

# Palnning for Bus

*by* Pak Bambang 2

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## Planning for Bus Rapid Transit (BRT) in the Perspective of Increasing the Capacity of Public Transportation Services in Purworejo Regency

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**Abstract:** Transport has a vital role in supporting the movement and movement of people. An integrated transportation system is needed as a strategic step to adapt to human needs whose mobility is getting higher due to the modernization culture. To support the capacity building of better public services, the Purworejo Regency government plans to develop a bus-based integrated public transport operation plan known as Bus Rapid Transit (BRT). The BRT operation development plan was reviewed to identify problems in the field to obtain appropriate considerations to manage and develop BRT in Purworejo Regency. Qualitative methods with descriptive analysis were used in this study. The results of this study indicate that the public interest in Purworejo Regency to switch to using public transportation (Bus Rapid Transit) is relatively high; this is evidenced by the calculation of the actual demand for BRT users estimated at 4,382 person trips/day.

**Keywords:** Public Transport Development, Bus Rapid Transit, Public Transportation Performance.

### INTRODUCTION

Modernization has provided many changes in society's socio-cultural life, including changing people's lifestyles to be more dynamic (Miles, 2000; Læssøe, 2010). Therefore, people need public transportation facilities that can facilitate movement and movement with high mobility, especially for those who live in urban areas (Rahmat & Mizokami, 2020; Paulley et al., 2006). Transportation is a significant component in life and living systems, government systems, and social systems. The region's socio-demographic conditions influence transportation performance in the region (Holden & Norland, 2005). The level of population density will have a significant effect on transportation ability to serve community needs. In urban areas, the trend is a high population increase due to both the birth rate and urbanization. The level of urbanization has implications for increasing population density, which directly or indirectly reduces regional transportation competitiveness (Vuchic, 2002; Geng et al., 2013).

Currently, much public transportation or public transportation is operating in Indonesia. Its presence is expected to break down congestion and gradually (shifting) change people's behavior to switch from private vehicles to public transit (Beirão & Cabral, 2007; Glaeser et al., 2008). However, the culture of popularity and existing infrastructure does not make people switch to using public transportation and even further encourages people to depend on private transportation so that congestion and air pollution are still unavoidable (Saliara, 2014; Yakimov & Trofimenko, 2018).

Public transportation or public transportation is all means of transportation when passengers are not traveling using their vehicle. Public transport generally includes trains and buses and includes services for airlines, ferries, taxis, and others (Hensher, 2017). Public transportation is a means of moving people and goods from one place to another. The goal is to help people or groups reach the desired location or send goods from their place of origin to their destination (Cascetta & Carteni, 2014). The benefits of transportation can be seen from various people's lives, which can be grouped into three parts: economic, social, and political.

Transportation is one of the most critical infrastructure<sup>1</sup> that can influence urban development and urban expansion (Nadriana et al., 2019). The level of community demand for public transportation is significant from year to year. Transportation has become a necessity that is as important as primary needs. In its development, the Indonesian government has also made several breakthroughs to accommodate the public's interest to switch to using public transportation through the operation of an integrated transportation system (Rahma et al., 2014), as currently operating in Greater Jakarta.

Integrated public transportation is intended to create a balance and optimization of performance that is complementary between public and private transportation (Saliara, 2014). The presence of integrated public transport is also expected to be a means to reduce congestion and increase travel standards in cities so that they can compete with private transportation (Solecka & Žak, 2014). However, the concept of smart city and smart mobility in Indonesia in practice still focuses on centralized urban / agglomeration areas. It is time for integrated transportation to be developed and connected to the regions (Pratiwi et al., 2015).

According to Govinder (2014), public transportation provides welfare for the community and plays a role in helping industry and the spread of good communication for an area. Where transportation that is connected or connected to various regions is claimed to have a significant effect on the city's development itself (Ionescu, 2012). Public services' availability is a responsibility that requires commitment and synergy from the central and local governments (Rahmadana et al., 2020). To create a better capacity building for public services, the Purworejo Regency Government plans to develop bus-based public transportation known as Bus Rapid Transit (BRT) in its area.

The plan to operate the Bus Rapid Transit (BRT) in Purworejo Regency will later utilize feeder transportation which can be played by existing public transportation to connect passengers to the main BRT corridor (trunk). This service is expected to accommodate public transport users or commuters to access various places, from the city center to the trade center and the public transportation node in Purworejo. Not only that, but this idea is also intended to support the Borobudur National Tourism Strategic Area (KSPN) program so that the existence of this BRT can also facilitate tourist access as well as promote Purworejo, as an area that is not a big city but can provide adequate public transportation services for its people. . And it is not impossible that in the future this area will become a pilot area for other regions or districts in Indonesia.

In practice, the application of Bus Rapid Transit requires a proper development study to optimize its operation, so it is necessary to survey the development of the Bus Rapid Transit Service Corridor in Purworejo Regency, which includes the development of the main corridor (trunk), feeder for public transport services and the operational transport system. Therefore, four problem formulations were developed in this study to determine, (1) How much is the demand for public transportation in Purworejo Regency; (2) What is the potential market for Bus Rapid Transit in Purworejo Regency; (3) What is the amount of Vehicle Operational Costs and the appropriate tariff that must be charged to users of the Purworejo Regency Bus Rapid Transit Transportation services and (4) What is the operation pattern (scheduling, routes, and stop points) of Bus Rapid Transit transportation in Purworejo Regency.

The purpose of this study is to examine the plan for developing BRT operations, where the results of this study can be considered in efforts to manage and develop BRT in Purworejo Regency.

## LITERATURE REVIEW

### The perspective of Capacity Building for Public Transport Services

Almost all countries in the world, both developed and developing countries, are now focused on increasing public transportation capacity, as the operation of public transportation has been implemented in China by utilizing renewable technology (Peng et al., 2012). Public transport has become an essential infrastructure in the economy. Therefore matters concerning the improvement and development of transportation become something that needs to be done sustainably (Ionescu, 2012; Steg & Gifford, 2005).

The pros and cons of improving public transport services can be seen from how people trust and use public transport modes rather than private vehicles. It's just me in practice; there are still many people who have not maximally utilized this facility (Nursyamsu, 2019). To improve public transportation to reach the target, a commitment between the central and local governments is needed (detik.com, 2020).

## Public Transportation

Transportation is considered the "artery of the city" because it has a long-term role in shaping it (Saliara, 2014). Providing safe and comfortable public transportation is an essential agenda for a nation anywhere because it is related to the community's welfare (Govinder, 2014). On the other hand, for the general public, public transportation has become the leading choice for travel; therefore, public transport is an essential means of realizing justice and social equality (Lei et al., 2017).

In its development, public transportation includes various services that provide mobility to the general public, including buses, trains, ferries, taxis, and others (Litman, 2020). Public transportation or public transportation is one of the most efficient modes of transportation in providing the community's mobility (Polat, 2012), and this service is usually provided by the government or private organizations (Rahmat & Mizokami, 2020).

Lei et al. (2017) explain that the urban public traffic system can be divided into three categories: (1) Bus (or trolleybus): regular buses and Bus Rapid Transit; (2) Rail transit, such as light rail on the ground, subway (line transformation, memorable lines, driverless automatic transport); (3) Supporting public transportation, such as taxis, bicycles, ferries, taxis, urban public bicycles.

## Transportation Request

As the population increases, transportation demand will also increase (Elmansouri et al., 2020). Especially in urban areas, public transportation has become a lifestyle necessity due to traffic congestion problems (Ambak et al., 2016). Public transportation is an essential element of the urban system, which creates a significant demand for travel. Therefore, a mass transit system is needed as an effective way to provide better, advanced, efficient, and effective mass transit services (Khumar et al., 2013).

In terms of mode selection, transportation providers are faced with two groups of users who influence transportation demand, namely captive user and choice user. According to Marquez and Pico (2018), captive users are a group of people who do not have the option of using private vehicles because it is possible for low income to depend on public transportation/transit, while the choice of users is a group of people who can choose between private vehicles or choose to use public transportation.

In some cases, especially in developing countries, the demand for transportation seems to have increased, as in India, bus-based public transport is optimally capable of a maximum per unit once operated, even at least buses can carry 90% of passengers and 65% of goods (Singh, 2005).

## 9 The Study on Bus Rapid Transit (BRT)

BRT is a bus-based integrated mode of transportation currently being used more and more around the world. This concept was first applied in Curitiba, Brazil, in 1974 as an integrated transport network and has become a global phenomenon in the 21st century (Weinstock et al., 2011). In Indonesia itself, the term BRT is more popularly known as a busway. Bus services are operated as transportation in urban areas with a transit system and provide fast, comfortable and low-cost mobility.

According to Wirasinghe et al. (2013), the BRT system's main reasons are the speed, capacity, and reliability it offers because this system uses a special high-capacity (right-of-way) route where the line is free from the reach of cars/motorbikes. This service certainly makes time more efficient and faster than the regular bus system. The BRT system has been claimed to produce several positive results, both in terms of reducing operational costs, travel time, and traffic, and reducing emissions of air pollutants, especially for the introduction of cleaner technology (Marquez & Pico, 2018).

## Public Transport Performance

It is recognized that the quality of transportation consists of two aspects, namely performance measures and service measures (Ambak et al., 2016). Meanwhile, in the public transport literature, public transport performance can be divided into two, namely efficiency and effectiveness (Karim & Fouad, 2018). According to Isorait (2004), transportation performance measurement must be dynamic to provide comprehensive information; performance measurement must be appropriately identified and reviewed to meet community needs. At a minimum, the transport

performance measurement should have: (1) an external monitoring system; (2) an internal monitoring system; (3) a review system; and (4) a development system. Meanwhile, it explained that the performance of public transport.

According to Boyne et al. (2010), the performance of public services needs to be assessed in terms of the realization of the results packaged in a specific policy so that it is easier to achieve the "mission" like an organization and can explain shifts from time to time whether it is getting better or worse. In short, to measure the performance of a service, providers need to focus on the process components and practices used to provide the service. On the other hand, service performance measurement is also influenced by several factors, for examples (1) external environment such as regulations, complexity, dynamism, (2) characteristics of service provider organizations such as planning, culture, leadership, characteristics of human resources, and (3) organizational strategy, such as innovation, knowledge, partnership (Boyne et al., 2010)

### Public Transport Performance Indicators

Transportation performance measurement is carried out primarily to predict, evaluate and monitor the extent to which the transportation system can achieve public objectives. According to Hendarto (2001), the measurement of the level of success or performance of the public transportation system can be reviewed based on two indicators, (1) concerning a quantitative assessment measure which is expressed by a level of service owned and (2) a qualitative assessment and expressed by the quality of service.

The measurement of public transport performance can be classified into four different perspectives, (1) passenger perceptions, related to service aspects/reliability satisfaction, fare, frequency, comfort, cleanliness; (2) general public perception, regarding social elements such as the extent to which public transport meets the needs of seniors and persons with disabilities or environmental issues (congestion, pollution); (3) evaluate and compare the performance of public transport with service providers (system level, route level, operator level); (4) overall performance (Karim & Fouad, 2018).

On the other hand, the measure of transportation performance can also be reviewed through several factors, namely safety, security, environmental pollution, financial perspective, traffic management, and customer satisfaction (Onatere et al., 2014). Meanwhile, according to Nasution (2004), the performance of public transport can also be determined based on service quality, concerning the following aspects: (a) safety, (b) reliability, (c) flexibility, (d) comfort, (e) speed, (f) environmental impact. / social caused by the existence of a traffic operation. The effectiveness of public transport operational performance can also be measured using operational cost parameters; (a) Frequency, (b) Waiting time (headway), (c) Calculation of Vehicle Operating Costs (BOK), (d) Income, (e) Calculation of standard load factors (load factor), (f) Advantages and disadvantages, (g) Fleet Needs Evaluation.

### Quality of Public Transport Services

The quality aspect in service is an abstract and complex construct because it has three unique components: intangibility, heterogeneity, and inseparable from the production and consumption process (Karim & Fouad, 2018). The same thing is also expressed by (Govinder, 2014) where service quality has many attributes, including the tariff, convenience, schedule, reliability, service level, and service security so that it is difficult to identify.

The quality of service provided by the public in the business sector/organization has been identified as a critical strategic factor that results in customer satisfaction, affects loyalty and business success in a long-term, sustainable manner (Sudaryanto & Kartikasari, 2007). Service quality is known as the result of a comparison between the effects of consumer expectations and the perceptions of actual service performance (Dña & Dña, 2014). Customer dissatisfaction occurs when customer expectations regarding service quality are more significant than perceived performance. Karim and Fouad (2018) then define quality in the context of public transport services, explicitly referring to the way transportation organizations keep passengers during their trips.

The quality of service for the implementation of transportation of people using public motorized vehicles on routes is a right that must be obtained by every user of transportation services so that aspects such as security, safety, comfort, equality, and order need to be considered (Said, 2014) Eboli and Mazzulla (2008); (in Dña and Dña, 2014) empirically shows that there are two categories of public transportation services, namely primary and non-

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 basic attributes. Essential attributes such as timeliness, frequency, service coverage, and non-basic attributes, such as cleanliness, courtesy of drivers, are considered secondary service characteristics that affect service quality.

## METHOD

1  
 This research is a descriptive study with a qualitative approach. Descriptive analysis aims to describe something that was taking place at the time the research was carried out and examine the causes of a particular symptom. In this study, data sources in the form of primary data and secondary data were used to produce credibility of research results rich in relevant information (Gunawan, 2013).

6  
 Observations were made to identify problems in the field related to planning for BRT operations in Purworejo District. Observation activities are divided into Home Interview Survey (conducting open interviews with residents) and State Preference Survey (interviewing users of private vehicles, public transportation, and the community to determine the demand for the level of willingness to move if Bus Rapid Transit has been operated). Not only that, but this research also utilizes related literature sources to support the research results, namely by using report data from the Purworejo Regency Government and analysis of the general pattern reports of the Purworejo Regency PKL Team in 2017. Relevant agencies or institutions include Bappeda, the Department of Transportation, and the Office of Work General (PU) Purworejo Regency.

## RESULT AND DISCUSSION

Based on previous field observations, the researcher obtained several relevant data that could be used to study BRT planning in Purworejo Regency comprehensively. From the results of the Home Interview Survey and the State Preference Survey, the following analysis was obtained:

1. From the assessment of the existing road network and public transportation in Purworejo Regency, it is found that the route that will be used in the planning of the Bus Rapid Transit in Purworejo Regency will be pointed to arterial roads and collector roads that pass through potential areas. The ends of the route (beginning and ending) are planned to be at Kutoarjo Terminal (terminal type C), considering easy access and high passenger demand.
2. From the results of the analysis, it is known that the public's interest in switching from private vehicles to public transportation is 18%.
3. From the Forecasting technique or forecasting carried out by taking 5 years of population data multiplied by the estimated total trips (zone I to zone 6), it is estimated that in the next 5 years, there will be 1603 trips/day and in the next 10 years 1665 trips/day.
4. The type of fleet used in the analysis of Bus Rapid Transit transportation planning in Purworejo Regency uses Medium Buses with 500-600 passenger requests per day.

From the results of the analysis that has been carried out, the planning for Bus Rapid Transit (BRT) in Purworejo Regency is summarized in the problem solving below:

1. From the above calculations, the type of bus used in the planning of Bus Rapid Transit transportation from Purworejo Regency is Medium Bus with 30 passengers consisting of 20 passengers sitting opposite each other and 10 standing passengers equipped with a particular additional area for passengers with disabilities.
2. Fleet Needs Actual Demand and Potential Demand can be seen in Table 1 below this :

**Table 1 Results of Fleet Demand Recapitulation Based on Actual and Potential Demand**

| Bus Rapid Transit Routes                                  | Services               |              | Number of Fleet Requirements | Number of Passenger Requests |
|-----------------------------------------------------------|------------------------|--------------|------------------------------|------------------------------|
| Krendetan Market -Non Bus Terminal Kutoarjo Actual Demand | Capacity               | 30 people    | 6 Fleets                     | 4,382 People / Day           |
|                                                           | Operation Time         | 15 hours     |                              |                              |
|                                                           | Route Length           | 24.5 Km      |                              |                              |
|                                                           | Plan Operational Speed | 40 Km / Hour |                              |                              |
|                                                           | Travel Time            | 37 Minutes   |                              |                              |
|                                                           | Headway                | 15 minutes   |                              |                              |

|                                                              |                        |              |           |                     |
|--------------------------------------------------------------|------------------------|--------------|-----------|---------------------|
| Krendetan Market -Kutoarjo Non-Bus Terminal Potential Demand | Capacity               | 30 people    | 15 Fleets | 11,126 people / day |
|                                                              | Operation Time         | 15 hours     |           |                     |
|                                                              | Route Length           | 24.5 Km      |           |                     |
|                                                              | Plan Operational Speed | 40 Km / Hour |           |                     |
|                                                              | Travel Time            | 37 Minutes   |           |                     |
|                                                              | Headway                | 6 minutes    |           |                     |

Source: Primary data processed

3. Because public transportation has interventions from many interests, many cost components must be calculated accurately so that no party is disadvantaged in this planning in the calculation of vehicle operating costs. From the results of the car operational analysis, it can be seen that the Bus Rapid Transit (BRT) rates are:

Table 2 Vehicle Operating Costs (VOC)

| Route | VOC/Bus-Km  | VOC/Psg/Km | Base Fare (Rupiah psg/Km) | Distance (Km) | BEP Fare (Rupiah) | Fare (Rupiah) |
|-------|-------------|------------|---------------------------|---------------|-------------------|---------------|
| BRT   | Rp 6,234.99 | Rp 207.83  | Rp 296.90                 | 12.25         | Rp 3,637.08       | Rp 4,000.78   |

Source: Primary data processed

Based on the calculation results, the costs incurred by the operator, the operator will experience BEP if the passenger reaches 85%. From the price calculation, it is also known that the tariff issued by service users is Rp. 4,000.78 (rupiah).

4. Based on the demand generated from the dynamic survey results and the likely demand analysis results, it is found that the route has the potential to have the most need in the planning of the Bus Rapid Transit route in the Purworejo district. The BRT route can be seen in Figure 1 below:

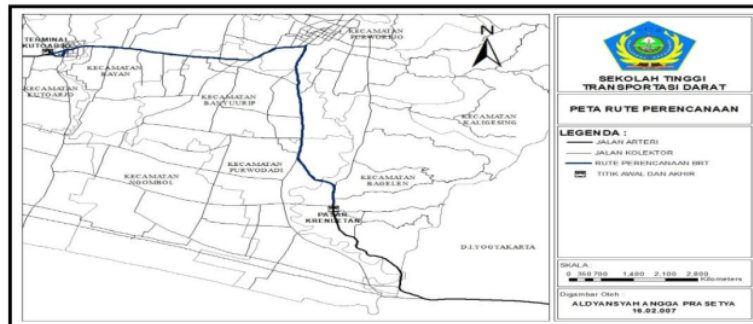
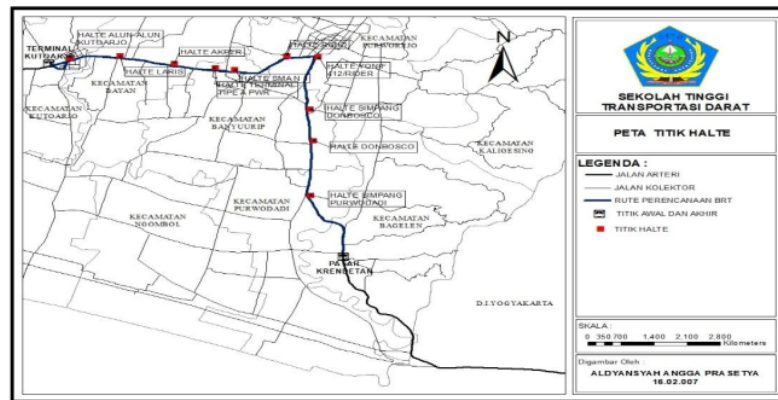


Figure 1 Bus Rapid Transit Plan Map Purworejo Regency

(Source: Primary data processed)

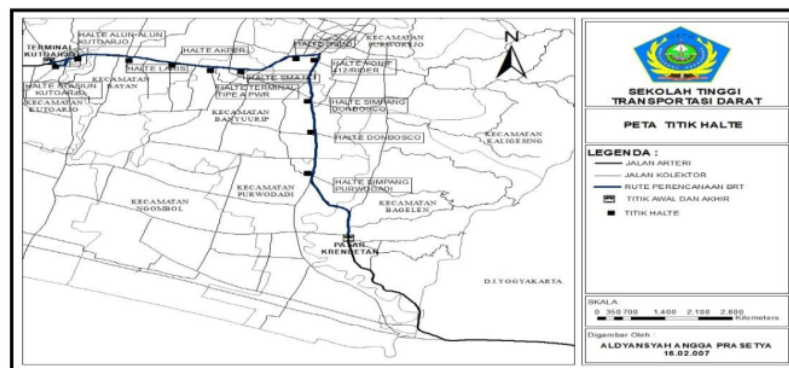
5. The location of stop points for bus stops is planned based on sites that passengers can reach, such as Housing, Schools, Markets, Offices, Stations, Pasar Krendetan, and Terminals. The following can be seen the point of the Purworejo Regency Bus Rapid Transit (BRT) Bus Stop in Figure 1 and Figure 2 the following :



**Figure 2 BRT Stop Point MapPur warejo Regency Departure Route**

(Source: Primary data processed)

With the location of stop points on the route of departure: (1) Terminal Kutoarjo; (2) Kutoarjo Square; (3) Best Selling Department Store; (4) Akper Pemkab Purworejo Regency; (5) Purworejo Type A Terminal; (6) SMKN 1 Purworejo; (7) Dr.Tjitrowardoyo Hospital; (8) Infantry Battalion 412 / Rider; (9) Don Bosco intersection; (10) Don Bosco High School; (11) Purwodadi Intersection; (12) Krendetan Market



**Figure 3 BRT Stop Point Map Purworejo Return Route**

(Source: Primary data processed)

Location of stop points on the return route: (1) Pasar Krendetan; (2) Purwodadi Intersection; (3) Don Bosco High School; (4) Don Bosco intersection; (5) Infantry Battalion 412 / Rider; (6) RSUD dr.Tjitrowardoyo; (7) SMK 1 Purworejo; (8) Purworejo Type A Terminal; (9) Stie Rajawali; (10) Best Selling Department Store; (11) Kutoarjo Square; (12) Kutoarjo Station and (13) Kutoarjo Terminal.

6. Based on the Operational Analysis results for Bus Rapid Transit Planning in Purworejo Regency, the results of operations regarding Travel time, Headway, Lay Over Time are used for scheduling the Bus Rapid Transit Operation in Purworejo Regency. From the potential demand that has a travel time of 40 minutes, a headway of 6 minutes, and a Lay Over Time of 4 minutes at each terminal, an example of schedule is generated, which can be seen in Table 3 below:

**Table 3 Example of Scheduling with Bus Rapid Transit Potential Demo**

| NO    | T.KUTOARJO |      | Bus Stop |      |      |      |       |      |       |      |      |      | PS.KRENDETAN |      |
|-------|------------|------|----------|------|------|------|-------|------|-------|------|------|------|--------------|------|
| Fleet | Arrv       | Dept | AAK      | TL   | AP   | TTA  | SMK 1 | RSUD | Y 412 | SDB  | DB   | SP   | Arrv         | Dept |
| 1     |            | 5:00 | 5:02     | 5:04 | 5:09 | 5:11 | 5:15  | 5:19 | 5:24  | 5:28 | 5:31 | 5:35 | 5:40         | 5:44 |
| 2     |            | 5:06 | 5:08     | 5:10 | 5:15 | 5:17 | 5:21  | 5:25 | 5:30  | 5:34 | 5:37 | 5:41 | 5:46         | 5:50 |
| 3     |            | 5:12 | 5:14     | 5:16 | 5:21 | 5:23 | 5:27  | 5:31 | 5:36  | 5:40 | 5:43 | 5:47 | 5:52         | 5:56 |
| 4     |            | 5:18 | 5:20     | 5:22 | 5:27 | 5:29 | 5:33  | 5:37 | 5:42  | 5:46 | 5:49 | 5:53 | 5:58         | 6:02 |
| 5     |            | 5:24 | 5:26     | 5:28 | 5:33 | 5:35 | 5:39  | 5:43 | 5:48  | 5:52 | 5:55 | 5:59 | 6:04         | 6:08 |
| 6     |            | 5:30 | 5:32     | 5:34 | 5:39 | 5:41 | 5:45  | 5:49 | 5:54  | 5:58 | 6:01 | 6:05 | 6:10         | 6:14 |
| 7     |            | 5:36 | 5:38     | 5:40 | 5:45 | 5:47 | 5:51  | 5:55 | 6:00  | 6:04 | 6:07 | 6:11 | 6:16         | 6:20 |
| 8     |            | 5:42 | 5:44     | 5:46 | 5:51 | 5:53 | 5:57  | 6:01 | 6:06  | 6:10 | 6:13 | 6:17 | 6:22         | 6:26 |
| 9     |            | 5:48 | 5:50     | 5:52 | 5:57 | 5:59 | 6:03  | 6:07 | 6:12  | 6:16 | 6:19 | 6:23 | 6:28         | 6:32 |
| 10    |            | 5:54 | 5:56     | 5:58 | 6:03 | 6:05 | 6:09  | 6:13 | 6:18  | 6:22 | 6:25 | 6:29 | 6:34         | 6:38 |
| 11    |            | 6:00 | 6:02     | 6:04 | 6:09 | 6:11 | 6:15  | 6:19 | 6:24  | 6:28 | 6:31 | 6:35 | 6:40         | 6:44 |
| 12    |            | 6:06 | 6:08     | 6:10 | 6:15 | 6:17 | 6:21  | 6:25 | 6:30  | 6:34 | 6:37 | 6:41 | 6:46         | 6:50 |
| 13    |            | 6:12 | 6:14     | 6:16 | 6:21 | 6:23 | 6:27  | 6:31 | 6:36  | 6:40 | 6:43 | 6:47 | 6:52         | 6:56 |
| 14    |            | 6:18 | 6:20     | 6:22 | 6:27 | 6:29 | 6:33  | 6:37 | 6:42  | 6:46 | 6:49 | 6:53 | 6:58         | 7:02 |
| 15    |            | 6:24 | 6:26     | 6:28 | 6:33 | 6:35 | 6:39  | 6:43 | 6:48  | 6:52 | 6:55 | 6:59 | 7:04         | 7:08 |
| 1     | 6:24       | 6:28 | 6:30     | 6:32 | 6:37 | 6:39 | 6:43  | 6:47 | 6:52  | 6:56 | 6:59 | 7:03 | 7:08         | 7:12 |
| 2     | 6:32       | 6:36 | 6:38     | 6:40 | 6:45 | 6:47 | 6:51  | 6:55 | 7:00  | 7:04 | 7:07 | 7:11 | 7:16         | 7:20 |
| 3     | 6:40       | 6:44 | 6:46     | 6:48 | 6:53 | 6:55 | 6:59  | 7:03 | 7:08  | 7:12 | 7:15 | 7:19 | 7:24         | 7:28 |
| 4     | 6:48       | 6:52 | 6:54     | 6:56 | 7:01 | 7:03 | 7:07  | 7:11 | 7:16  | 7:20 | 7:23 | 7:27 | 7:32         | 7:36 |
| 5     | 6:56       | 7:00 | 7:02     | 7:04 | 7:09 | 7:11 | 7:15  | 7:19 | 7:24  | 7:28 | 7:31 | 7:35 | 7:40         | 7:44 |
| 6     | 7:04       | 7:08 | 7:10     | 7:12 | 7:17 | 7:19 | 7:23  | 7:27 | 7:32  | 7:36 | 7:39 | 7:43 | 7:48         | 7:52 |
| 7     | 7:12       | 7:16 | 7:18     | 7:20 | 7:25 | 7:27 | 7:31  | 7:35 | 7:40  | 7:44 | 7:47 | 7:51 | 7:56         | 8:00 |
| 8     | 7:20       | 7:24 | 7:26     | 7:28 | 7:33 | 7:35 | 7:39  | 7:43 | 7:48  | 7:52 | 7:55 | 7:59 | 8:04         | 8:08 |
| 9     | 7:28       | 7:32 | 7:34     | 7:36 | 7:41 | 7:43 | 7:47  | 7:51 | 7:56  | 8:00 | 8:03 | 8:07 | 8:12         | 8:16 |
| 10    | 7:36       | 7:40 | 7:42     | 7:44 | 7:49 | 7:51 | 7:55  | 7:59 | 8:04  | 8:08 | 8:11 | 8:15 | 8:20         | 8:24 |
| 11    | 7:44       | 7:48 | 7:50     | 7:52 | 7:57 | 7:59 | 8:03  | 8:07 | 8:12  | 8:16 | 8:19 | 8:23 | 8:28         | 8:32 |
| 12    | 7:52       | 7:56 | 7:58     | 8:00 | 8:05 | 8:07 | 8:11  | 8:15 | 8:20  | 8:24 | 8:27 | 8:31 | 8:36         | 8:40 |
| 13    | 8:00       | 8:04 | 8:06     | 8:08 | 8:13 | 8:15 | 8:19  | 8:23 | 8:28  | 8:32 | 8:35 | 8:39 | 8:44         | 8:48 |
| 14    | 8:08       | 8:12 | 8:14     | 8:16 | 8:21 | 8:23 | 8:27  | 8:31 | 8:36  | 8:40 | 8:43 | 8:47 | 8:52         | 8:56 |
| 15    | 8:16       | 8:20 | 8:22     | 8:24 | 8:29 | 8:31 | 8:35  | 8:39 | 8:44  | 8:48 | 8:51 | 8:55 | 9:00         | 9:04 |

Continued from table 3

| NO    | PS.KRENDETAN |      |      | Bus Stop |      |       |      |       | T.KUTOARJO |      |      |      | Arrv | Dept |
|-------|--------------|------|------|----------|------|-------|------|-------|------------|------|------|------|------|------|
| Fleet | Arrv         | Dept | SP   | DB       | SDB  | Y 412 | RSUD | SMK 1 | TTA        | SR   | TL   | AAK  | Arrv | Dept |
| 1     | 5:40         | 5:44 | 5:49 | 5:53     | 5:56 | 6:00  | 6:05 | 6:09  | 6:13       | 6:15 | 6:20 | 6:22 | 6:24 | 6:28 |
| 2     | 5:46         | 5:50 | 5:55 | 5:59     | 6:02 | 6:06  | 6:11 | 6:15  | 6:19       | 6:21 | 6:26 | 6:28 | 6:30 | 6:34 |
| 3     | 5:52         | 5:56 | 6:01 | 6:05     | 6:08 | 6:12  | 6:17 | 6:21  | 6:25       | 6:27 | 6:32 | 6:34 | 6:36 | 6:40 |
| 4     | 5:58         | 6:02 | 6:07 | 6:11     | 6:14 | 6:18  | 6:23 | 6:27  | 6:31       | 6:33 | 6:38 | 6:40 | 6:42 | 6:46 |
| 5     | 6:04         | 6:08 | 6:13 | 6:17     | 6:20 | 6:24  | 6:29 | 6:33  | 6:37       | 6:39 | 6:44 | 6:46 | 6:48 | 6:52 |
| 6     | 6:10         | 6:14 | 6:19 | 6:23     | 6:26 | 6:30  | 6:35 | 6:39  | 6:43       | 6:45 | 6:50 | 6:52 | 6:54 | 6:58 |
| 7     | 6:16         | 6:20 | 6:25 | 6:29     | 6:32 | 6:36  | 6:41 | 6:45  | 6:49       | 6:51 | 6:56 | 6:58 | 7:00 | 7:04 |
| 8     | 6:22         | 6:26 | 6:31 | 6:35     | 6:38 | 6:42  | 6:47 | 6:51  | 6:55       | 6:57 | 7:02 | 7:04 | 7:06 | 7:10 |
| 9     | 6:28         | 6:32 | 6:37 | 6:41     | 6:44 | 6:48  | 6:53 | 6:57  | 7:01       | 7:03 | 7:08 | 7:10 | 7:12 | 7:16 |
| 10    | 6:34         | 6:38 | 6:43 | 6:47     | 6:50 | 6:54  | 6:59 | 7:03  | 7:07       | 7:09 | 7:14 | 7:16 | 7:18 | 7:22 |
| 11    | 6:40         | 6:44 | 6:49 | 6:53     | 6:56 | 7:00  | 7:05 | 7:09  | 7:13       | 7:15 | 7:20 | 7:22 | 7:24 | 7:28 |
| 12    | 6:46         | 6:50 | 6:55 | 6:59     | 7:02 | 7:06  | 7:11 | 7:15  | 7:19       | 7:21 | 7:26 | 7:28 | 7:30 | 7:34 |
| 13    | 6:52         | 6:56 | 7:01 | 7:05     | 7:08 | 7:12  | 7:17 | 7:21  | 7:25       | 7:27 | 7:32 | 7:34 | 7:36 | 7:40 |
| 14    | 6:58         | 7:02 | 7:07 | 7:11     | 7:14 | 7:18  | 7:23 | 7:27  | 7:31       | 7:33 | 7:38 | 7:40 | 7:42 | 7:46 |
| 15    | 7:04         | 7:08 | 7:13 | 7:17     | 7:20 | 7:24  | 7:29 | 7:33  | 7:37       | 7:39 | 7:44 | 7:46 | 7:48 | 7:52 |
| 1     | 7:08         | 7:12 | 7:17 | 7:21     | 7:24 | 7:28  | 7:33 | 7:37  | 7:41       | 7:43 | 7:48 | 7:50 | 7:52 | 7:56 |
| 2     | 7:16         | 7:20 | 7:25 | 7:29     | 7:32 | 7:36  | 7:41 | 7:45  | 7:49       | 7:51 | 7:56 | 7:58 | 8:00 | 8:04 |
| 3     | 7:24         | 7:28 | 7:33 | 7:37     | 7:40 | 7:44  | 7:49 | 7:53  | 7:57       | 7:59 | 8:04 | 8:06 | 8:08 | 8:12 |
| 4     | 7:32         | 7:36 | 7:41 | 7:45     | 7:48 | 7:52  | 7:57 | 8:01  | 8:05       | 8:07 | 8:12 | 8:14 | 8:16 | 8:20 |
| 5     | 7:40         | 7:44 | 7:49 | 7:53     | 7:56 | 8:00  | 8:05 | 8:09  | 8:13       | 8:15 | 8:20 | 8:22 | 8:24 | 8:28 |
| 6     | 7:48         | 7:52 | 7:57 | 8:01     | 8:04 | 8:08  | 8:13 | 8:17  | 8:21       | 8:23 | 8:28 | 8:30 | 8:32 | 8:36 |
| 7     | 7:56         | 8:00 | 8:05 | 8:09     | 8:12 | 8:16  | 8:21 | 8:25  | 8:29       | 8:31 | 8:36 | 8:38 | 8:40 | 8:44 |
| 8     | 8:04         | 8:08 | 8:13 | 8:17     | 8:20 | 8:24  | 8:29 | 8:33  | 8:37       | 8:39 | 8:44 | 8:46 | 8:48 | 8:52 |
| 9     | 8:12         | 8:16 | 8:21 | 8:25     | 8:28 | 8:32  | 8:37 | 8:41  | 8:45       | 8:47 | 8:52 | 8:54 | 8:56 | 9:00 |
| 10    | 8:20         | 8:24 | 8:29 | 8:33     | 8:36 | 8:40  | 8:45 | 8:49  | 8:53       | 8:55 | 9:00 | 9:02 | 9:04 | 9:08 |
| 11    | 8:28         | 8:32 | 8:37 | 8:41     | 8:44 | 8:48  | 8:53 | 8:57  | 9:01       | 9:03 | 9:08 | 9:10 | 9:12 | 9:16 |
| 12    | 8:36         | 8:40 | 8:45 | 8:49     | 8:52 | 8:56  | 9:01 | 9:05  | 9:09       | 9:11 | 9:16 | 9:18 | 9:20 | 9:24 |
| 13    | 8:44         | 8:48 | 8:53 | 8:57     | 9:00 | 9:04  | 9:09 | 9:13  | 9:17       | 9:19 | 9:24 | 9:26 | 9:28 | 9:32 |
| 14    | 8:52         | 8:56 | 9:01 | 9:05     | 9:08 | 9:12  | 9:17 | 9:21  | 9:25       | 9:27 | 9:32 | 9:34 | 9:36 | 9:40 |
| 15    | 9:00         | 9:04 | 9:09 | 9:13     | 9:16 | 9:20  | 9:25 | 9:29  | 9:33       | 9:35 | 9:40 | 9:42 | 9:44 | 9:48 |

7. 5 public transport routes intersect with the Purworejo Regency Bus Rapid Transit Planning route from the survey results. This public transportation will be merged or used as feeder transportation for the Bus Rapid Transit's Planning Routes in Purworejo Regency. With the consideration of the overlap of the Public Transportation route of Purworejo Regency with the Bus Rapid Transit Planning Route.

**Table 4 Merger and Feeder Public Transportation**

| Route Code | Route                                                                                                                                                                                                                                                     | Distance (Km) | Overlapping (Km) | Percentage Overlapping | Description |
|------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|------------------|------------------------|-------------|
| A          | Kutoarjo Terminal – St Tanjunganom – St Kauman – St Marditomo – St P Diponegoro – St Gajah Mada- Terminal Bus Purworejo- St Tentara Pelajar – St Jend Sudirman – St Mayjen Sutoyo – St Jend Urip Sumoharjo – St Veteran – St KHA. Dahlan –Kongsi terminal | 15            | 12               | 55%                    | Merger      |
| B          | Kongsi Terminal – St Pramuka – St KHA Dahlan – St Jend A. Yani – St Jend Urip Sumoharjo – St Bregjen Katamso – Pendowo – Krendetan – Dadirejo                                                                                                             | 20            | 16               | 40%                    |             |
| 19         | Kongsi Terminal - St Pramuka - St KHA Dahlan – St Koloner Sugiyono - St Jend Urip Sumoharjo - St Bregjen Katamso – Donbosco – Pendowo – Purwodadi - Ngombol                                                                                               | 25            | 9                | 26%                    | Feeder      |
| 20         | Kongsi Terminal - St Pramuka - St KHA Dahlan St Koloner Sugiyono - St Jend Urip Sumoharjo - St Bregjen Katamso – Donbosco – Pendowo – Purwodadi – Gesing – Terminal Nampurejo                                                                             | 25            | 15               | 35%                    |             |
| 48         | Terminal kongsi - St Pramuka - St KHA Dahlan – St Koloner Sugiyono - St Jend Urip Sumoharjo - St Bregjen Katamso – Donbosco – Pendowo – Purwodadi - Jogoboyo                                                                                              | 23            | 13               | 23                     |             |

Source: Primary data processed

Public service is an activity that must be carried out in line with the hopes and demands of all citizens. Public services in the form of transportation services are felt directly by the community, especially for land transportation users. So that in implementing the commitment between the central government and local governments in improving land transportation services, it is necessary to face and overcome various challenges in the future (Ministry of Transportation of the Republic of Indonesia, 2011).

The BRT Transport development plan is a project that involves a lot of resources, so it is necessary to have an action plan (RAK) that is systematically and formulated to make it easier to achieve the proper public service goals. The Bus Rapid Transit development project is not the first time in Indonesia. Bus Rapid Transit (BRT), or it can be known as the busway, has been operating for a long time in the Jabodetabek area as a means of integrated mass transportation which is expected to use not only to unravel congestion but also to influence people's interest in shifting away from private vehicles.

From the results of the analysis described above, it is known that the BRT development plan in Purworejo Regency is a form of the government's seriousness in responding to the creation of better public service improvements. Therefore, it is necessary to do a comprehensive study so that it can provide benefits to the community in its implementation. Not only that, the results of this study indicate that the development of Bus Rapid Transit in Purworejo Regency has a relatively high actual demand, which means that the local government can immediately implement this plan.

The idea of developing BRT in Purworejo focuses on several strategic objectives, particularly in sustainably supporting the economic sector. First, BRT can become public transportation that can help existing public transport carry out its role either as a feeder or a merger. As is well known, the presence of new public transit certainly creates anxiety and the existence of previous transit. Therefore, the local government targets BRT operation because this

transportation system is an existing operator not to displace existing ones, but only shift to services that meet minimum service standards.

Second, reduce congestion, accidents, and traffic congestion in the city and city circles. Purworejo Regency is geographically located on two main routes: the Purworejo - Yogyakarta main route and the alternative Jalan Daendels. A double-track railroad has also been constructed from Kutoarjo - Yogyakarta and is in the process between Kutoarjo - Purwokerto. Seeing this condition, it is inevitable that the community's mobility is high, so traffic activities can become congested and trigger traffic accidents (KrJogya.com, 2019).

Third, introduce Purworejo to tourists and develop the economy of the local community (UKM). Purworejo geographically benefited from the inauguration of the New Yogyakarta International Airport (NYIA). This is because the location of Purworejo is directly adjacent to access to/from NYIA airport west of Kulonprogo Yogyakarta (KrJogya.com, 2019). Yogyakarta is one of the potential tourist destinations with a long-term investment visit and is followed by a high demand for public transportation needs. Thus the Purworejo government can take full advantage of this opportunity by constructing facilities and infrastructure in the form of public transportation that is safe, comfortable, affordable, and easily accessible, namely through BRT's operation in its area.

## CONCLUSION

1  
From the research results, it is known that the existing conditions of public transportation in Purworejo Regency are currently considered inferior by the community. The development of integrated public transit in Bus Rapid Transit can be immediately implemented in Purworejo Regency because the survey results show that the number of potential demand and actual fever is relatively high. The presence of BRT is expected to be a means of public transportation that can support other existing vehicles' performance, both making existing public transports as feeders and merging with the planning route of the Bus Rapid Transit in Purworejo Regency. Not only that, for its management to run effectively and efficiently, a study on route development and structuring of BRT management needs to be carried out immediately.

## REFERENCES

1. Ambak, K., Kasvar, K. K., Daniel, B. D., Prasetyo, J., & Abd Ghani, A. R. (2016). Behavioral Intention to Use Public Transport Based on Theory of Planned Behavior. In *MATEC Web of Conferences* (Vol. 47, p. 03008). EDP Sciences.
2. Beirão, G., & Cabral, J. S. (2007). Understanding attitudes towards public transport and private car: A qualitative study. *Transport policy*, 14(6), 478-489.
3. Boyne, G., Entwistle, T., & Ashworth, R. (2010). Theories of Public Service Improvement. *Public Management Review*, 1-15.
4. Cascetta, E., & Carteni, A. (2014). A Quality-Based Approach to Public Transportation Planning: Theory and A Case Study. *International Journal of Sustainable Transportation*, 3(1), 84-106.
5. Detik.com. (2020, Agustus). Pemerintah Diminta Perbaiki Kualitas Transportasi Umum di Masa Pandemi. Retrieved on January 3, 2021. <https://oto.detik.com/berita/d-5140685/pemerintah-diminta-perbaiki-kualitas-transportasi-umum-di-masa-pandemi>.
6. Elmansouri, O., Almroog, A., & Badi, I. (2020). Urban Transportation in Libya: An Overview. *Transportation Research Interdisciplinary Perspectives*, 8, 100161.
7. Geng, Y., Ma, Z., Xue, B., Ren, W., Liu, Z., & Fujita, T. (2013). Co-Benefit Evaluation for Urban Public Transportation Sector—A Case of Shenyang, China. *Journal of Cleaner Production*, 58, 82-91.
8. Glaeser, E. L., Kahn, M. E., & Rappaport, J. (2008). Why do the poor live in cities? The role of public transportation. *Journal of Urban Economics*, 63(1), 1-24.
9. Govinder, K. (2014). A Theoretical Overview of Public Transport Service Quality: A Focus on Bus and Mini-Bus Taxi Service in South Africa. *Journal of Social Sciences*, 3(2), 301-316.
10. Gunawan, I. (2013). *Metode Penelitian Kualitatif*. Jakarta: Bumi Aksara.
11. Hendarto, S. (2001). *Dasar-Dasar: Transportasi*. Bandung: ITB.

12. Holden, E., & Norland, I. T. (2005). Three Challenges for The Compact City As A Sustainable Urban Form: Household Consumption of Energy and Transport in Eight Residential Areas in The Greater Oslo Region. *Urban Studies*, 42(12), 2145-2166.
13. Ionescu, R. (2012). European Union Transport Policy under the Crisis' Impact. *International Journal of Academic Research in Business and Social Sciences*, 2(8), 1-23.
14. Isoraite, M. (2004). Performance Measurement In Transport Sector Analysis. *Transport*, 9(3), 97-107.
15. Karim, Z., & Fouad, J. (2018). Measuring Urban Public Transport Performance on Route Level: A Literature Review. *MATEC Web of Conferences*, 1-10.
16. Khumar, P. P., Parida, M., & Swami, M. (2013). Performance Evaluation of Multimodal Transportation Systems. *Social and Behavioral Sciences*, 104, 795-804.
17. Læssøe, J. (2010). Education for Sustainable Development, Participation and Socio-Cultural Change. *Environmental Education Research*, 18(1), 39-57.
18. Lei, X., Xiao, Y., & Drukker, J. W. (2017). Research of Intelligent Public Transportation Service Design in China. *DEStech Transactions on Environment, Energy and Earth Sciences*, (apeesd).
19. Litman, T. (2020). *Evaluating Public Transit Benefits and Cost: Best Practices Guidebook*. Victoria Transport Policy Institute.
20. Marquez, L., & Pico, R. (2018). Understanding Captive User Behavior in The Competition Between BRT and Motorcycle Taxis. *Transport Policy*, 61, 1-9.
21. Miles, S. (2000). *Youth Lifestyles in A Changing World*. McGraw-Hill Education (U.K.).
22. Nadriana, H., Taghdisi, M. H., Pouyesh, K., Khazaei-Pool, M., & Babazadeh, T. (2019). I Am Sick and Tired of This Congestion": Perceptions of Sanandaj Inhabitants on The Family Mental Health Impacts of Urban Traffic Jam. *Journal Of Transport and Health*, 14, 1-8.
23. Nasution, M. N. (2004). *Manajemen transportasi*. Jakarta : Ghalia Indonesia.
24. Nursyamsu. (2019). *Kajian Kinerja Pelayanan Angkutan Umum Perkotaan*. Retrieved from Tranportasi.
25. Oña, J. D., & Oña, R. D. (2014). Quality of Service in Public Transport Based on Customer Satisfaction Surveys: A Review and Assessment of Methodological Approaches. *Transportation Science*, 1-47.
26. Onatere, J. O., Nwagboso, C., & Georgakis, P. (2014). Performance Indicators for Urban Transport Development in Nigeria. *Urban Transport*, 138.
27. Paulley, N., Balcombe, R., Mackett, R., Titheridge, H., Preston, J., Wardman, M., ... & White, P. (2006). The Demand for Public Transport: The Effects of Fares, Quality of Service, Income and Car Ownership. *Transport policy*, 13(4), 295-306.
28. Peng, Z.-R., Sun, D. J., & Lu, Q.-C. (2012). China's Public Transportation: Problems, Policies, and Perspective of Sustainability. *IJE Journal*, 1-6.
29. Polat, C. (2012). *The Demand Determinants for Urban Public Transport Services: A Review Of The Literature*. Acikerisim.
30. Pratiwi, A., Soedwihajono, S., & Hardiana, A. (2015). Tingkat Kesiapan Kota Surakarta Terhadap Dimensi Mobilitas Cerdas (Smart Mobility) Sebagai Bagian Dari Konsep Kota Cerdas (Smart City). *Region: Jurnal Pembangunan Wilayah dan Perencanaan Partisipatif*, 8(2), 34-41.
31. Rahma, S., Wijayanti, D. A., Ismiyati, I., & Purwanto, D. (2014). Penyediaan Transportasi Umum Masa Depan di Kota Semarang. *Jurnal Karya Teknik Sipil*, 3(1), 154-166.
32. Rahmadana, M. F., Mawati, A. T., Siagian, N., Perangin-angin, M. A., Refelino, J., Tojiri, M. Y., ... & Bahri, S. (2020). *Pelayanan Publik Yayasan Kita Menulis*.
33. Rahmat, M., & Mizokami, S. (2020). Demand and Driver Supply Implications of Regular Public Transportation System for Policy Makers: A Case Study of Kandahar City, Afghanistan. *Transportation Research Procedia*, 48, 2975-2989.
34. Said. (2014). Kinerja Angkutan Umum Oplet (Eksisting) Dan Urgensi Operasionalisasi Angkutan Umum Berbasis Bis yang Memenuhi SPM di Kota Pontianak. *Jember: The 17th FSTPT Jember University*, 22-24 August.
35. Saliara, K. (2014). Public Transport Integration: the Case Study of Thessaloniki, Greece. *Transportation Research*(4), 535-552.

36. Singh, S. K. (2005). Review of Urban Transportation in India. *Journal of Public Transportation*, 8(1), 5.
37. Solecka, K., & Zak, J. (2014). Integration of The Urban Public Transportation System with The Application of Traffic Simulation. *Transportation Research Procedia*, 3, 259-268.
38. Steg, L., & Gifford, R. (2005). Sustainable Transportation and Quality of Life. *Journal of Transport Geography*, 13(1), 59-69.
39. Sudaryanto, S., & Kartikasari, R. (2007). The Measurement of the Service Quality of TransJakarta Public Transportation. In *Proceeding, International Seminar on Industrial Engineering and Management*.
40. Vuchic, V. R. (2002). Urban Public Transportation Systems. *University of Pennsylvania, Philadelphia, PA, USA*, 5, 2532-2558.
41. Weinstock, A., Hook, W., Replogle, M., & Cruz, R. (2011). *Recapturing Global Leadership in Bus Rapid Transit : A Survey of Select U.S. Cities*. ITDP
42. Wirasinghe, S. C., Kattan, L., Rahman, M., & Hubbel, J. (2013). Bus Transit Review. *International Journal of Urban Science*, 17(1), 1-31.
43. Yakimov, M., & Trofimenko, Y. (2018). Developing An Urban Public Passenger Transport Route Network with Account for Natural Resource Limitations. *Transportation research procedia*, 36, 801-809.

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