

THE IMPLEMENTATION OF BUS RAPID TRANSIT (BRT) IN MAKASSAR BASED ON ECONOMIC PERSPECTIVE

Karina Mayasari¹, Dewanti²

^{1,2}Magister Perencanaan Wilayah dan Kota, Universitas Gaja Mada

¹Email : karinamayasari@outlook.com

Diterima (received): 28 November 2018 Disetujui (accepted): 03 Februari 2019

ABSTRACT

Transport availability and efficiency affects globally and nationally economic development patterns and can be a boost or a barrier to economic growth within individual nations. Urban transportation has an important role in economic growth because transportation has a characteristic as a derived demand in economy. This research's aim to find out the relation between the public transportation to the economy and to find out the reason why the public transportation is needed in a city in Makassar City case. From a theoretical perspective, the possible things that happened in Makassar is there is changes in economic growth cause changes in transport activity, meaning that growth in the demand for travel depends on economic growth. The development of the city has not been integrated with the development of social service and economic services in the area multifunctional and does not follow transit-oriented development, so the volume of movement of the population is very high towards to downtown service centers, whereas housing development should be brought closer to the service centers with mixed function and bus stop for transportation mode transfer. So basically, public transport is a must in Makassar due to its benefits to the economic in Makassar.

Keywords : *brt, bus, economic*

A. INTRODUCTION

Transport availability and efficiency affects globally and nationally economic development patterns and can be a boost or a barrier to economic growth within individual nations¹. Transportation investments link factors of production together in a web of relationships between producers and consumers to create a more efficient division of production, leverage geographical comparative advantage, and provide the means to expand economies of scale and scope. Transport's contribution to economic development includes the following²:

- Network effects—linking more locations exponentially increases the value and effectiveness of transport

¹ Krugman P (2009) The increasing returns revolution in trade and geography. *American Economic Review* 99(3): 561–571.

² The world Bank Report. 2011. *Railway Reform: Toolkit for Improving Rail Sector Performance*. Chapter 1: Introduction, pp 2.

Karina Mayasari and Dewanti, The Implementation of Bus Rapid Transit (BRT) in Makassar Based on Economic Perspective

- Performance improvements—reducing cost and time for existing passenger and freight movements increase transport's contribution to economic growth
- Reliability—improves time performance and reduces loss and damage, thus reducing economic drag
- Market size-access to wider markets adds to economies of scale in production, distribution, and consumption, thereby increasing economic growth
- Productivity—transport increases productivity gained from access to a larger and more diverse base of inputs such as raw materials, parts, energy, and labor, and broader markets for more diverse outputs

Urban transportation has an important role in economic growth because transportation has a characteristic as a derived demand in economy. Derived demand is a term used in economic analysis that describes the demand placed on one good or service as a result of changes in the price for some other related good or service. It is a demand for some physical or intangible thing where a market exists for both related goods and services in question. This demand for transport is largely a 'derived' demand, arising from economic and social activities. For example, the purchase of goods and services by end users requires inputs to be transported to production centres, which creates a demand for freight services. The demand for passenger transport arises from the need for journeys to work, education, consumption centres and social needs³.

Public transport has an important role in the development of the economy. To lead to the sustainability of public transport requires serious handling from many aspects. Transport is an important element in the economy because it deals with the distribution of goods, services, and labor, and is the core of the economic movement in the city. Various forms of public transport mode with the characteristics and level of service provided coloring to the development of city. Public transport system should be oriented to comfort and security so that it can compete with private transportation.

Urban public transport is one of the backbones of urban economy where 'good' and 'healthy' cities can be marked by the condition of their urban public transport system. This is because transportation cannot be separated from human life as long as it is needed in the distribution of materials, the movement of human activities as well as goods as a micro component of an economy. The transport sector should be able to provide convenience for the whole community in all activities in all different locations and dispersed with different physical characteristics. With the safe, fast and cheap public transport, in addition to reflecting the regularity of the city, it also reflects the smoothness of the city's economic activities. The problems that will be discussed further in this paper are:

1. How is the relation between the public transportation to the economy?
2. Why the public transportation is needed in a city?
- 3.

³ Ministry of Transport of New Zealand. 2014. Contribution of Transport to Economic Development: International Literature Review with New Zealand Perspective. New Zealand. Pp16.

B. LITERATURE REVIEW

1. The Definition of Transportation

Transport or transportation is the movement of people, animals and goods from one location to another. Modes of transport include air, rail, road, water, cable, pipeline and space. The field can be divided into infrastructure, vehicles and operations. For more detailed, it can be seen on this graph.

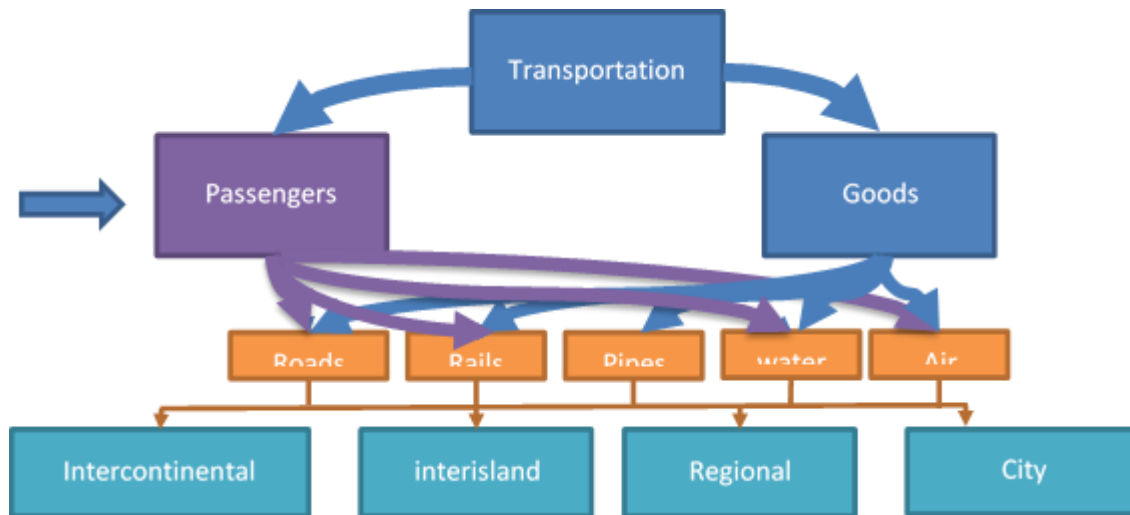


Figure 1. Definition of transportation

2. The Role of Transportation in The Economy

Transportation does affect the economy in a city or regional. In these relationship, there are some relationships which are⁴:

a. Availability of Goods

The real effect from good and cheap transportation are provision or procurement on the community of goods that cannot be generated locally due to climatic factors or limited resources. More over with good transportation, many people can have access to the goods to meet their needs.

b. Stabilization and Equalization Prices

With easy transportation then the movement of goods from one place to another tends to trigger the price stabilization and equalization prices.

c. Price Reduction

Similar with previous point, transportation will reduce price of goods. However, it significantly seen only if transportation cost become one of the factor in determining the price of production.

d. Increase Land Value

Many unprofitable and unfeasible agricultural land for farming because the results cannot be sold to the market due to their remote location and expensive transportation costs. However, by its accessibility to transportation

⁴Kadir, A. 2006. Transportasi: Peran Dan Dampaknya Dalam Pertumbuhan Ekonomi Nasional. 122-131. Jurnal Perencanaan dan Pengembangan Wilayah WAHANA HIJAU. Volume 1. Nomor 3 April 2006.

in a potential region or area, agricultural land can produce profitable agricultural products because of its products can be move to the market with reasonable prices.

e. Territorial Division of Labor

An area will specialize in the production of certain goods because it has certain comparative advantages, such as the availability of abundant and inexpensive raw materials, the availability of adequate capital, the existence of appropriate skilled labor and so on compared with other regions. With the specialization or division of labor between regions will be a surplus of production due to the specialization concerned.

f. Large and Scale Production

Large-scale production activities usually require sources of raw materials originating from other regions. This would be very economical if the industry concerned uses large-scale machines to save the workforce and have a high level of work specialization. But this large-scale production business would not be profitable if there was no market for the product to be sold. With the existence of transportation facilities, it will get the supply of materials and labor at a low cost so that the resulting production will be able to reach a wider market and also increase the concentration of production in relation to its economy of scale.

g. Urbanization and Population Concentration

With easy and cheap transportation, it will encourage the growth and development and concentration of industry and trade in large and medium scale. Activities and economic activities will result in accompanying activities such as storing, processing, packaging, advertising, financing, and others activities supported by transportation. Everything will be done in the city centers that will lead to the growth and development of large cities accompanied by urbanization of the population to the growing urban areas.

3. The Definition of Urban and Rural

The bureau of the census adopted its present definition of urban for the 1950 census. Included as urban are three kinds of places (Heilbrun, 1987:25)⁵:

- All incorporated municipalities having a population of 2,500 or more.
- The densely settled urban fringe, whether or not incorporated as municipalites, around cities of 50,000 or more.
- Unincorporated places of 2,500 or more population outside any urban fringe are.

All places not defined as urban in the census are counted as rural and further subdivide into rural farm and rural non-farm.

4. The definition of Central Business District

Central Business District or commonly abbreviated as CBD, refers to the commercial center of a large city. It is characterized as “an area of very high land

⁵ Heilbrun, James. 1987. *Urban Economics and Public Policy*. New York, NY: St. Martin’s Press. chapter 3: The Growth of Cities and Metropolitan Areas, pp. 25.

valuation; high of concentration of retail business, offices, theatres, hotels, and service business; and high traffic flow⁶.

5. Defintion of Public Transport

Public transport is transport of passengers using public transport, and executed a lease or pay. In terms of mass transit, transportation costs become a burden shared responsibility, so that the public transport system to be more efficient because the cost of transport is becoming increasingly cheaper. The existence of public transport, especially the nature of mass, meaning a reduction in the number of vehicles passing on the road. This is particularly important with regard to traffic control (Warpani, 2002)⁷.

6. Relation Between Public Transportation to Economy

Transport activity and economic growth appear in the aggregate to be correlated, and assertions that improved mobility causes growth in the economy are common. This causality is important but difficult to prove. From a theoretical perspective, four relationships are possible⁸:

- changes in transport activity cause changes in economic growth, meaning that travel is an essential component of and helps produce economic growth (and poor access and travel conditions can constrain potential economic growth);
- changes in economic growth cause changes in transport activity, meaning that growth in the demand for travel depends on economic growth;
- the causality is bi-directional, meaning that each has an effect on the other; or
- there is no relationship, meaning that the fact that they have tended to grow in tandem does not imply that one causes the other (Ecola & Wachs, 2012). The evidence in New Zealand, supported by evidence internationally, tends to indicate that relationship (ii) is perhaps the strongest of the four possibilities.

The benefits of investments in public transportation cited in the report included: increased efficiency, reduced congestion and costs to motorists, reduced deaths and accidents on the Nation's highways, spurring and fostering of development, improved productivity, creation of jobs, and a reduction of welfare roles. The document divides the benefits of public transportation expenditures into four broad categories:

- Mobility benefits which come from enabling people to more effectively participate in society as producers, consumers, citizens, and community members.
- Efficiency benefits which reduce the cost and economic impact of motor vehicle use.
- Economic development benefits which result as transit encourages and facilitates new development.

⁶ Heilbrun, James. 1987. *Urban Economics and Public Policy*. New York, NY: St. Martin's Press. chapter 3: The Growth of Cities and Metropolitan Areas, pp. 26

⁷ Warpani, P. 2002. *Pengelolaan Lalu lintas dan Angkutan Jalan*. Bandung: Penerbit ITB. Pp 38.

⁸ Ministry of Transport of New Zealand. 2014. *Contribution of Transport to Economic Development: International Literature Revie with New Zealand Perspective*. New Zealand. Pp17.

Karina Mayasari and Dewanti, The Implementation of Bus Rapid Transit (BRT) in Makassar Based on Economic Perspective

- Economic productivity benefits which result when investment in transit improves the productivity of the National economy⁹.

The benefits of investments in public transportation cited in the report included:

- increased efficiency,
- reduced congestion and costs to motorists,
- reduced deaths and accidents on the Nation's highways, spurring and fostering of development,
- improved productivity,
- creation of jobs,
- and a reduction of welfare roles¹⁰.

C. PROBLEM CASE IN MAKASSAR

Makassar City has a total population of 1,449,401 inhabitants (Badan Pusat Statistik Kota Makassar, 2016) and there are about 52,66% of the population growing in the suburbs. The area of development to the east (Tamalanrea Sub-District, Biringkanaya Sub-district and Manggala Sub-district) has a population of 442,487 people with an average growth of 3.17%. While the urban development area to the south (District Tamalate, Mamajang, and Mariso) has a population of 310,288 inhabitants with 2.09% growth. Population growth in both suburban areas is greater than population growth in Makassar (1.63%).

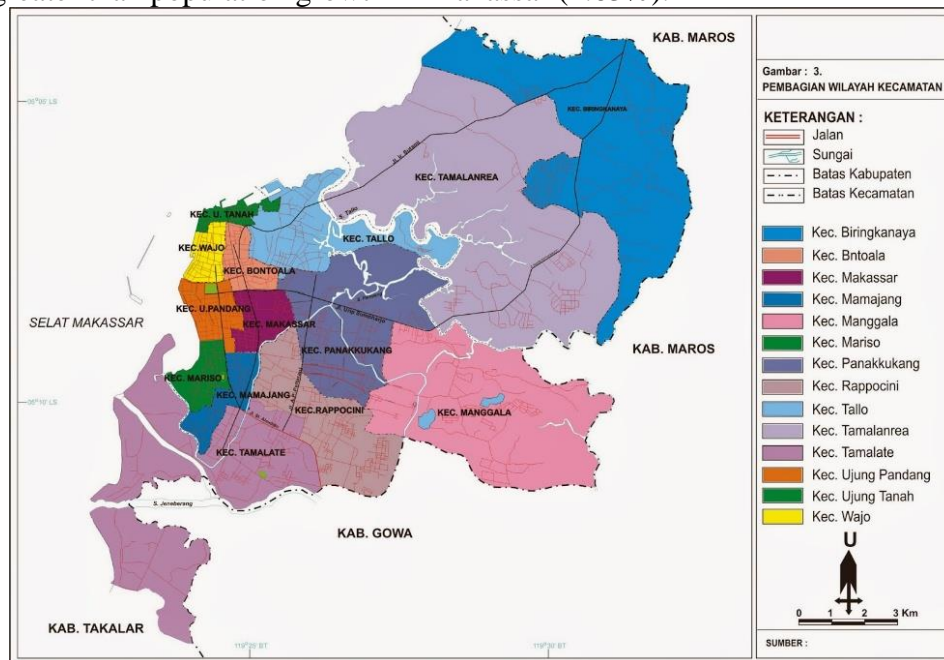


Figure 2. Administration Map of Makassar

From the data above, it can be seen that the growth rate of population in the suburbs increased and on the contrary the rate of growth in the city center is quite

⁹ Jay A Goodwill. 2004. Public Transportation synthesis series III: Relationship between business and public transport. PP 9.

¹⁰ Jay A Goodwill. 2004. Public Transportation synthesis series III: Relationship between business and public transport. PP 10

slow. Five sub-districts on the outskirts of the city experienced an increase in the number of residents, namely Biringkanaya sub-district, Tamalanrea sub-district, Manggala sub-district, Rappocini and Tamalate sub-districts. Population growth can also be seen from the growth of residential areas in the periphery. Below are descriptions of settlement areas in Kecamatan Biringkanayya, Tamalanrea, Manggala and Rappocini:

- a. Kec. Biringkanayya: Permata Sudiang Earth, Sudiang Indah Garden, Gem Sudiang Indah, BTN Pepabri, Housing Kodim, Gelora Pajjaiang Indah, Gems Sudiang Indah, Griya Mulya Asri, Mangga Tiga, Citra Daya Permai,
- b. Kec. Tamalanrea: BTN Antara, BTN Origin, BTN Hamsi, Earth Tamalanrea Permai, Bung, Tamalanrea Lecturer Housing, Hartaco Jaya, Hartaco Permai, Nusa Tamalanrea Indah, Telkomas, Wesabbe, Nusa Harapan Permai, etc.
- c. Kec. Manggala: Perumnas Antang, Bukit Baruga, Housing Lecturer Antang, Grand Aroepala, etc.
- d. Kec. Rappocini: Griya Estate, Delta mas, UNM Housing, Palm Mas, Griya Panakukang Indah, Green Permata Earth, Permata Sari, Minasa Upa Alauddin, Taman Madani Villa, Permata Hijau Earth, New Bougenvil, Tamalate Housing. Toddopuli, etc.

Makassar City has three main access classified as primary road network, namely: (1) Jalan Perintis Kemerdekaan (primary artery), connecting access to East Town / Regency of South Sulawesi region; (2) Jalan Tol Ir. Sutami, which links access to cities / districts in the west (South Sulawesi and West Sulawesi); And (3) Jalan Sultan Alauddin (primary artery), connecting access to the city / district in the South of South Sulawesi region. These two primary arterial road networks should connect between national or national activity centers with a regional activity center. However, these streets now only serve as centers of housing services that are built irregularly, spread, low density, and without good means of service infrastructure. The model of urban development is urban sprawl, which is a process of expansion of urban activities into the suburbs with irregular patterns of development. Nevertheless, the process is positive because it has moved some residents from high density places in urban areas to suburban areas. The pattern of development in this way has a strong effect on the mobility of the population to the city, which is causing an increase in the number of traffic on the primary arterial road axis¹¹.

Currently in the BTP and surrounding areas there are approximately 150,000 people that should be served by the Center for Area Activity (PKW). This area is served by roads with the primary collector road classification (Jalan BTP Raya) and the road is the primary arterial road channel. Road classification and connectivity between road networks are in accordance with SNI, however the function of existing service centers (PKL) should be increased to PKW. The purpose of the plan is to reduce the movement of traffic to the urban area. Another thing that also requires serious consideration is the presence of investors for

¹¹ Wunas, S, Natalia, V. 2015. Pembangunan Infrastruktur Transportasi di Kota Makassar. Jurnal transportasi Volume 15 Nomor 3 Desember 2015.Pp 174.

PKW, the demand must be large, the intensity of the population density must be high, and the distance the buyer must be relatively close or can be reached by foot or non-motorized driving. Currently the peak hour traffic flow on the main road of the eastern suburban (Jalan Perintis Kemerdekaan) is 4,703 smp / hour, the lowest traffic flow is 2,661 smp / hour (ideal traffic flow for Service Level C is 1,400 smp / hour) with average speed 35.37 km / h (ideal speed is 60 km / h). The traffic flow on the main road west of the suburb (Jalan Sultan Alauddin) at peak hour is 4,016 smp / hour, the lowest is 2,468 smp / hour, with an average speed of 30,45 km / hour¹².

Tabel 1. The peak and non peak hour traffice flow in Makassar

Rond	Peak hour	Non – peak hour	Maks speed	Ideal speed
Jalan Perintis	4,703 smp/hour	2,611 smp/hour	35,37 km/hour	60 km/hour
Jalan Alauddin	4,016 smp/hour	2,468 smp/hour	30,45 km/hour	60 km/hour
Jalan Urip Sumiharjo	3,900 smp/hour	2,200 smp/hour	30 km/hour	60 km/hour

Source: Wunas, 2015

With assumption if a civil servant came late to the office, he will get penalty as 5% from its salary (3,000,000) everyday which around 150,000 every time he come late to the office. Just say, there are 1000 people who loses * 150,000 = 150,000,000 (just for one day). Imagine it with happened every day, every month, every year. It will become a great loss just from one aspect because of the congestion.

D. DISCUSSION

1. Implementation of BRT in Makassar

The 2004 Urban Mobility Report concludes that: “The problem can be stated simply – congestion has grown everywhere in areas of all sizes. Congestion occurs during longer portions of the day and delays more travelers and goods than ever before.”

In addressing the solutions to the problem, the report states: “The problem has grown too rapidly and is too complex for only one technology or service to be deployed. A broad range of solutions are recommended to address current problems and meet growing travel demand including: more road and public transportation projects; efficient utilization of current facilities; managing the demand to avoid peak period travel; and, providing land use options that reduce the effect of growth.”¹³

Public transportation can be a solution to reduce the congestion that has grown everywhere but it need effort. People who always travel with convenience by their own car or motorcycle will not move with their own willingness. It will become a big challenge to the government to make people want to use public transport.

¹² Wunas, S, Natalia, V. 2015. Pembangunan Infrastruktur Transportasi di Kota Makassar. Jurnal transportasi Volume 15 Nomor 3 Desember 2015. Pp 175.

¹³ Jay A Goodwill. 2004. Public Transportation synthesis series III: Relationship between business and public transport. PP6.

Karina Mayasari and Dewanti, The Implementation of Bus Rapid Transit (BRT) in Makassar Based on Economic Perspective

Mass transit helps to make cities more livable in a number of ways. For example, as an alternative to automobiles, mass transit limits the adverse effects of urban sprawl, automobile congestion, energy use, and associated environmental emissions and the potential adverse health effects of all of these factors.¹⁴ Because of its affordability and accessibility, mass transit also provides a wide range of other, less obvious, benefits as well. For instance, at the labor level, mass transit provides employees with a means to get to work, at the employer level, it provides for workforce accessibility, and at the state level, it reduces the reliance on unemployment assistance, as workers are more likely to stay employed if they have easy and affordable means of getting to work.¹⁵ There is spillover directly to the community itself as well, because mass transit results in the need for fewer cars for transport, which results in less property earmarked for parking. This in turn provides for higher economic returns per square mile, higher property values, and more taxes paid.¹⁶

Government try to reduce it by provide mass public transportation such as Bus Rapid Transit (BRT) that has been running since 2014. BRT in Makassar was first operated in March 2014 with only one corridor serving the route from mall to mall in Makassar City under the name BRT Maminasata which next known as corridor route 2. BRT Maminasata is managed and operated by Perum Damri Makassar branch with its aim not only to reduce the use of private vehicles residents, but also also to facilitate the citizens of Makassar or any tourist around the city of Makassar. Until 2016, there have been 63 permanent bus stops and 30 buses already operating serving 3 corridors in Makassar City. The corridor served until 2016 has 3 corridors, namely corridor 1 which serves the airport - mall GTC, Corridor 2 which serves transportation from mall to mall, corridor 3 serving from Palangga Gowa terminal to Power Terminal, and corridor 4 serving from Daya terminal to the Maros terminal.



Figure 1. The BRT in Ahmad Yani Street

¹⁴ Kenworthy JR, Laube FB. Automobile dependence in cities: an international comparison of urban transit and land use patters with implications for sustainability. *Environ Impact Assess Rev.* 1996;16:279–308..

¹⁵ U.S. Department of Transportation Federal Transit Administration. Public transit pays large dividends.

¹⁶ Lewis D, Williams FL. *Policy and Planning as Public Choice: Mass Transit in the United States.* Aldershot: Ashgate; 1999

There are some problems than occurred after the implementation of BRT in Makassar. One of the problems is the BRT use the same road with the public road without divider so at the peak hour it will join other motorized vehicles in road. Another problem is the bus stops are still not comfortable for the passengers. Moreover there is no integration between BRT and other public transportation such as *pete-pete*. Also the location of BRT Stations placement was not optimal and the distance between stations are away. All of those things make the public interest to use the BRT in Makassar is still low.

2. The Relation Between The Public Transportation To The Economy

Transport activity and economic growth appear in the aggregate to be correlated, and assertions that improved mobility causes growth in the economy are common. This causality is important but difficult to prove. From a theoretical perspective, the possible things that happened in Makassar is there is changes in economic growth cause changes in transport activity, meaning that growth in the demand for travel depends on economic growth. However still there is some problem in load factor, which is might cause by another factor that should be investigated more on deeper research.

The benefits of investments in public transportation in Makassar are divided into four broad categories, from mobility benefit, efficiency benefit, economic development benefits, and economic productivity benefits that can be seen in figure 2 below.

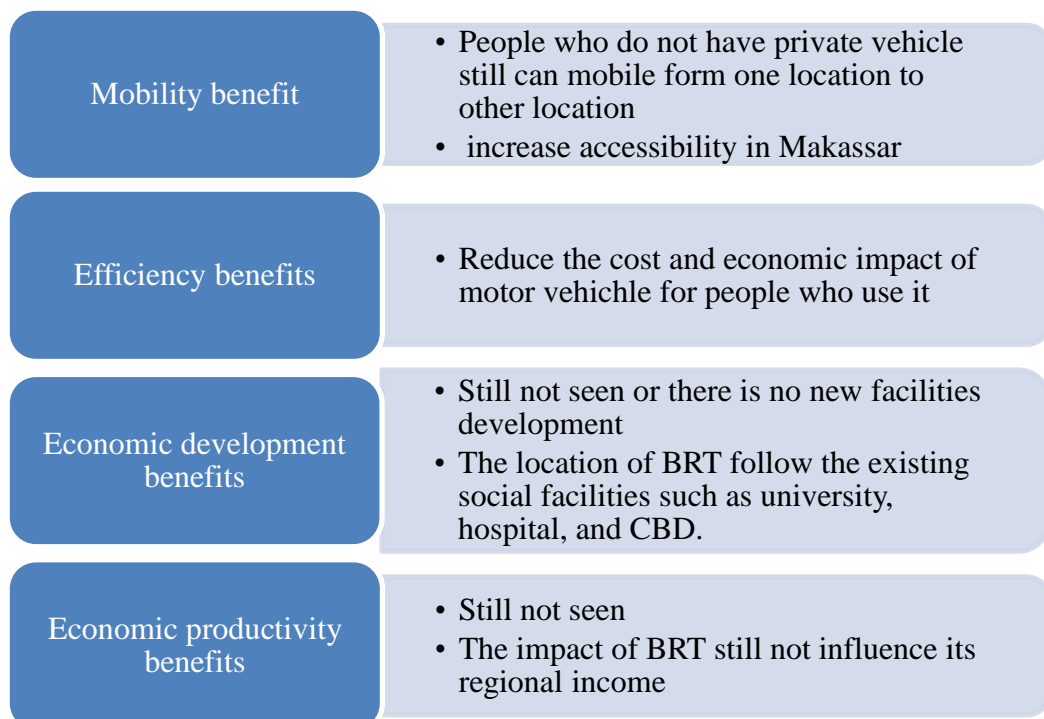


Figure 2. The benefits of Public Transportation Investment in Makassar
Source: Analysis, 2017

3. The Reason Why The Public Transportation Is Needed In A City

First, with BRT's capacity up to 83 people/ trip /bus with 6 trips per day and there are 10 buses then maximum capacity will be : $83*6*10= 4980$ people, so yes it will increase efficiency. The BRT capacity itself will help to reduce the congestion. However it still cannot reduce congestion significantly because the people's interest to use BRT are still low which is seen from its load factor data. Second, the BRT can improved productivity, creation of jobs, and a reduction of welfare roles. Its indeed create jobs for the driver and the ticket seller, and also have forward linkage to bus machine shop, bus workshop, and other jobs in Makassar.

4. Analysis of BRT Based On Its Efficiency

The city of Makassar extends horizontally to the south and east, with a number of low-intensity buildings sporadically spreading and forming a mega urban but without following the hierarchy of road networks and without public transport services.

The development of the city has not been integrated with the development of social service and economic services in the area multifunctional and does not follow transit-oriented development, so the volume of movement of the population is very high towards to downtown service centers, whereas housing development should be brought closer to the service centers with mixed function and bus stop for transportation mode transfer. So basically public transport is a must in Makassar due to its benefits to the economic in Makassar. However, for the government, its still not reach BEP because there is Rp 5 million losses for every bus operational cost in everyday (result interview in 2016).

E. CONCLUSION

Infrastructure and transportation facilities play an important role in the developmental system of the suburban areas, especially to achieve the growth of smart, transport-friendly, and healthy-quality cities. The function of the transport network is closely related to the function of the land and the function of the space that influences it. The interaction of destination and origin of movement is influenced by spatial function, distance reach, and transportation cost. Therefore, Makassar has to start rearranging the suburban space with the concept of smart growth, which is a residential dwelling equipped with social and economic infrastructure (mixed land use) as well as smart transportation with transit and parking access and can be a friendly area for pedestrians. With those positive and negative impact on implementation of BRT in Makassar, should BRT be maintained in Makassar? Yes, Although the daily operational costs are a major loss but still its still lower than losses money due to congestion etc. Moreover, in the future, there is hope that public transportation will replace the use of private vehicle in Makassar.

REFERENCES

Heilbrun, James. 1987. *Urban Economics and Public Policy*. New York, NY: St. Martin's Press. chapter 3: The Growth of Cities and Metropolitan Areas, pp. 25-26.

Karina Mayasari and Dewanti, The Implementation of Bus Rapid Transit (BRT) in Makassar Based on Economic Perspective

- Jay A Goodwill. 2004. Public Transportation synthesis series III: Relationship between business and public transport. Pp 6 – 10.
- Lewis D, Williams FL. 1999. Policy and Planning as Public Choice: Mass Transit in the United States. Aldershot: Ashgate.
- Kadir, A. 2006. Transportasi: Peran Dan Dampaknya Dalam Pertumbuhan Ekonomi Nasional. 122-131. Jurnal Perencanaan dan Pengembangan Wilayah WAHANA HIJAU. Volume 1. Nomor 3 April 2006.
- Kenworthy JR, Laube FB. 1996. Automobile dependence in cities: an international comparison of urban transit and land use patters with implications for sustainability. Environ Impact Assess Rev. 16:279–308..
- Krugman P (2009) The increasing returns revolution in trade and geography. American Economic Review 99(3): 561–571.
- Ministry of Transport of New Zealand. 2014. Contribution of Transport to Economic Development: International Literature Review with New Zealand Perspective. New Zealand. Pp16-17.
- The world Bank Report. 2011. Railway Reform: Toolkit for Improving Rail Sector Performance. Chapter 1: Introduction, pp 2.
- U.S. Department of Transportation Federal Transit Administration. Public transit pays large dividends.
- Warpani, P. 2002. Pengelolaan Lalu lintas dan Angkutan Jalan. Bandung: Penerbit ITB. Pp 38.
- Wunas, S, Natalia, V. 2015. Pembangunan Infrastruktur Transportasi di Kota Makassar. Jurnal transportasi Volume 15 Nomor 3 Desember 2015.Pp 174-175.