

# THE INTERNATIONAL JOURNAL OF HUMANITIES & SOCIAL STUDIES

## Causes of Traffic Congestion and Possible Solutions along Akesan-Igando Road, Lagos Nigeria

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### **Abstract:**

Many urban cities in Nigeria are bedeviled with traffic congestion which tends to defy various remedial measures adopted by different governments over the years. Journey times from one point to another within a town have remained unreliable and residents have continued to face disturbing inconveniences in transportation especially traffic congestion. This study, therefore, addresses the problems of traffic congestion impacts on commuters along Akesan-Igando road. The set objectives includes: identifying pattern of traffic congestion at the Corridor, ascertaining the cause(s) of traffic congestion, determine what can be done to reduce traffic congestion in the study area. Basically, primary data was used for the research through direct observation, interview and field measurement. Drones were also deployed to capture images from the field. It was discovered from the field that the causes of traffic congestion along this corridor include: narrow road conditions, increase in population leading to increase in vehicle ownership, activities of road traders, illegal parking and poor enforcement. The study recommended that there should be proper and adequate enlightenment for the drivers on the dangers inherent in congestion, the law enforcement agencies (Police and LASTMA) should be motivated in order to act professionally and not to take bribe from public bus drivers, street trader should be completely banned from displaying their wares on the set back which impedes the free flow of vehicular movement, the state government should intensify effort to ensure BRT is operational on this corridor and there is need for improved traffic management system and of the road condition along the corridor.

**Keywords:** Congestion, corridor, commuters, journey and traffic

### **1. Introduction**

Traffic congestion occurs when a city's road network is unable to accommodate the volume of traffic that uses it. This situation is caused by rapid growth in motorization and with less than corresponding improvement in the road network, traffic management techniques and related transport facilities. Thus, traffic congestion is a phenomenon that is associated with urban environment all over the world. This is because we need transport to move from one place to another, especially when walking becomes inefficient. While traffic congestion has been managed very well in some developed countries, it has continued to defy solutions in the developing world. The forecast of Global Traffic Volume (GTV) shows that the phenomenon would double between 1990 and year 2020 and again by 2050 (Engwicht, 1992). This type of growth pattern, as envisaged by the end of year 2020 and 2050, is an indication of what the future congestions portends for people living in urban environment.

Many urban centers in Nigeria suffer from inadequate facilities that could ensure smooth urban movement. This is because the rapid growth of cities anywhere in the world has impact not only for the land use but also for the spatial expansion. The increase in commuting distance has impact on trip attraction, fares paid by commuters and traffic build-up in some land use areas. It also shows the need for different modes of transportation. Thus, a number of factors have been found to influence trip generation, attraction and distribution in any urban environment. Some land use types constitute nodes of desires and fulfillment in any urban area. Transport assists to even out the spatial imbalance in needs. Often, coincidence arises from individual commuter's journey during peak hour periods. This type of coincidence, if not well managed, may lead to traffic crisis that makes traveling burdensome in addition to wasting man-hour productive time.

Ways of mitigating this mobility problem and ensuring a smooth flow of urban traffic have been carried out in different studies as exemplified by the work of urban transport scholars. Some of the researches by these scholars were aimed at identifying the causes and dimensions of transport problems (Adeniyi, 1983; Aderamo, 1990 and Bello, 1993).

Others were pre-occupied with various options for solving transport problems (Ogunsanya, 1987; Omiunu, 1988; Bolade, 1989 and Ameyan, 1996). So far, the conventional approaches to traffic management have not been able to make the desired impact, judging from the traffic congestion patterns in Nigerian cities.

This study concentrated its effort on the sudden traffic congestion along Akesan-Igandocorridor in Alimosho LGA of Lagos State.

Before now, there were no traffic on this corridor but evidence showed that the on-going construction along Lagos Badagry has caused the diversion of motorist to this axis leading to more vehicles and ultimately the current everyday traffic along Akesan-Igando road. The Igando-Ikotun has been frequently used as alternative route to Oshodi (which is faster) instead of waiting endlessly in traffic at Mile 2- Iyana Iba Road. This might be some of the reasons the daily traffic congestion. This study is aimed at examining the causes of incessant traffic congestion along Akesan-Igando corridor and suggest possible solutions to it.

## 2. Aim and Objectives of the Study

The aim of this research is to identify the causes of traffic congestion in the study area. In line with aim of the study, the following specific objectives were addressed by this paper: to

- Identify pattern of traffic congestion in the study area; and
- Ascertain the cause(s) of traffic congestion in the study area

## 3. Scope and Limitations of the Study

The scope of this study is limited to Igando- Akesanbusstops in Alimosho L.G.A..Lagos and its impact on the residence in terms of travel time and fuel consumption, and condition of on-street parking management in particular.

The limitations of the study consists:

- *Specific Time Period:* Since there is a continual movement of vehicles in a road. The basic study and observation happens for certain periods and point of time. Like peak hour (office hour) and normal hour. So there may be different traffic pressure at other time periods.
- *Specific Designation/Number:* This research is basically a descriptive study, hence, the researcher used observation, field measurement and interview. The information provided by different designation may vary so he can only include few numbers of people from large designation of traffic officials, so it may not give accurate information.

## 4. Description of the Study Area

Lagos state is one of the smallest of the 36 states in Nigeria, located on south-western corner along the narrow elongated coastal flood plain spanning the Guinea coast of the Atlantic Ocean for over 180km, from the republic of Benin on the west to its boundary with Ogun State in the east (Online Nigeria, 2003). Lagos state lies approximately from latitude 6 02' North, to 6 04' North; and from longitude 2 0 45' East to 4 020' East. The state have one of the largest urban agglomerations, with explosive growth rate of 5.7 per cent annually; growing 2,000 inhabitants averagely daily, which translates into population growth of about 275,000 persons annually; and a population density of 2,594 persons per sq. km. The state's population is currently estimated around 21 million inhabitants (Lagos State Government, 2008; Un-Habitat, 2008, cited in LURG, 2009; Fashola, 2012, cited in Daily Independent, 2012).

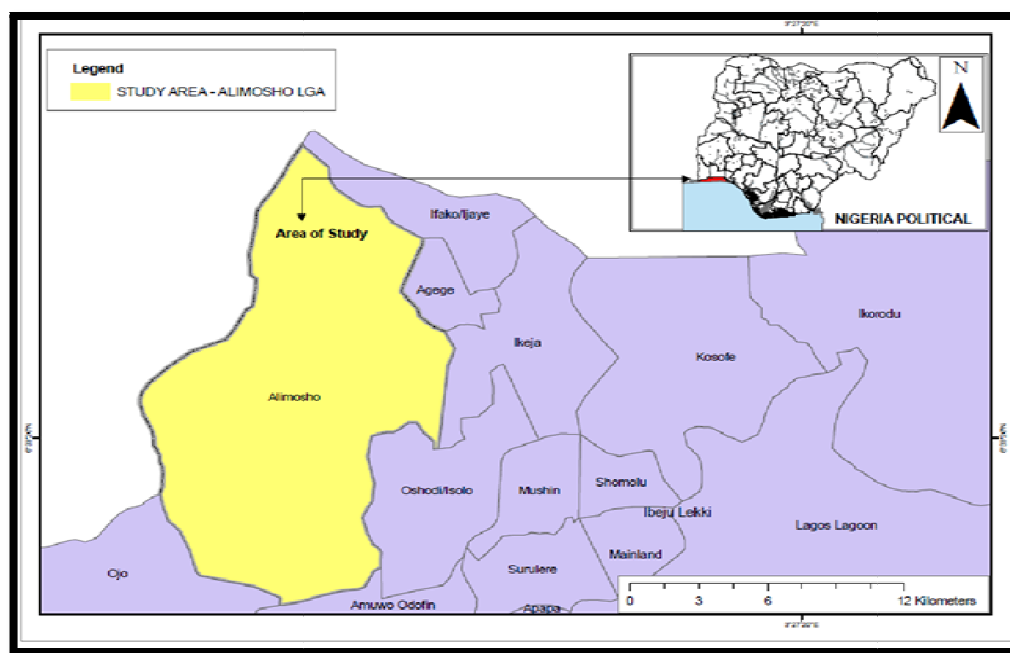


Figure 1: Showing the Study Area

Source: Online

## 5. Theoretical Framework

### 5.1. Queuing Theory

Queuing theory is the mathematical study of the congestion and delays of waiting in line. Queuing theory (or 'queueing theory') examines every component of waiting in line to be served, including the arrival process, service process, number of servers, number of system places, and the number of customers which might be people, data packets, cars, etc.

At its most elementary level, queuing theory involves the analysis of arrivals at a facility, such as a bank or fast-food restaurant, then the service requirements of that facility, e.g., tellers or attendants in restaurant, fuel stations or even motorist in congested lanes.

The origin of queuing theory can be traced back to the early 1900s, found in a study of the Copenhagen telephone exchange by Agner Krarup Erlang, a Danish engineer, statistician and, mathematician. His work led to the Erlang theory of efficient networks and the field of telephone network analysis. Queuing theory as an operations management technique is commonly used to determine and streamline staffing needs, scheduling, and inventory, which helps improve overall customer service. It is often used by Six Sigma practitioners to improve processes. This theory however is relevant to this study.

## 6. Concept of Traffic Congestion

Owing to its ubiquitous occurrence, especially in cities across the world, various academic disciplines, such as geography, economics, planning, computer applications and engineering have given tremendous attention to the subject of traffic congestion. The greater part of the current literature, however, seems to be concentrated on issues like modelling traffic dynamics (Chevallier, Can, Nadj, & Leclercq, 2009); modelling traffic flow (Cho, Quek, Seah, & Chong, 2009); and visual based traffic monitoring system (Wang & Ruskin, 2002).

It has been argued, and rightly so, that 'traffic congestion presents a common if not inevitable facet of traffic activity in a region, particularly in urban areas' (Taylor, Woolley & Zito, 2000). Although this phenomenon is human-induced and it is seen as an integral element in any transport system all over the world, a unanimous definition has defied scholars.

According to The Joint Transport Research Centre (2007) of the Organisation for Economic Cooperation and Development (OECD) and the European Conference of Ministers of Transport (ECMT), traffic congestion 'is a situation in which demand for road space exceeds supply; impedance vehicles impose on each other, due to the speed-flow relationship in conditions where the use of a transport system approaches capacity; and a relative phenomenon that is linked to the difference between the roadway system performance that users expect and how the system actually performs'. The Federal Highway Administration (FHWA) in Nigeria defines congestion as the level of system performance may vary by type of transportation facility, geographic location (metropolitan area or sub-area, rural area), and/or time of day,' in addition to other variations by event or season. Ukpata and Etika (2012) point out that traffic congestion is as a result of the increasing growth in motor vehicles without a corresponding improvement in transport facilities such as road network, traffic management techniques.

Aderamo (2012), in his study asserts that congestion occurs when transport demand exceeds transport supply at a specific point in time and in a specific section of the transport systems. Under such circumstances each vehicle impairs the mobility of others. Aderamo (2002) submitted that congestion is a common feature of most urban centres of Nigeria

and most especially Lagos, Ibadan, Port Harcourt, Enugu and others which are commercial and industrial nerve centres of the country, having the most problems.

### 6.1. Causes of Traffic Congestion in Lagos Metropolis

Many factors contribute to traffic congestion in Lagos metropolis, some of which are obvious to the general public. The factors include:

- Social and economic factors.
- Road Factors (including design and control).
- Vehicle Factors.
- Human Factors.
- Accident Factors

#### 6.1.1. Social and Economic Factors

Many of the causes of traffic congestion in Lagos metropolis can be attributable to inadequate spatial planning to take care of rising population occasioned by migration from rural areas to the cities, unplanned land use such as concentration of offices within particular areas, which impedes traffic flow especially during peak hours, increased car ownership due to improved standard of living and inadequate public transport.

#### 6.1.2. Road Factors

Inadequate and unmaintained drainage facilities result to frequent flooding and blockage of traffic lanes. This slows down vehicle movement, which may lead to mechanical breakdown and accidents. Contributing to traffic congestion in Lagos and in the study, is the unregulated double and on-the-road parking of vehicles along the roads thereby creating bottlenecks on the roads.

#### 6.1.3. Vehicle Factors

The characteristics and performance capabilities of motor vehicles to a large extent determine the nature of traffic flow and safety. The weight of vehicles such as trailers and tankers often constitute problems. The weight of vehicles exceed the structural design standard of the roads thereby overstressing them. Breakdown of some vehicles as a result of break failures, and bursting of tyres, threaten free flow of traffic in Lagos metropolis and the study area.

#### 6.1.4. Human Factors

Human beings (drivers, pedestrians, and cyclists) are prime elements in highway traffic. Individual behaviour in traffic stream is a factor which establishes the characteristics of traffic. Very often, traffic congestion in the city is caused by vehicle drivers especially commercial vehicle drivers. There are also sections of major roads that are cut by residents connecting water to their houses or business premises without patching up the road on completion. Some vehicles in Lagos metropolis and study area have mechanical problems and move at snail speed causing traffic congestion.

#### 6.1.5. Accident Factors

Occurrence of accidents causes traffic congestion. At the scene of accident, queues develop in both directions of traffic as a result of lack of immediate settlement by the parties concerned or inability to remove broken down vehicles from the road immediately the accident occurs.

## 7. Empirical Studies

Joshua, Abdul-Azeez, Oyedokun, and Jonathan (2009), examines the causes, effects and possible measures of road traffic congestion in some selected areas of Lagos State. According to their study, there are many factors contributing to the traffic chaos in Lagos State, mostly:

- Social and economic factors: Land-use of Lagos is poor, like most offices are concentrated at its Island that affects the travel direction- one or the same direction during the peak hours, and also inadequate public transport system are the main factors.
- Road factors (including design and control): From many factors, they stated that the most obvious cause of traffic congestion in Lagos is the condition of the roads and other interrelated elements. Most roads, are highly crowded, particularly the feeder, as a result, traffic increases up that build queue from these feeders that uses for exits and entrance to the main roads. This is because roads are too narrow and lack of sidewalks that hinder the free movements of vehicles particularly when another vehicle passes from the opposite direction, and pedestrian sharing traffic lanes. The situation is aggravated by unregulated on-street parking on the already too narrow streets.
- Vehicle factors: Even if it is expected that the standard of vehicles to fit the geometric standards stated by law, most motor vehicles' length, width and height are not fit with road standards.
- Accident factors: Irresponsive traffic management in removing disabled vehicles immediately and of lack of immediate settlement by the parties in the case of more serious accident cause queues in both directions of traffic.

Therefore, the study concluded that poor road condition, accident, absence of integrated transport system, and inadequate traffic planning were the major causes of traffic congestion in Lagos State. Lastly, based on its findings, the study suggested some mitigation strategies for congestion, like- enhanced transport coordination, road capacity expansion

(junction improvement and separate lanes for specific user groups- public buses and emergency), and demand management (parking restriction, park and ride, congestion pricing, and incentives to use public transport).

## 8. Research Methods

Basically, this research adopted primary source of data which are direct observation and interview. Due to the nature of the research, the study carried out an in-situ assessment of the probable cause(s) of traffic congestion along this corridor. Drones were also employed to take an aerial view of traffic situation along the study area while some of the drivers, road users and law enforcement agencies were also interviewed to know possible ways this menace can be curbed.

The population under study in this study consists of motorist, transit riders, commuters and enforcement agencies along Akesan-Igando corridor.

## 9. Discussion of Findings

This findings of this study revealed that traffic congestion along this corridor occurs due Akesan- Igandoto narrow roads/road condition, the lack of implementation of traffic rules, negligence and traffic discipline/ lane discipline leads to traffic congestion, increased population in the area, beggars occupying the median, on street trading, illegal parking and one way syndrome. The finding is consistent with study of Olaogbebikan, Ikpechukwu, Akinsulire and Enosko (2013) who identified inter alia the traffic congestion causative factors as; over dependency on small occupancy vehicles, narrow road, indiscriminate parking, loading and off-loading of goods and passengers on the road, on-street trading, inability of the traffic management agencies to evacuate crashed or breakdown vehicles on time and ineffective traffic control measure.



*Figure 2: An Aerial View of Traffic Congestion at the Study Area*  
*Source: Authors Research Work (2021)*

Figure 2 shows the aerial view of the study area. It was observed that there are influxes of vehicles joining the main road from the arterial. This automatically put more pressure on the main corridor thereby leading to congestion. As observed, most of the commercial drivers are sometimes impatient and may want to force their way into the main road without proper excuses or plead. This sometime leads to vehicle scratching and attention of policemen may be needed before both parties could be settled.



*Figure 3: Traffic Congestion as a Result of Unavailability of Enforcement Agencies*  
*Source: Authors Research Work (2021)*

Traffic congestion is always rampant along locations where there are no enforcement agencies such as policemen, LASTMA, and FRSC officers. As seen in figure 3, the traffic was as a result of the turning at the Igando bus stop and there were no traffic officers to control the traffic as at the time of the report. It was observed that the presence of traffic officers put some sanity to an extent to the behaviour of drivers whether private or commercial.



*Figure 4: Traffic Congestion Caused by Unregulated Yellow Buses in the Study Area*  
*Source: Authors Research Work (2021)*

Figure 4 shows traffic congestion caused by unregulated yellow buses. As seen in the picture, the yellow buses park indiscriminately to pick passengers at the middle of the road not minding other road users. This act is rampant in the study area and sometimes the policemen encourage this upon collecting some cash from the drivers.



*Figure 5: Traffic Congestion Caused by Pedestrian Crossing at the Study Area*  
*Source: Authors Research Work (2021)*

Pedestrians are also part of road users and there is need for drivers to slow down whenever they want to cross the road. The frequent stopping and moving also contributes to traffic congestion in the study area. Igando is a popular bus stops where several road users meet daily in order to connect to other route such as Egan, Ikotun and Oshodi. When there is influx of these pedestrians, all drivers must therefore be careful in order not to knock down a pedestrian. Hence, the traffic often witnessed.



*Figure 6: Traffic Congestion Caused by Road Side Market*  
*Source: Authors Research Work (2021)*

From the field research, it was observed that road side markets are part of the cause of congestion in the study area as seen in figure 6. The lanes are being reduced from three to two by the traders and yet so many people patronize these traders. In an attempt not to hit the traders or buyer, the resultant effects are the traffic congestion causes at this corridor.





*Figure 7: Traffic Congestion Caused Due to Narrow Road in the Study Area*  
*Source: Authors Research Work (2021)*

It was also observed that the reason why there is now recurrent traffic congestion along this corridor is the nature of the road. The roads are so narrow at some places that it only accommodates two vehicles at a time. The implication of this is that once there is a break down as a result of either a mechanical fault or an accident, it becomes more problematic for other road users as it would eventually leads to congestion



*Figure 8: Traffic Congestion as a Result of Influx of Motorcycles*  
*Source: Authors Research Work (2021)*

Motorcycles are gradually taken over as an alternative to commercial bus in the state. As seen in plates 7, there are influxes of motorcycle in the study area in which motorist are well careful in order not to hit the unregulated motorcyclist. Many of these motorcycle riders don't make use of the garages built for them but rather, they come to the express to pick passengers at will and sometimes form other illegal garages on the road thereby reducing the road lanes for other road users.



*Figure 9: Traffic Congestion Due to Poor Public Transport System*  
*Source: Authors Research Work (2021)*

It was also observed that one of the reasons for traffic congestion along this corridor is the absence of an organised public transport system. Figure 9 shows how unregulated and disorganized natures of the yellow commercial buses are. One thing is certain, and that is if there are BRT buses and a dedicated lane for it on this corridor it would reduce the number of yellow buses and this would ultimately reduce the congestion.



Figure 10: Traffic Congestion at the Study Area with the Presence of LASTMA Officers  
Source: Authors Research Work (2021)

Figure 10 shows some LASTMA officers controlling traffic at the study area. Despite their presence, traffic congestion still persists. This simply implies that if all other factors causing traffic congestion are not looked into, there is little or nothing law enforcement agents could do to address traffic situation at any point. Although their presence helps to improve the free flow of traffic in the state.

## 9. Summary of Findings

Traffic congestion is the phenomenon of increased disruption of traffic movement on an element of the transport system, observed in terms of delays and queuing that is generated by the interactions amongst the flow units in a traffic stream or in intersecting traffic streams. The phenomenon is most visible when the level of demand for movement approaches or exceeds the present capacity of the element and the best indicator of the occurrence of congestion is the presence of queues. There are three types of traffic congestion such as recurrent, non-recurrent congestion and the pre-congestion state. These were categorized into two factors; that is finite capacity and stochastic character. These types are based upon the frequency and predictability of the congestion - factors which will impact on driver behaviour. The occurrence of congestion in all transportation facilities may be accounted for by three features that characterise travel demand and supply. However, from the observation made, the following findings were noticeable as causes of traffic congestion along this corridor.

### 9.1. Poor Planning

Many of the causes of traffic congestion in Lagos metropolis can be attributable to inadequate spatial planning to take care of rising population occasioned by migration from rural areas to the cities, unplanned land use such as concentration of offices within particular areas, which impedes traffic flow especially during peak hours, increased car ownership due to improved standard of living and inadequate public transport. This was noticed at Igando bus stop. The junction leading to Oshodi via Ikotun is actually causing a lot of traffic as the drivers going straight to Isheri need to exercise patience until they are able to escape that junction. The two lanes turn to a single lane and the resultant effects is the bottleneck.

### 9.2. Narrow Road Capacity

This road can only take two vehicles at a time meaning it is a dual carriage capacity road. Once there is a breakdown of any vehicle, or an accident occurs, it will lead to reduction of the road capacity from two lanes to one thereby causing slow movement of vehicle. Contributing to traffic congestion in the study area again is the unregulated double lane parking of vehicles along the roadway thereby creating bottlenecks.

### 9.3. Road Users Behaviour

Human beings (drivers, pedestrians, and cyclists) are prime elements in highway traffic. Individual behaviour in traffic stream is a factor which establishes the characteristics of traffic. Very often, traffic congestion in the city is caused by vehicle drivers especially commercial vehicle drivers. They drive recklessly and also park indiscriminately. Another factor that can be attributed to traffic congestion on this corridor is '**one way syndrome**' this is a situation where a driver leaves his original lane facing an oncoming vehicle due to impatience. This act tends to block the other side of the road leading to total lockdown. This was observed in the study area as most commercial vehicles pull out from Akesan and use one way to get to Igando on a breath-taking speed.

### 9.3. Accident Factors

Occurrence of accidents causes traffic congestion. At the scene of accident, queues develop in both directions of traffic as a result of lack of immediate agreement by the parties concerned or inability to remove broken down vehicles from the road immediately the accident occurs. Although this is not a recurrent factor but it was also observed in the study area that before the case of an accident is settled, the police must come to identify who is at fault thereby causing unnecessary delay for other motorists.



#### 9.4. Poor Enforcement

Although there are pockets of law enforcement agents such as policemen and Lagos State Transport Management Authority (LASTMA) official along this corridor but as a result of indiscipline and bribery, they sometimes ignored what is right and rather collect bribe from motorist so that they can load or wait to drop passengers. This act also contributes to traffic congestion along this corridor.

#### 9.5. Influx of Motorcycles and Tricycles

There is influx of motor cycle (okada) in the study area. These okada and tricycle riders park very close to the road blocking the road passage, sometimes they drive in one way and pick passengers anywhere.

#### 9.6. Other Factors

There are other factors such as hawking, beggars' and pedestrian crossing the road. Motorists are being careful not to knock down any of these road users. As noticed in the study area, there are a lot of beggars occupying the road median and sometime run after vehicles to beg for alms. Also, there are cases of young underage children running after vehicle to wash them regardless if the owner wants it washed or not. All these factors contribute one way or the other to slowing down of vehicles ultimately leading to traffic congestion.

### 10. Conclusion

Following the findings of the study, the study concludes that traffic congestion is a problem and the problems manifest when measure in terms of delays, which can be defined as the time lost by vehicle due to traffic friction that are likely to be caused by other vehicle's inefficiencies or ineffectiveness as in the case of breakdowns, accidents, parking and manoeuvring problems.

### 11. Recommendations

In reaction to reducing the problems of traffic congestion in Lagos metropolis and along the corridor, the following suggestions are proffered:

- There is need for improved traffic management system and of the road condition along the corridor and the city in general. Channelizing devices or traffic control devices should be installed especially at the junctions to aid flow as traffic wardens judgement is inaccurate.
- The flextime work schedule should be encouraged which allow different working time for daily people work. For example, 8am-4pm, 10am-6pm and 12noon-8pm and so on will improve the current uni-directional travel demand.
- Intelligent transportation systems should be promoted. intelligent transportation systems include the application of a wide range of new technologies, including traffic reporting via radio or possibly mobile phones, parking guidance and information, automated highway systems, traffic counters, navigation systems, and transit improvement. These can provide great reduction in congestion as well as variety of transportation improvements. This will also help during accidents and emergencies.
- There should be proper and adequate enlightenment for the drivers on the dangers inherent in congestion and also dissuading them from certain congestion-causing habit such as wrong overtaking, one way driving, disobey of traffic signals and traffic wardens.
- The law enforcement agencies (Police and LASTMA) should be motivated in other to act professionally and not to take bribe from public bus drivers.
- The street trader should be completely banned from displaying their wares on the set back which impedes the free flow of vehicular movement.
- The state government should enact a law to ban the underage children running after moving vehicle in order to wash them for a token.
- The activities of motorcycles and tricycles should be restricted and law enforcement agencies should be empowered to impound any tricycle or motorcycle who fails to comply with the new laws.
- The state government should intensify effort to ensure BRT is operational on this corridor. This will reduce the number of private car usage on the corridor.
- Water transportation is also recommended as an alternative to road mode. This will reduce the pressure on the road infrastructure along this corridor.

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