

## ADOPTION OF BUS RAPID TRANSIT AS AN ALTERNATIVE MEANS OF REDUCING CONGESTION AND ECONOMIC DEVELOPMENT IN TANZANIA: A CASE STUDY OF DAR ES SALAAM CITY IN TANZANIA

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### ABSTRACT

*Traffic congestion has been evident in Dar es Salaam and other cities in Africa and, has mainly been contributed by the gap in the level of socio-economic development due to demographic pressure. Through this experience, workers in public and private sectors lose a great deal of their working hours to traffic jam which in turn affects the economy negatively. However, many studies on traffic congestion given in Tanzania focused mostly on poor land use management; poor transportation management and roads ineffectiveness, little is known on alternative economic viable solution. Given the utmost importance of transportation on the gross domestic product (GDP) growth; it is economically useful and of policy importance therefore to determine the consequences of traffic congestion on productivity. The rationale of the study is to persuade governments in Sub Saharan Africa especially those yet to adopt it, to turn on to Bus Rapid Transport system a far reaching public investment as an alternative solution for national interest. The study used meta-analysis approach on the methodology. The findings show that workers mobility towards centre business district (CBD) particularly during the peak hours is affected by traffic congestion, thus affecting labour productivity and consequently the economy. For that reason adoption of Bus Rapid Transport will restore the orderly flow in the transportation system while BRT users will do away with excessive delays; restore working hours and improve workers' productivity and eventually increase Sub Saharan countries' gross domestic product.*

**Keywords:** Transport, Traffic Congestion, BRT and workers' productivity

### INTRODUCTION

Developing countries have experienced huge population growth both in rural and urban areas in the last few decades (Roux, Del Mistro, & Mfinanga, 2011). For instance, urbanization growth rates for Kenya, Tanzania and Zimbabwe in the 1980s were 7.7%, 6.6% and 5.9% respectively (Barney, 2013). This growth in population is a result of a combination of both natural growth and rural urban migration. The impact of this growth in rural areas has been the supply of non-wage labour in agriculture and the growth of urban labour force. Understandably, in the next 40 years Africa will have the fastest growing cities in the world (JICA, 2013) and Kumar & Fanny (2008) shows it vividly that in 2000, one in three Africans lived in a city; by 2030, it is expected that one in two will live in the city.

Tanzania experienced a spurt in both population growth and urbanization in the two decades after independence. Thereafter, population growth still averaged nearly 3% p.a. while the urban population increased by about 5% p.a. As a consequence, urbanization increased from 5.7% in 1967 to 29.1% in 2012. Thus, of 31.6 million increase in the total population, 12.0 million were absorbed into urban area, (Wenban-Smith, 2014). Dar es Salaam stands out as the primate city, accommodating some 4.4 million people, equivalent to 10% of the national population (*ibid.*)

The aftermath of the population growth in urban areas, resulted into the increased demand for urban transport in many African cities. As there were less developed other alternatives transport modes such as railways and waterways, roads congestion became evident in cities. The problem is compounded on the fact that, public

transport which provides formal transport is done in collaboration between government and private a sector. Meanwhile, various governmental organizations and private companies run such transport for their staffs and businesses; privately owned transport such as cars, tracks and motorcycles share the same infrastructure. Roads become overcrowded and general transport conditions deteriorate.

In view of the above scenario, African cities demand effective transport systems for economic development. A good transport system is a strategic component of economic development and human well-being. Indeed, a good transport system is needed to support the mobility of people, goods and information of the growing urban population. Efficient transport systems provide economic and social opportunities and benefits that result in the positive multiplier effects such as better accessibility to markets, employment and additional investments.

It is worth noting that a substantial percentage of manufacturing industries in the African countries are located in the major urban centres. In Tanzania (UNIDO & URT, 2012) reported that industrial activity is largely concentrated in Dar es Salaam. In fact, more than half of large manufacturing establishments are located in Dar es Salaam and to a lesser extent in Arusha. About 14% is spread out between Mwanza, Singida, Tanga, Kagera and Kilimanjaro (*Ibid.*) In Zimbabwe for example, 90% of all the industrial and manufacturing industries in the country are located in the seven largest urban centres namely; Harare, Bulawayo, Chitungwiza, Mutare, Gweru, Kwekwe, Kadoma and Masvingo (Munzwa & Wellington, 2010).

Therefore this ascertains that there is close links that exist between efficient urban transport systems, productivity and growing gross domestic product (GDP); and subsequently limitations in the sector are expected to have tremendous negative consequences on the performance of workers and eventually in the national economy.

### **Definitions and Causes of Road Congestion**

Transport or transportability refers to the ease movement of passengers, freight or information from one location to another (Yu, 2008).

Transport infrastructure consists of fixed installations necessary for transport. It includes roads, railways, airways, waterways, canals and pipelines and terminals such as airports, railway stations, bus stations, warehouses, trucking terminals, refueling depots and seaports. Terminals may be used for both interchange of passengers and cargo and for maintenance (Rodrigue, Comtois, & Slack, 2013). Vehicles traveling on these networks may include automobiles, bicycles, buses, trains, trucks, helicopters, and aircraft. Hence, the transport system comprises of an infrastructure component and a service component. Human survival and societal interaction depend on the ability of people and goods and services. Efficient mobility systems are essential facilitators of economic development. Cities could not exist and global trade could not occur without systems to transport people and goods cheaply and efficiently (Ribeiro, Kobayashi, Beuthe, Gasca, Greene, Lee & Wit, 2007).

Overall, it is argued that, there is no single agreed definition of traffic congestion. According to (OECD, 2007) traffic congestion is both a physical and a relative phenomenon. As a physical phenomenon traffic congestion is a situation where demand for road space exceeds supply and is reflected by slower speed, longer trip times and increased motor vehicular queuing (Institute of Transport Engineers, 1989). As a relative phenomenon, traffic congestion is a difference between road performance and road user's expectations.

Any failure on the part of infrastructure component to accommodate vehicular flow may be as a result of an increase in the number of cars and number of people using cars, low capacity of transport infrastructure, road layout and under investment in road infrastructure. Other causes of urban road congestion include poor traffic management, shortage of street parking, signal and equipment failure, non-adherence to traffic regulations, poor urban planning or poor urban development control and poor public transport. An increased use of private cars, car accidents, special events gatherings, road works and bad weather can also result into urban road congestion (Aderamo, 2012)

Dar es Salaam Bus Rapid Transport ‘(DART)’ system is a Tanzanian government owned project which is a cost effective sustainable transportation system for Dar es Salaam City to ensure fast and orderly flow of traffic on urban streets and roads (URT, Dar Rapid Transit Agency, 2017). Other countries in Sub-Saharan Africa known for their excellent public transportation systems in the urban and cities include; Ethiopia ‘Addis Metro’, South Africa in Johannesburg ‘Mass Rapid Gautrain’ ,Lagos and Abuja in Nigeria ‘Rail Mass Transit ’ and Ghana which use rail-based systems. It is a breakthrough to urban road congestion in the growing cities. For that matter, BRT in this context would mean any large-scale, cost effective urban transport system that guarantee a comfortable and systematic flow of traffic from residential areas to the central business district in the mornings and vice versa.

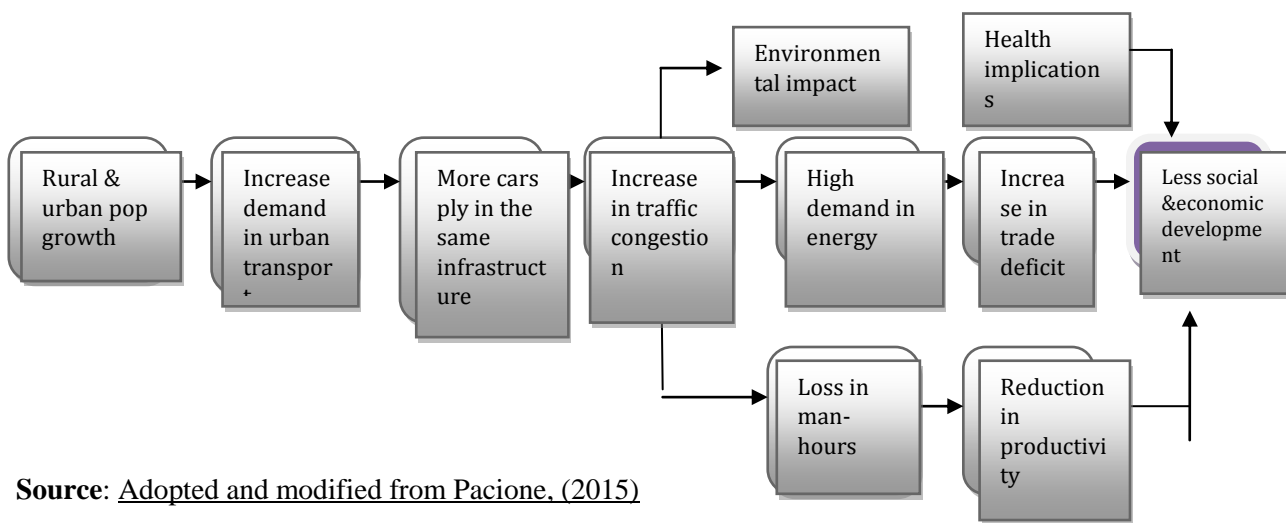
### Problem Context

Traffic congestion continues to remain a major problem in most cities around the world. In Africa, particularly Sub Saharan Africa, traffic congestion has exacerbated the level and intensity of economic deprivation of many nations, thus denying the significant contribution of transport sector is expected to offer directly or indirectly in accelerating socio-economic development. There have been several attempts, however; no long-lasting solutions how Tanzania and other African governments especially those yet to acknowledge the necessity to modernize public transport systems can curb the problem to a desirable level. Indeed, some studies report that traffic congestion in urban areas cannot be completely eliminated, but can only be minimized to an acceptable level (OECD, 2007).

In assessing the impact of traffic congestion in the country, numerous previous studies in Tanzania have focused on socio-economic effects; like those which have impacted on national economic development resulting in excessive delays, increased fuel wastage and monetary losses (Katala and Elinazza, 2010) and on the environment (Msafiri, 2005); (Othman, 2010) and (Lupala, 2010). Currently the implementation of the Second Five Years Development Plan (IIFYDP) of The Tanzania long term perspective plan (LTPP), 2011/12 - 2025/26, the roadmap to a middle income country 2025 is underway the economic growth in Tanzania and other Sub Saharan Africa countries remain constrained by ineffective public transportation systems which excessively incapacitate workers’ performance and unnecessarily add cost to production despite of several initiatives that were taken; there is a great need therefore for an alternative economically viable transport solution.

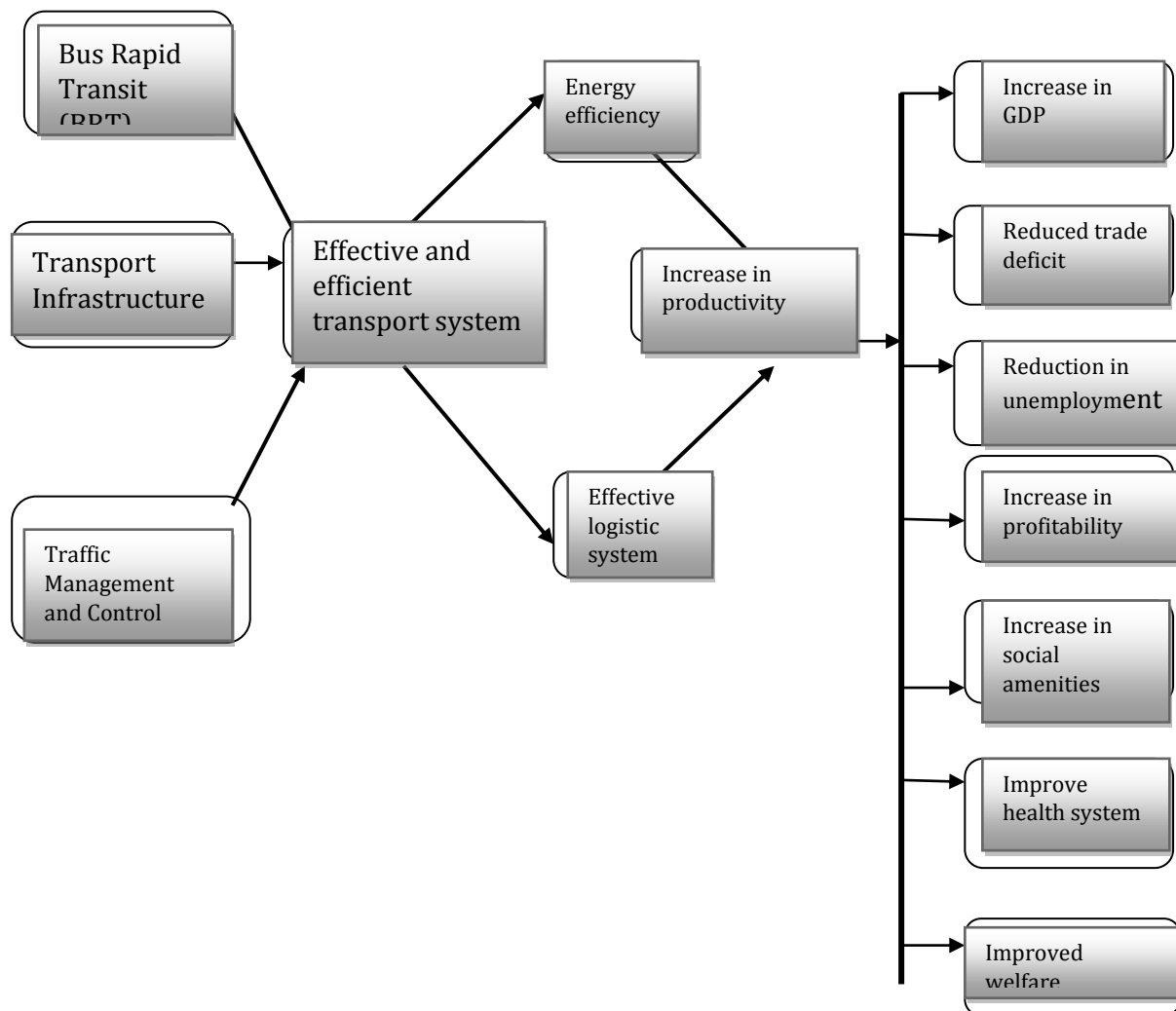
### The Conceptual Frameworks

**Figure 1. The Conceptual Framework for Analyzing the Impact of Traffic Congestion on Economic Development**



Source: Adopted and modified from Pacione, (2015)

**Figure 2 – The Conceptual Framework for Analyzing the Effects of Bus Rapid Transit (BRT) on Social Economic Development**



**Source:** Adopted and modified from Karsson et al., (2007)

The conceptual frameworks in figures (1 and 2) give a graphical display of transportation situation in Dar es Salaam and its possible end result. It explains that the growing demand for social services in urban cities, transport in particular resulted from population surge as there were no other developed forms of transport infrastructure in the urban area; traffic congestion thus became evident as more vehicles plied on the same mode of transport. The consequences of this situation is high energy demand, environmental implication and reduction in productivity, a state that lead to affect the nation socio-economic development.

However, adoption of Bus Rapid Transport system (BRT) that utilizes its own infrastructure will provide effective and efficient transport system, remove commuter buses, encourage motorists to switch to public transport and give more space to other vehicles on the road. This situation will improve energy use, increase workforce productivity which is an important economic factor in the gross domestic product growth.

### **Aim of the Study**

From an urban mobility perspective, good public transport systems are an essential part of safe, clean and affordable transport for development, therefore this study aims at persuading governments in Sub Saharan

Africa especially those yet to adopt it, to undertake BRT system as an alternative solution to the traffic congestion, also to emphasize a more reframing of the urban transport debate by showing accessibility and transport in cities is increasingly linked not only to economic development but also for improving sustainable mobility and encourage low-carbon growth in cities.

## METHODOLOGY

This study principally used meta-analysis approach in which various previous quantitative research and literatures on traffic congestion were reviewed. Therefore, the statistics used were obtained largely from secondary sources, such as the internet, papers, books, newspapers and reports focusing on traffic congestion in Dar es Salaam and other major cities. The method is preferred because it is helping to learn from other researchers' experiences and to guarantee that in choosing and implementing specific responses, the researcher becomes aware of both the advantages and disadvantages attached to, or similar responses when implemented elsewhere.

## FINDINGS AND DISCUSSION

Dar es Salaam is the commercial hub and centre of government business in Tanzania, accounting for more than 60% of national revenue of the country as a whole (DIDP, 2010). According to (UNIDO, 2012) about 76% of industrial and manufacturing industries in Tanzania are found in Dar es Salaam. Though the Tanzanian industrial and manufacturing sector accounts for less than 10% of the Tanzania GDP, the sector continues to be of a considerable importance to the Tanzania economy (*Ibid.*)

Industrialization attracts growth of transport and communication in a particular region and opens up opportunities to access essential services as well as social activities like schools, colleges, technical institutions, banking and health services (Rodrigue *et al.*, 2009). Importance of industrialization for economic development can also be clearly seen in the promotion of international trade. Less developed nations experience trade deficit due to export of primary products, unless they undertake on export promotion through industrial development it will be difficult to graduate into globally competitive economies. Therefore cities and growing urban centres which are predominantly industrial towns need effective urban transport that fulfills the demand for accessibility within cities (*ibid.*).

Urban transport system in most Sub Saharan countries is shared by public transport, private and central government that end such service into ruin. Consortium (2008) delineates how the government also take part in the public transport in urban cities in Sub Saharan Africa: In Cameroon, where Société des Transports Urbains du Cameroun (SOTUC) owned both by central govern and the municipalities of Douala and Yaoundé, public transport services has been characterized by the operation of private vehicles namely shared taxis, minibuses and motor-cycle-taxis which, unfortunately, do not effectively meet demand and quantity, especially during peak hours .

In Cental African Republic, the report further explains since the 1970s public transport was dominated by 'Compagnie Nationale des Transports Routiers (CNTR)' Since its collapse in 1979, public transport activity was left to informal sector to take over with its minibus and taxi operations. As a result to-date, Bangui has no public transport by large bus and the sector is largely reduced and essentially based on the low capacity units of the informal sector, a source of much dysfunction (Kumar & Fanny, 2008).

Whereas, in Chad and N'djamena is no exception, public transport is dominated by motorcycle-taxis locally known as "clando". In Congo, particularly in the capital Brazzaville, to-date the public transport is dominated by the informal private sector 95% however, they are considered far from giving expected results (*ibid.*).

In the Democratic Republic of Congo (DRC) especially in Kinshasa, STUC (Société des Transports Urbains du Congo) is owned by Congolese state and other private entities. Transport in Kinshasa is essentially provided by vehicles owned by private operators Consortium (2008).



In Bujumbura the capital, the bulk of public transport is provided by private and informal operators which account for around 90% of the public transport market share, the remaining 10% being covered by the State public company called OTRACO (Office des Transports en Commun) (Kumar & Fanny, 2008) .

Nadir (1996) argues that the input of productivity is a state or national investment in transportation whilst the output is gross domestic product (GDP) growth. In order to maintain economic growth, effective urban transportation is required to connect people to jobs, products to markets. The direct benefit of an efficient and effective urban transportation systems reflects in the reduced travel time, which translates into cost saving, increase in output and ultimately GDP (Kulash 1999, World Bank 2002).

On the other hand a Global Review by (ILO, 2013) acknowledges an increase in labour productivity within economic sectors as the main driver of economic growth, but on the other hand traffic congestion affects workers' well-being in different ways. For example additional vehicle emissions (air quality) on the people, tiredness, stress, delays, wastage of time, early wake up, and lack of enough time to rest affect workers' performance ( productivity) and the economy in general .

Furthermore, (Weisbrod & Reno, 2009) suggest that effective transportation system contributes to productivity by improving business ability to provide goods and services, improving people's ability to access education and health services, create employment and reduce vehicle operation cost as well as emission and safety benefits. Thus effective transportation system improves productivity which is a key determinant of economic growth and living standards.

Despite having only 1,590.5 square kilometer of land, Dar es Salaam is the most densely populated city in the country with a total population of 4,364,541 which is 10% of population (URT, 2014). According to (SUMATRA, 2011) the volume of traffic available in the city based on Tanzania Revenue Authority records between 2003 and 2011 a total of 1,010,732 cars were registered; 7,000 being commuter busses. On this, Elinazza in Kiunsi (2013),pg. 97 comments:

*"It is estimated that about 60 to 70 per cent or between 606 439 to 707 521 cars are plying in Dar es Salaam roads. In addition a total of 245 180 motor-cycles and 7,408 tricycles were registered by the TRA in 2010 and 2011 respectively. Even though there is no definite figure of transportation vehicles, most of the imported motor-cycles and tricycles are plying Dar es Salaam roads."*

On this, JICA had established travel speed the extent of traffic congestion in the city as;

*"The congestion is more serious in the morning and evening traffic peak hours. In the morning peak hours traffic speed reduced to between 20 and 30 km/h at a distance of 25 to 30 km from the city center for most of the main roads. As one approaches the city center traffic speed is reduced between zero and 10 km/h within the city center and the immediate surrounding areas. In the evening peak traffic the reverse happens. Traffic speed within the city center is between 10 and 20 km/h and decreases to between zero and 10 km/h just outside the boundaries of the city, before picking up to speeds of more than 60km/h near the outskirts of the City. Traffic congestion is more critical in all major road intersections of Morogoro Road at Ubungo, Magomeni (Morogoro/Kawawa roads), Bibi Titi Mohamed and Morogoro Road junction. Other roads with crititcal traffic congestion are Nyerere Road at Tazara, Chang'ombe, Msimbazi, UN/ Kinondoni junction, Old Bagamoyo at Mwenge and Nelson Mandela Road at Tabata and Buguruni intersection. At these road intersections it is not uncommon to spend between 10 to 25 minutes before crossing" (JICA in Kiunsi 2013).*

Ng'hily (2013) reinforce this assertion by showing mathematically that increased traffic congestion in the Dar es Salaam's urbanized areas imposes cost upon commuters and affect business operations. It is estimated that

total traffic congestion costs is 411bn/- annually. “Commuter owners lose around 265bn/- in income and 25.5bn/- in fuel costs yearly, while employers lose 120.4bn/- in the same period, being wages paid to workers who are not working because they are trapped in traffic jams.”

With regard to such a loss and the impact of inflation to Tanzanian currency against US dollar, statisticians project that Dar es Salaam economy in the near future will experience a loss of at least 2.06trn/- yearly. In fact 2.06trn/- is more than the budget for the Ministry of Work of the 2012/2013 fiscal year *ibid*.

BRT services are being implemented in some countries across Africa; in Sub Saharan Africa rail-based systems operate in Ethiopia, South Africa, Ghana and Lagos in Nigeria. In East Africa, BRT operate only in capital cities of Uganda and Tanzania. The BRT system in Dar es Salaam runs for 21 km along Morogoro Road Corridor URT. (2017); comparatively the BRT coverage has relieved an insignificant number of population that woe for quality transport in the city, traffic congestion is still a reality particularly on the other routes not reached by BRT system . With about 1,590.5 square kilometer of land and estimated 5-million inhabitants, Dar es Salaam can never be relieved of traffic congestion without a network of BRT systems.

An expansion of the BRT system to cover the large percentage of remaining city’s population will realize an increased economic opportunities for residents and businesses. As it enjoys bus-only lanes, BRT are much quicker compared to the commuter buses, it offers convenience to passengers as they pay at the station. Also, user-friendly infrastructure to individuals with limited mobility hence encourages motorists to switch to large-scale transport system and reduce private car use (Hook, 2007). Costs will greatly be reduced; productivity can be improved; and thus both human and economic development can be realized. In addition, reduced pollution, less required space for transport and improved road safety will lead to improvement of the quality of life (Robin & Wytse, 2011).

## CONCLUSION

Population growth had been and still is a serious growing problem in Tanzania and has led to a number of socio-economic and environmental impacts. In this study, statistics have shown that Tanzania had gone through unprecedented population growth in the early years after independence which led to increased urbanization; growing demand for social services like transport became a pronounced resultant effect in urban cities like Dar es Salaam.

Recognizing transportation as one of the key sectors of the economy, experiences on the ground have indicated that; in most Sub-Saharan urban cities public transport is provided by state, private and informal sectors where the infrastructures are overstretched resulting to traffic congestion. Traffic congestion affects the economy negatively by distressing the workforce performance in businesses and, eventually leading to less socio-economic development. BRT system improves transport system and guarantees ease labour mobility; improves productivity which is a key determinant of economic growth and social welfare.

## RECOMMENDATIONS

Based on the findings and the conclusions obtained from the study, the following recommendations are made by the researcher:

- i. A network of BRT system is needed to cover a large part of the city’s population; this can be done in phases upon the government availability of fund.
- ii. In all major road intersections where congestion is critical especially during peak hours, construct flyover and give queues permanent solution.
- iii. Construct affordable parking facilities near the BRT terminals and stations to allow private car users from the outskirts /interiors to park before embark on BRT vehicles.
- iv. The Government should enforce the use of staff-buses to its ministries and agencies as well as private companies during the working days with the intentions of getting rid of more vehicles on the road.

- v. Rehabilitate and construct the collector roads to bituminous standards which can easily take cars out of city using other routes rather than main roads.
- vi. Improve alternative transport such as waterways or local commuter train so as to avoid reliance over road based transport.
- vii. All transit cargoes should be off loaded from an inland port located in the periphery of the city, the railway transportation should be used to move the cargo to and from the harbor.

## REFERENCES:

- A, K. (2010). *Dar es Salaam Infrastructure Development Programme (DIDP)*. Dar es Salaam.
- Aderamo, A. (2012). Urban transportation problems and challenges in Nigeria: A planner's view. *Prime Research on Education*, 2(3), 198 -203.
- Athuman, R. (2010). *4 satellite town to make Dar es Salaam roomy*. Retrieved March 9, 2016, from DAILY NEWS: <http://dailynews.co.tz/home/?n=12573>
- Barney, G. (2013). *The Global 2000 Report to the President of the US: Entering the 21st Century: The Technical Report (Vol. 2)*. Elsevier. Elsevier.
- Consortium., T.-A. (2008). *"Overview of public transport in Sub-Saharan Africa."*. Brussels: TransAfrica project, UITP.,
- Elinaza, A. (2010). *Dar es Salaam traffic congestion begs solutions*. Retrieved June 20, 2016, from DAILY NEWS: <http://www.dailynews.co.tz/home/?n=13937>
- Elinaza, A. (2012). *Car imports soar by 70 per cent, increase oil bill*. Retrieved June 9, 2016, from DSE: <http://tzexchange.blogspot.com/2012/02/car-imports-soar-by-70-per-cent.html>
- Elisonguo, A. (2013). *The social-economic impact of road traffic congestion in Dar es Salaam region*. Retrieved June 12, 2016, from [http://www.academia.edu/10448800/THE\\_SOCIAL-ECONOMIC\\_IMPACT\\_OF\\_ROAD\\_TRAFFIC\\_CONGESTION\\_IN\\_DAR\\_ES\\_SALAAM\\_REGION](http://www.academia.edu/10448800/THE_SOCIAL-ECONOMIC_IMPACT_OF_ROAD_TRAFFIC_CONGESTION_IN_DAR_ES_SALAAM_REGION)
- Foundation, T. W., gtz, UNEP, & GEF. (2007, June). *Bus Rapid Transit Planning Guide*. New York: Institute for transport & Development Policy.
- Harriet, T., Poku, K., & Emmanuel, A. (2013). An assessment of traffic congestion and its effect on productivity in urban Ghana. *International Journal of Business and Social Science*, 4(3) 2013.
- Hook, W. (2007, June). *Bus Rapid Transit: Planning Guide*. Retrieved 2016, from ITDP: <http://www.nbtri.org/docs/pdf/ITDP%20BRT%20Planning%20Guide.pdf>
- Institute of Transportation Engineers. (1989). *A toolbox for Alleviating Traffic Congestion*. Retrieved 2016, from ITE: <http://www.ite.org/itejournal/>
- JICA. (2007). *Dar es Salaam Transport Policy and System Development Master Plan*. (np). JICA.
- JICA. (2013). *Development Challenges in Africa Towards 2050*.
- Josef International, L. (2016). *VISIT TANZANIA*. Retrieved July 2, 2016, from [visittanzania.co.tz: http://www.visittanzania.co.tz/destinations-maps-2/](http://www.visittanzania.co.tz/destinations-maps-2/)
- Karlsson, C., Anderson, W., Johansson, B., & Kobayashi, K. (2007). *The Management of infrastructure: Performance, Efficiencies and Innovation*. UK: Edward Elgar publishing Ltd.
- Katala. (2016). *The cost of traffic congestion and accidents to the economy in Tanzania*. Retrieved 2016, from The Institution of Engineers of Kenya: [http://www.iekenya.org/download/Jumbe N.Katala](http://www.iekenya.org/download/Jumbe%20N.Katala)
- Kiunsi, R. (2013). A review of traffic congestion in Dar es Salaam city from the physical planning perspective. *Journal of Sustainable Development*, 6(2), 94.
- Kumar, A., & Fanny, B. (2008). *Struck in Traffic: Urban transport in Africa*. AICD.
- Lupala, J. (2010). Sustainable urbanization and spatial growth of the cities in the least industrialized countries; The case of Dar es Salaam City. *Journal of Building and Land Development*. 17.
- M&G. (2015, September 21). *Sub-Saharan Africa's first light rail system starts operations—you guessed it, in Ethiopia*. Retrieved July 12, 2016, from Mail & Guardian Africa: <http://mgafrika.com/article/2015-09-20-sub-saharan-africas-first-light-rail-system-starts-operationsyou-guessed-it-in-ethiopia>



- Mahmud, K., Gope, K., & Chowdhury, M. (2012). Possible causes & solutions of traffic jam and their impact on the economy of Dhaka City. *Journal of Management and Sustainability*, 2 (2),112.
- Mbara, T. (2002). *Transport: how have African cities managed the sector? What are the possible options, urban and city management course for Africa, Uganda*. Kampala.
- Mfinanga, D., & Fungo, E. (2013). Impact of Incidentson Traffic Congestion in Dar es Salaam City. *Intrenational Journal of Transportation Science and Technology*, 2(2),, 95 - 108.
- Munzwa, K., & Wellington, J. (2010). *Urban development in Zimbabwe: a human settlement perspective*. Zimbabwe: Theoretical and Empirical Researches in Urban Management. (14), 120.
- Nadir, M., & Mamuneas, T. (1996). *Contribution of Highway Capital to Industry and National Productivity Growth*. Retrieved January 20, 2017, from [www.ntl.bts.gov/lib/5000/5800/5807/growth.pdf](http://www.ntl.bts.gov/lib/5000/5800/5807/growth.pdf)
- Ng'hily, D. (2013, Dec 31st ). *Dar traffic jams costing 411bn/- yearly: study*. Retrieved June 2016, from TMSA: <http://www.trademarksa.org/news/dar-traffic-jams-costing-411bn-yearly-study>
- OCGS, N. a. (2014). *nbs.go.tz*. Retrieved June 18, 2016, from URT: [http://nbs.go.tz/nbs/takwimu/census2012/Basic\\_Demographic\\_and\\_Socio-Economic\\_Profile\\_PopularVersion-KeyFindings\\_2012\\_PHC\\_EnglishVersion.pdf](http://nbs.go.tz/nbs/takwimu/census2012/Basic_Demographic_and_Socio-Economic_Profile_PopularVersion-KeyFindings_2012_PHC_EnglishVersion.pdf)
- OECD. (2007). *Managing urban traffic congestion*:. Retrieved June 2016, from International Transport Forum: <http://www.internationaltransportforum.org/jtrc/CongestionSummary.pdf>
- Othman, O. (2010). Roadside levels of ambient air pollutants: SO, NO,CO and SPM in Dar es Salaam 22 City. . *Tanzania Journal of Natural and Applied Sciences (TaJONAS)*, 1(2).
- Reporter, M. A. (2015, Sept. 15). *Sub-Saharan Africa's first light rail system starts operations—you guessed it, in Ethiopia*. Retrieved July 12, 2016, from Mail & Guardian Africa: <http://mgafrica.com/article/2015-09-20-sub-saharan-africas-first-light-rail-system-starts-operationsyou-guessed-it-in-ethiopia>
- Ribeiro, K., Kobayashi, S., Beuthe, M., Gasca, J., Greene, D., Lee, D., et al. (2007). *Transport and its infrastructure*. United Kingdom and New York: Cambridge University Press.
- Robin, & Wytse. (2011). *Introducing Sustainable Urban Transport. A Case of Kampala, Uganda*. Kampala.
- Rode, P., Floater, G., Thomopolous, N., Docherty, J., Shwinger, P., Mahendra, A., et al. (2014). *Accessibility in cities: transport and urban form*.
- Rodrigue, J., Comtois, C., & Slack, B. (2013). *Transportation Modes, Modal Competition and Modal Shift*. Retrieved July 2016, from THE GEOGRAPHY OF TRANSPORT SYSTEMS: <https://people.hofstra.edu/geotrans/eng/ch3en/conc3en/ch3c1en.html>
- Rodrigue, J.-P., Slack, B., & Comtois, C. (2013). *The Geography of Transport Systems*. Retrieved July 9, 2016, from Transportation Modes, Modal Competition and Modal Shift: <https://people.hofstra.edu/geotrans/eng/ch3en/conc3en/ch3c1en.html>
- Roux, Y., Del Mistro, R., & Mfinanga, D. (2011). *A methodology for comparative analysis of public transport systems in Africa cities. SATC2011*.
- Setebe, M. (1994). *Analysis of demand for parking facilities in the city of Dar es Salaam*. Dar es Salaam.
- SUMARTA. (2011). *STUDY ON USER NEEDS AND MANAGEMENT OF PUBLIC TRANSPORT SERVICES IN DAR ES SALAAM* . Dar es Salaam.
- UNIDO, & URT. (2012). *Tanzania Industrial Competitiveness Report*. Dar-Es-Salaam: URT.
- URT. (1996). *Sustainable Industrial Development Policy-SIDP (1996 - 2020)*. Dar es Salaam: Minisrty of Industry and Trade.
- URT. (2014). *Basic Demographic and Socio-Economic Profile*. Retrieved June 24, 2016, from [nbs.go.tz](http://nbs.go.tz/nbs/takwimu/census2012/Basic_Demographic_and_Socio-Economic_Profile_PopularVersion-KeyFindings_2012_PHC_EnglishVersion.pdf): [http://nbs.go.tz/nbs/takwimu/census2012/Basic\\_Demographic\\_and\\_Socio-Economic\\_Profile\\_PopularVersion-KeyFindings\\_2012\\_PHC\\_EnglishVersion.pdf](http://nbs.go.tz/nbs/takwimu/census2012/Basic_Demographic_and_Socio-Economic_Profile_PopularVersion-KeyFindings_2012_PHC_EnglishVersion.pdf)
- URT. (2014). *Basic Demographic and Socio-Economic Profile:Key Findings*. Dar es Salaam Tanzania: NBS and OCGS.
- URT, & UNIDO. (2012). *Tanzania Industrial Competitiveness Report*. Dar es Salaam.
- URT. (2017). *DAR RAPID TRANSIT AGENCY*. Retrieved Feb 21, 2017, from DART: <http://dart.go.tz/en/system-map-phase-one/>
- Weisbrod, G., & Reno, A. (2009). *Economic Impact of Public Transportation Investment*. American Public Transportation Association.

- Wenban-Smith, H. (2014). *Rural-Urban Linkages: Tanzania Case Study*. The Ford Foundation.
- WorldBank. (2002). *Cities on the move. A world Bank transport strategy review*. Washington DC: United Front Publishers.
- Yu, H. (2008). In *The Geography of Transport Systems: Jean-Paul Rodrigue; Claude Comtois; Brian Slack*. (p. 284). New York.