

NEW INFRASTRUCTURES IN ENHANCING MOBILITY IN THE CITY OF NAIROBI

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Purpose: The main aim of this paper is to show how the new, especially the current development in infrastructure in the urban setup, in this case, the capital city of Kenya, Nairobi, improves the movement within the city. Furthermore, it also examines the various ways in which these new infrastructures have improved or improved the quality of life of the city residents.

Design/methodology/approach: Nairobi city was chosen as it is the biggest and largest city in east and central Africa. The literature theories used in this paper were gathered from various internet sources such as the website of Nairobi city authority and also from the website of different media companies. In addition to these, some literature sources and books were also used to gather information for the paper as well as audio-visual sources like YouTube. Personal experience about the country and the city was also used as the author comes from the country and the city being talked about in this paper.

Findings: The outcome of this theoretical paper was that indeed the efficient mobility within a city depends on how well the infrastructures are efficient. These include transport, technology, environmental and social infrastructures. These infrastructures help to improve mobility to a higher level as compared to the previous ones. The new ones being implemented by the city authorities and the central government play a crucial role in improving the living standard of the city residents by easy and efficient movement within the city. The new infrastructures range from physical infrastructures, technologies, the organization to the management of the whole city as all must be combined for efficient mobility.

Originality/value: This article deals with how the new infrastructures help in improving mobility within urban settings especially in a developing world like Kenya. It also looks at the past, current, and future plans for the city's infrastructural development to enhance mobility. These also include the political, social, and economic will of the authorities concerned.

Keywords: Mobility, infrastructure, quality, Nairobi city.

Category of the paper: A literature review.

1. Introduction

Nairobi is the largest and most developed city in east and central Africa. It is also the financial and logistics hub in that region. It is the headquarter of many global organizations such as UNEP(United Nations Environment Program). As the capital city of Kenya, it is the main place of employment where everyone would like to live and work especially after graduating from the educational institutions. As a result of all these, the mobility infrastructures of the city together with the social amenities become under intense pressure from the faster-growing population. Being an important city in the region and with the modernity, the population has trooped into the city over the years hence there was to improve and develop new infrastructures to cater for the demands. Mobility infrastructures in any place on earth are always one of the most expensive investments countries do make.

Most of the mobility infrastructures under the pressure of the growing population were designed in the 1960s to accommodate a smaller population of less than a million which has currently increased to more than 4.4 million considering the visitors of the city. An increase in population together with the rise in the economic development of Nairobi led to more demand for transportation. This led to the increase in the number of buses, cars, and vans on the road. Meanwhile, the commuter train started to break down due to poor services hence putting more pressure on the existing road infrastructures. All these were happening while the existing mobility infrastructures remained unchanged. As a result, serious traffic jams started to emerge in Nairobi and got worse as time passes by. These problems could not make the city smart in terms of mobility thus the demand for proper modern development in transport infrastructures.

The following are some of the challenges the city faces today: managing growth, reducing traffic, creating sustainable development, making smart transportation, and many others. New urban infrastructure is a development strategy by the cities to combat the above challenges by creating city communities that are livable, walkable, and sustainable while increasing the quality of life. (Kemp & Stephani, 2015). The current form of growth, outward expansion development, and constant increased need for more transportation capacity threaten the quality of life as passengers spend more time in their cars and buses and the quality of the environment as more carbon gas is emitted by the stationary vehicles. This problem of traffic is quite serious and has reached a dangerous level as mobility and quality of life within the city has decreased. The occurrence of these problems within the city betrays plans for having a smart city with smart mobility as the aim of being smart is to improve the quality of life. In Nairobi, nearly everyone agrees that traffic congestion is one of the top quality of life complaints apart from unemployment. Within the city itself, the noise from the vehicles and the touts, the thick smoke (as no serious regulation for exhaust fumes from the vehicles) produced by the congested vehicles and the dust caused by the same vehicles are constant daily environmental problems faced by the city community. The combustion of petrol and diesel by engines gives the following emissions: carbon monoxide, carbon dioxide, hydrocarbons, nitric oxides, some sulphur oxides which are present in the exhaust gases from the fuels containing sulphur (Low

& Gleeson, 2003). These exhaust gases accelerate the greenhouse effects and have effects on the health of the city residents thus, reducing the quality of life in the city. As it is known that a city living on total automotive dependence becomes dysfunctional, inefficient and inconvenient for life. The goal of the transport system is to move people, not vehicles or trains (UNECE, 2020).

Therefore, there is a need to develop new transport infrastructures that will give the city convenience, reliability, comfort, speed and safety it needs to enhance mobility.

2. Mobility in Nairobi

At the beginning of the development of the city in the 19th century, the most common means of transport has been vans, trucks, buses, bicycles and motorcycles. By that time, the population was low and commuting time was short and efficient because of less traffic. In the 1960s, the mode of transport within Nairobi were private vehicles, buses and public service vehicles which were mainly transporting passengers from the city suburbs to the city center where many offices were located and to the industrial area of Nairobi for workers. Towards the mid-1960s, privately-owned vans known as ‘matatu’ started to ferry passengers (Sclar & Alexander, 2007). Initially, they were illegal and popular because they were charging cheap fares. Currently, they are the dominant means of transport within Nairobi where and other major cities (Salon & Gulyani, 2019). Since then, the authorities accepted and gave them the license to do transport business.

The Matatu has a formal and informal extensive network covering a large geographical area within Nairobi. Some buses offer an alternative to Matatus. Most bus routes converge at the city center from the suburbs. They have terminals within the city center which they use. The commuter train operated by the Kenya Railway corporation was also being used to transport passengers within the city. Even though it did not have an extensive rail network, the rail routes it plied were the cheapest of all the means of transport. Currently, the city authority has brought a light-rail system operated as Nairobi Commuter Rail Service to use the existing rail route to improve the transport mobility within Nairobi.

Another common means of transport within Nairobi is the use of taxis. They have designated terminals. With the improvement of technology, there are currently many taxis application and car-sharing mobile applications which most experts preferred. The global one, Uber, is also available. The use of motorcycles to transport passengers has become a great force in the transport industry in Nairobi since motorcycles are not prone to traffic snarl-ups within Nairobi. The use of personal cars is also common especially for those who can afford to buy. Cycling is also gaining popularity even though it is the most underutilized mode of transport. Surprisingly, the majority still prefer walking especially those who live adjacent to the central business district.

Table 1.

The table shows the distribution of use of major means of transport in Nairobi

Mode	Percentage (%)
Public Service Vehicle (PSV)	29
Private Vehicles	15
Motorcycles	6
Train	1
Walking	47
Others	1

3. Mobility Problem in Nairobi

In any urban center, the efficiency and availability of transport is always a major factor in the development of urban centers, especially cities. In Nairobi city, the urban mobility transport is usually characterized by congestion, environmental pollution (noise, smoke and dust), less route network, accessibility, poor demand management, poor safety, insecurity, bad fare policy, worn out and inadequate transport and mobility infrastructures, management and institutional problems and ignorance to quality need (Aligula.E.M, et al., 2005). In 2004, when the new traffic law came to force and was being implemented, the matatu (public service vehicles) operators went on strike protesting the new regulation despite the residents having more expectations that the traffic congestion and chaos in the city transport sector would be over. The congestion in Nairobi increased so rapidly. This problem of public transport in Nairobi shows a significant challenge in respect to ensuring the mobility of the city residents. Furthermore, this challenge affects the ability of the private sector to create more jobs for the city population.

The mobility system in Nairobi generally has unending problems such as high demand gap, expensive fares, high road traffic accidents rates, pollution and unregulated policies. These problems manifest themselves, especially during rush hours. With no proper network planning, the vehicles jammed the road hence worst traffic congestion begins. A journey that would generally take 30 minutes ends up taking two hours because of traffic jams. A productive time is wasted on the traffic alone as people and vehicles spend more time on the road. According to a local newspaper (2021), it was reported that time wasted in those traffic jams cost the city Kenyan shilling 100 billion (approximately \$1 billion) every year. The Nairobi Metropolitan Area Transport Authority ranked the city as the fourth congested city globally. This is not good at all for any economy. It is this loss of money that prompted the government and Nairobi city authorities to come up with measures to save the city's economy. Therefore, numerous projects were proposed to find a long-term solution. Some of the projects have been completed, some are still ongoing while others are still in the planning stages.

4. New Mobility Infrastructures in Nairobi

4.1. Nairobi Expressway

It is one of the most decorated urban mobility projects in Nairobi city. It is a 27 km long road linking Mlolongo Town in the Machakos county and Jomo Kenyatta International Airport to the Nairobi Nakuru highway and also the city center. The project aimed to ease the traffic between the central business district of the city to the suburbs. Normally driving along this road especially during rush hours, early morning and evening, was taking almost two hours. But currently, it will take you 20 minutes to drive through. Some features have been incorporated to ensure faster movement of vehicles unlike before such as elevation of parts of the road and dual carriage. The project was started in 2020 and is expected to be officially open in April 2022 at a cost of approximately 487 million euros. It has a toll charge to recover the money invested in it since it is a public-private partnership project (Kenya National Highway Authority, n.d.).

4.2. Nairobi Western Bypass

The highway starts in Wangige and Ndederu then finally terminates at Ruaka on the Western side of the city. It is a dual carriage highway of about 32 km in length. It involves the construction of feeder roads, flyovers, and interchanges. When completed, it will ease the traffic congestion around the city. This will enhance faster mobility between the city center and its environment. The constructions which also involve pedestrians and cycle paths, will ensure safety for all, pedestrians and other non-motorized users and enhance a smooth flow of traffic. In combination with the project, a bus terminus is also being constructed in Wangige which will ensure public transport efficiency and reduce unnecessary traffic disruptions (Mulyungi, 2021).

4.3. Green Park Bus Terminus

It is a bus terminus constructed by the Nairobi Metropolitan Services. It is called green because of its greenery and the use of renewable energy since it is being powered by solar energy. Going green is always the best in terms of renewable energy use. The green parking lots involve capital a capital costs for related infrastructure but later the fuel used is free and plenty(sun) (Verma & Ranjan, 2019). The green park can also be used for recharging the electric buses in the future as diesel-powered buses will be faced out. It aims to decongest the city center which has been crowded by the public service vehicles transporting people around the city. Since many of the vehicles don't have a designated terminus, they have caused huge congestion within the city. By using the Green Park Terminus, more spaces will be available for quick mobility within the city and this has to lead the authorities to construct the cycling paths for the first time in the city. In addition to hosting the public service vehicles, the green terminus has a dispensary, police station, mini supermarket, and other stores.

4.4 Nairobi Commuter Rail Service

It is the use of diesel trains to transport Nairobi residents. The project was realized in 2020 by the president. It uses the existing rail network which was used by the old trains. The new multiple diesel trains in Nairobi are second-hand trains bought from Spain's Mallorcan Railway Services (SFM) (Cuenca, 2021). to help in modernizing the transport system within Nairobi to enhance mobility. In 2020, 13000 passengers used the service daily. This is a big improvement considering that in the previous few years nobody used the old trains. Though the rail system is not widespread across the city, people who live along the routes they are plying currently prefer to use them. The commuter trains have the advantage over other means since they experience no traffic problem unless a very rare breakdown. They have become the most reliable means of transport within Nairobi, especially along their routes. Due to this, the Kenya Railways Corporation is aiming to create a transit-oriented development to support ridership for commuter rail (Kenya Railways, n.d.). This urban rail system gives higher capacity access than the buses, matatu, or private cars with less environmental damage and less demand for land devoted to transport to develop highways and parking spaces (Simpson & Barry, 1994).

4.5 E-Payment (e-jijipay or ejijipay) System for Parking

“Jiji” means city in the Swahili language. Ejijipay is an electronic payment system Nairobi city residents are using to pay for services offered by the Nairobi City Authority such as parking fees, single business permit, rent, city bills, food handlers, land rates, and many other bills. The payment can be done through the Ejijipayment app, website, or through mobile phone number registration where the payment is done through the mobile money account call M-Pesa (“Pesa” means the money in Swahili and “M” for mobile) (Wikipedia, 2021). The payment system has several benefits for the city authority such as:

- Easy to pay as one does not need internet hence saving motorists time spent on looking for the parking machine or parking attendant.
- It saves time as one can pay while still in the car.
- It helps to prevent congestion caused by the delay in payment hence ensuring smooth and faster mobility in the city.
- Helps to improve the revenue collection as money goes directly into the account of the city authority.
- It prevents corruption as previously the motorists used to bribe the park accountant by paying fewer fees.

5. Conclusion

Like any other developing country, Nairobi has a big transport problem. It lacks an integrated public transport system that has led to congestion, road accidents, and pollution of the environment (Dixon & Labuschagne, 2018). The city authority and the government acknowledge these problems and that is the reason for the development of the above projects as one of the solutions. There are also other planned projects such as Bus Rapid Transport for mass transportation of the passengers rather than the small vans and mini buses (Mueni, 2019). There is more to be done to realize the full potential of efficient mobility within the city. Some simple infrastructure improvements would help make the public transport work better in Nairobi (Gordon, 2011). With the advancement of technology, more technological solutions will be found to promote the quality of life of the city residents through reliable and efficient transport. There is also a need for enacting proper transport policies in the favour of an efficient transport system followed by strict enforcement. It has also been observed that investments in transport infrastructure such as highways, rail, mass transit, ports, and airports, increase the accessibility, economic, environmental and social impacts (Joseph, 2005). To reduce the pollution caused by the diesel-powered vehicles within the city, energy and fuelling infrastructure and the operation of vehicles powered by alternative energy carriers for public transport using technology-based solutions for the city traffic and transport management supporting the reduction of energy consumption and emission should be implemented by all the stakeholders (European Commission, 2012).

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