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ARTICLE

Opportunity of Implementing Buy the Service (BTS) Subsidies for Bus Rapid Transit (BRT) to Improve the Quality of Public Transport Services in Padang Panjang City

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Abstract: This study aims to analyze the cost of subsidies and the opportunity to implement Buy the Service (BTS) for Bus Rapid Transit (BRT) in Padang Panjang City. This study uses a quantitative method with a descriptive approach. Primary data collection includes observation and distribution questionnaires with respondents using public and non-public transport users. The information obtained from the distribution of questionnaires is the origin of the destination, characteristics of public transportation behavior, and the willingness to pay of the community towards public transportation modes that follow public transportation service standards. The operational costs of public vehicles are obtained from the survey results of the basic costs of public transportation, which consist of direct and indirect costs. The results of this study formulate 3 (three) main route trajectories scenarios and cost analysis of BTS implementation that meets Minimum Service Standards (SPM). The estimated subsidy cost for implementing BTS in the three main corridors is 10.09 billion, with the highest subsidy cost being in corridor 1. which is 4.41 billion but has a smaller headway than the other two corridors. The results of this study also recommend the need for continuous socialization to the community regarding the ease and convenience of using BRT as well as equalizing perceptions between local governments and operators regarding the mechanism for providing BRT subsidies.

Keywords: Buy the Service (BTS); service quality; BRT public transport.

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1. Introduction

This study aims to analyze the opportunities for the Buy the Service (BTS) concept to be applied in small cities with dense motorized vehicles and high-intensity Sumatran roads, such as Padang Panjang City. Padang Panjang City is a small city in West Sumatra Province with an area of 23 km2 or 0.05% of the total area of West Sumatra Province, with a population of 56,971 people. In 2021, there will be an 8.8 percent increase in ownership and use of private vehicles compared to 2020 (Statistics of Padang Panjang Municipality, 2021), resulting in traffic jams or a decrease in road performance (Momon, 2013). This is a result of improving socioeconomic conditions (Kusuma et al., 2018) and also driven by the poor quality of public transportation services so that people prefer private vehicles to public transportation.

The low interest of the people of Padang Panjang City in using public transportation is a problem in the development of public transportation, which is actually also experienced by many cities in Indonesia (Hörcher & Tirachini, 2021; Widayanti et al., 2014). In fact, for a long time, the direction of the national transportation development policy has been to develop public transportation throughout Indonesia.

Based on data from the Padang Panjang City Transportation Service in 2019, there was a decrease in the number of public transport passengers by 23% compared to 2013. This is in line with the results of preliminary observations in 2019, where the average number of passengers (Load Factor) was only 46.38 %. The decline in the number of public transport passengers is a major problem in the public transportation sector in the city of Padang Panjang.

The decrease in public transport passengers in Padang Panjang City is due to the long waiting time, which ranges from 15–30 minutes. This duration is longer than the standard set by the Directorate General of Land Transportation i.e., on average by 5–10 minutes. In addition, the physical condition of the currently operating public vehicles is not feasible where the age of the currently operating vehicles is more than ten years. Another problem is the reckless behavior of drivers fighting over passengers causing passenger discomfort. In addition, the increasing number of other better transportation options, such as online and base motorcycle taxis that offer various conveniences, causes public transportation to lose the competition. This is in line with the results of preliminary observations in 2019, which showed that people prefer private vehicles to public transportation because they are more flexible and comfortable.

Therefore, the government is obliged to take a role in making public transportation the community's first choice through the provision and management of public transportation service infrastructure as one of the fulfillments of Minimum Service Standards (SPM) in the transportation sector. Transportation MSS cannot be carried out with a free-market mechanism because it tends to create market failures which result in market mechanisms not working efficiently and ultimately causing externalities (Cowie, 2021). One form of innovation to reduce the effects of market failure and efforts to fulfill SPM is the concept of providing a Buy Service (BTS) subsidy on Bus Rapid Transit (BRT).

The BTS concept is a form of innovation to encourage service improvements aimed at increasing the use of public transportation (Ferza et al., 2019; Wahyudi, 2016). Buy the service (BTS) is a subsidy mechanism known for providing subsidies for public transportation or purchasing services for urban public transportation, which aims to stimulate the development of urban public passenger transportation and increase interest in using public transportation. BTS also aims to provide convenience for community mobility in urban areas and to fulfill the SPM for public transportation (Priyandono et al., 2021). Through the BTS mechanism, the government can influence and control public transport operators so that their behavior will align with government goals (Vigren, 2021). This is also in accordance with the government's authority contained in Article 158 of Law Number 22 of 2009 concerning Road Traffic and Transportation.

Implementing Public Transportation with the Buy the Service concept requires subsidies to finance its operation. Public transport subsidies provided by the government to public transport operators aim to encourage increased production and consumption (Prayudyanto, 2021). The provision of subsidies will have an impact on reducing transport fares, increasing production and demand, as well as being a mechanism for income redistribution and a safety net for those who do not have access to better alternatives (Abrantes, 2015; Gwilliam, 2008). Arranz et al. (2022) and Cadena et al. (2016) found that low-income residents benefited more from fare reductions through subsidizing public transport mechanisms. Specifically, Guzman and Hessel (2022) found that the provision of subsidies can improve welfare through increasing access to the labor market and tourism places. Implementing Public Transportation with the Buy the Service concept requires subsidies to finance its operation. Public transport subsidies provided by the government to public transport operators aim to encourage increased production and consumption (Prayudyanto, 2021). The provision of subsidies will have an impact on reducing transport fares, increasing production and demand, as well as being a mechanism for income redistribution and a safety net for those who do not have access to better alternatives (Abrantes, 2015; Gwilliam, 2008). Arranz et al. (2022) and Cadena et al. (2016) found that low-income residents benefited more from fare reductions through subsidizing public transport mechanisms. Specifically, Guzman and Hessel (2022) found that the provision of subsidies can improve welfare through increasing access to the labor market and tourism places.

Many studies related to the application of BTS have been carried out. Research results (Prayudyanto, 2021) in two big cities in Indonesia, such as Medan and Denpasar, found that the BTS program is a solution to reduce government subsidies and improve public transport services. Next, Priyandono et al. (2021) found that TEMAN Bus with BTS Program in the Surabaya City Terminal-Kenjeran route can be implemented economically and financially. This research is different from previous research, which took place in big cities, while this research was conducted in small towns with different characteristics from big cities.

2. Methods

This study uses a quantitative method with a descriptive approach. According to Arikunto (2016), This research collects, analyzes, and displays the results in numbers. Primary data collection includes observation and distributing questionnaires with respondents using public transportation and non-public transportation using an accidental sampling technique. Information obtained from the distribution of questionnaires is the potential demand, the origin of destination, characteristics of public transportation behavior, and the willingness to pay off the community for public transportation modes that are in accordance with public transportation service standards. To obtain the Operational Cost of Public Transport Vehicles, the researcher also surveyed basic costs consisting of direct costs and indirect costs of public transportation based on the Regulation of the Minister of Transportation Number KM 52 of 2006 concerning Amendments to the Decree of the Minister of Transportation Number KM 89 of 2002 concerning Mechanisms for Determining Tariffs and Formula for Calculation of Cost of Transportation of Passengers by Economy Class Intercity Public Bus.

The data obtained from the primary survey aims to analyze the route plan based on the trend line from the origin of the trip destination. The Willingness to Pay analysis is first carried out to calculate the potential demand and the cost of subsidies issued by the government. The WTP method is used to see several options between different price and quantity combinations or, in its implementation, the extent to which people can afford to take new public transportation and calculate the Vehicle's Operational Cost (BOK) as research by Ropika (2018) and Saputra et al. (2021).

3. Results and Discussion

The BTS scenario design in the context of developing public transportation in the city of Padang Panjang begins with analyzing the demand for public transportation. The analysis of demand for public transportation aims to calculate the potential of the community to use public transportation BTS by analyzing the data on the pattern of people traveling per day, which is poured into the matrix of origin and destination (Origin-Destination) between urban villages as shown in Table 1.

3.1. Analysis of Demand for Public Transportation Service Users in Padang Panjang City

3.1.1. Public Transport Demand Analysis

The analysis of public transport demand results based on a survey indicates that the travel pattern shows the demand for public transport service users in the city of Padang Panjang is 13,423 people per day (see Table 1). The highest generation is found in zones 14, 5, and 2, while the highest attraction is zones 1, 14, and 4, which are the center of government and trade in the city center. These findings support research

Table 1. Padang Panjang Public Transportation Travel Routes

	Zone	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	Total
1	Ps. Baru	0	53	48	81	70	89	44	25	98	86	58	45	30	122	29	32	910
2	Balai-Balai	110	0	89	98	33	61	39	57	57	84	58	46	38	193	29	13	1006
3	G. Malintang	198	70	0	104	32	7	15	31	38	29	37	26	24	97	26	14	747
4	Tn. Lambik	352	71	37	0	29	47	18	28	45	23	119	32	24	77	37	22	962
5	Kt. Panjang	409	55	23	47	0	99	9	89	43	51	62	99	29	32	25	12	1086
6	Kp. Manggis	189	35	12	90	109	0	18	26	30	33	65	19	19	75	26	12	758
7	Tn. Hitam	190	77	39	74	33	39	0	148	68	55	31	31	29	77	71	14	977
8	Ps. Usang	294	71	38	28	42	28	20	0	33	28	18	12	19	202	20	40	896
9	Silaing atas	172	53	37	93	25	54	26	123	0	65	40	76	17	80	39	35	934
10	Bk. Surungang	244	56	46	76	14	27	31	71	27	0	31	15	11	67	19	16	750
11	Ganting	242	80	65	77	20	87	16	27	29	37	0	66	11	18	83	54	912
12	Ngalau	296	17	8	21	73	8	9	51	41	64	147	0	15	25	30	35	842
13	Koto Katik	98	29	19	23	15	11	6	11	11	15	16	7	0	12	17	8	298
14	Silaing Bawah	186	207	96	155	40	25	56	215	67	59	83	47	22	0	58	26	1342
15	Sigando	130	54	29	37	34	17	24	23	30	18	80	44	24	27	0	39	610
16	Ekor Lubuk	84	26	14	20	23	12	13	24	27	15	42	44	7	11	33	0	393
	Total	3196	956	598	1024	594	611	343	951	645	661	888	607	318	1116	543	372	13423

Source: *Processed by the Author, 2022*

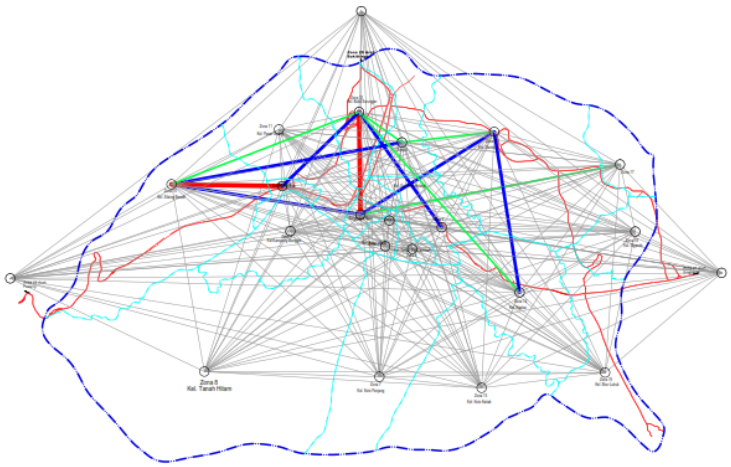

Figure 1. Travel Movement Trendline

(Hidayat et al., 2022), who found that the main destinations of transportation users are businesses and shopping centers (see Figure 1). Furthermore, Figure 1 shows the distribution of activity centers such as government offices, schools, and markets, and transportation nodes (terminals and stations) are also concentrated in zone 1 and zone 2.

3.1.2. Analysis of the Route Plan

The public transport route plan in Padang Panjang City is prepared based on the consideration of several factors, namely urban travel patterns (OD Matrix), population density distribution, distribution of transportation nodes, route network patterns, and road geometry (minimum width of 6 meters). Based on the consideration of these factors, the route network that can be proposed for planning the Main Route Public Transport is shown in Table 2 and Figure 1.

Table 2. BRT Transport Route Network Plan

	Corridor	Route	Route Length
1	Corridor 1	City Boundaries (Pdg. Panjang–Solok) -> Jalan Raya Solok–Pdg. Panjang -> Jalan Sudirman -> Jalan Sukarno-Hatta -> Jalan M. Yamin -> Term. Type C -> Jalan Sukarno-Hatta -> Jalan S. M. Daud Rasyidi -> Term. Type B -> Jalan M. Yamin -> Jalan Sudirman -> Jalan Raya Solok–Pdg. -> City Boundaries	13.12 Km
2	Corridor 2	City Boundaries (Pdg. Panjang–Pdg. Pariaman) -> Jalan Sutan Syahrir -> Jalan M. Yamin ->Term. Type C -> Jalan Sukarno-Hatta -> City Boundaries (Pdg. Panjang–Bukittinggi) -> Term. Type B Pdg. Panjang -> Jalan Syekh M. Daud Rasyidi -> Jalan Sutan Syahrir -> City Boundaries (Pdg. Panjang–Pdg. Pariaman)	13.91 Km
3	Corridor 3	City Boundaries (Pdg. Panjang–Solok) ->Jalan Bypass Pdg. Panjang -> RSUD Padang Panjang -> Jalan Perintis Kemerdekaan -> Jalan KH Agus Salim -> Jalan Sudirman -> Jalan M Yamin -> Term. Type C -> Jalan S. M. Daud Rasyidi -> Term. Type B -> Jalan Prof. Hamka -> Jalan Bypass Pdg. Panjang -> RSUD Pdg. Panjang -> Jalan Bypass Pdg. Panjang Bypass Boundaries (Pdg. Panjang–Solok)	15.74 Km

Source: *Processed by the Author, 2022*

Table 2 shows the longest BRT transportation route is corridor 3, with a route length of 15.74 km, and the shortest route is corridor one which is 13.12 km. Although it is the shortest route, Figure 1 shows that Corridor 1 is the downtown area which is the center of daily community activities for work, school, and the market.

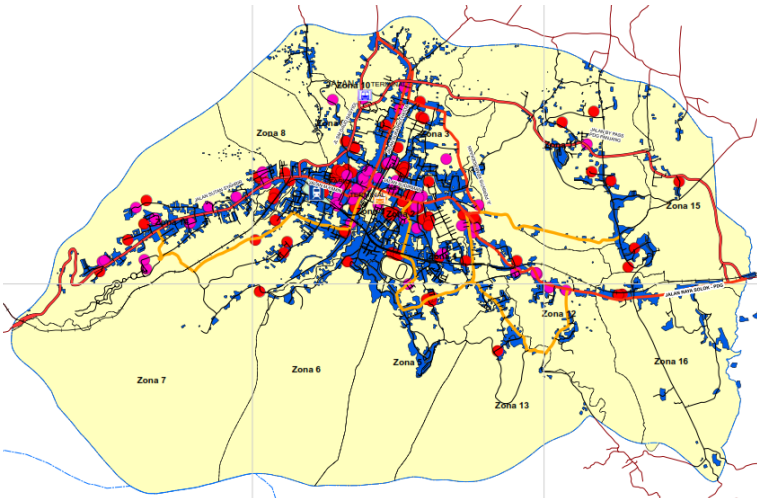

Figure 2. BRT Route Network, Density, and Distribution of Activity Centers

3.2. Potential Demand for BRT Transport and Operational Plan

Public transportation with the BRT system aims to attract people to use public transportation modes and reduce congestion and other negative impacts of using private vehicles (Andrew et al., 2022; Emileo et al., 2017). In designing the BTS scenario with the BRT system, it is necessary to know the potential demand that can be seen from the mode shift from microbuses to the offered transportation (Yaldi et

al., 2019). Mode shift is the selection of available public transportation to support the mobility of users or travelers (Artanto, 2018). Mode switching is influenced by various factors such as age, occupation (Ependi, 2021), comfort, ownership of a private vehicle, ownership of a driver's license, perceptions of comfort and cost (Rahayu, 2021).

To calculate the potential demand for BRT (MPU to BRT shift mode), the researcher uses Willingness to Pay (WTP) analysis where this analysis is the community's preference in choosing to switch to BRT or continue to use the existing public transport mode (MPU) with the service indicators offered are fixed vehicle headway, not so long waiting time, air-conditioned vehicles, loose recleaning sheets, and affordable rates. This indicator represents the quality of service expected by the public from public transportation (Nadeem et al., 2021). The analysis of willingness to pay can be seen as follows:

3.2.1. Willingness to Pay (WTP)

Based on the analysis of willingness to pay, the following results are obtained:

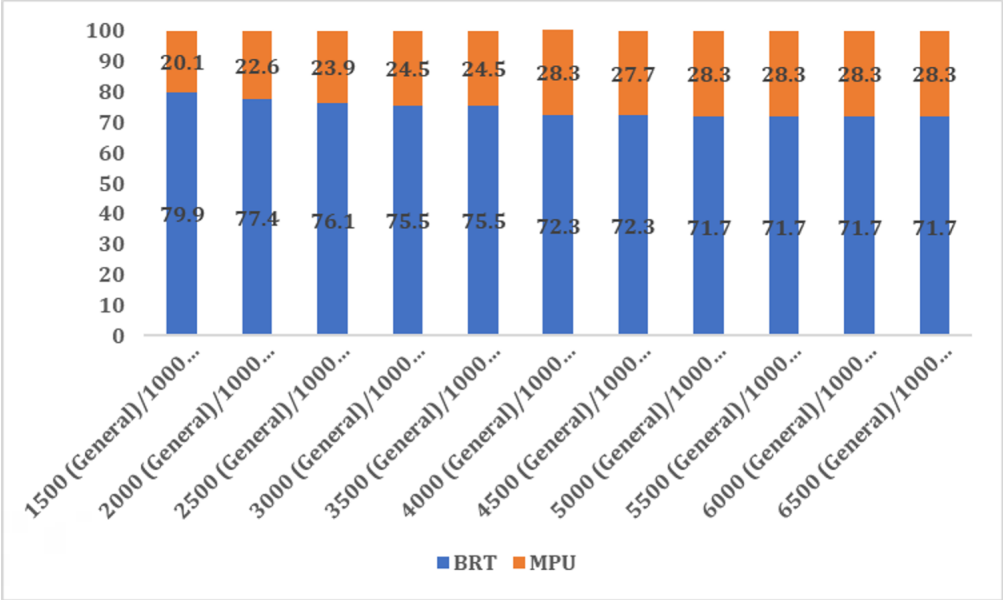

Figure 3. BRT Route Network, Density, and Distribution of Activity Centers

Based on Figure 3, the shift mode occurs in the range of 79.87%–71.70% based on the rates offered to respondents. The biggest potential demand is when the ticket price for BRT is IDR1500 (for the general category), while the student category is still IDR1000 with a shift mode of 79.98%. The potential demand for BRT will decrease slightly if the ticket price is increased to IDR2000. The decrease tends to occur linearly if a multiple of IDR6000 increases the BRT ticket price. The biggest decrease was when the BRT ticket price was increased to IDR4000. Furthermore, the potential demand for BRT tends to stagnate if the ticket price is increased to IDR5000–IDR6500.

3.2.2. Estimated BRT Passenger

Based on the OD matrix data (Table 1) and the estimated shifting from MPU to BRT in (Figure 3), the potential demand for BRT transportation can be obtained. The potential passengers for each corridor can be seen in Table 3. The potential demand for the third (three) corridor BRT transportation is 10,738 passengers. The highest potential for passengers is located in the 1 (one) traffic corridor and the City Boundaries (Padang Panjang-Solok) -> Jalan Raya Solok-Padang Panjang -> Jalan Sudirman -> Jalan M. Yamin -> Term. Type C -> Jalan S. M. Daud Rasyidi -> Term. Type B -> Jalan Sukarno Hatta -> Jalan Sudirman -> Jalan Raya Solok–Padang Panjang -> City Boundaries, with a potential passenger of 4,560 passengers. While the smallest is in the corridor 3 lanes of the City Boundaries (Padang Panjang-Solok) -> Jalan Bypass Padang Panjang

-> RSUD Padang Panjang -> Jalan Perintis Kemerdekaan -> Jalan KH Agus Salim -> Jalan Sudirman -> Jalan M Yamin -> Term. Type C -> Jalan S. M. Daud Rasyidi -> Term. Type B -> Jalan Prof Hamka -> Jalan Bypass Padang Panjang -> RSUD Padang Panjang -> Jalan Bypass Padang Panjang -> City Boundaries (Padang Panjang-Solok) with a potential passenger of 2,646 passengers. This potential demand will increase when private vehicle users switch to BRT transportation.

Table 3. Estimation of BRT Passengers

	Corridor	Estimated BRT Demand (Passengers)	Route Length (M)
1	Corridor 1	4,560	13,125
2	Corridor 2	3,532	13,915
3	Corridor 3	2,646	15,742
	Total	10,738	

3.2.3. Total Fleet Needs and Operation Plan

Fleet needs and operational plans are determined after obtaining potential demand to know how much expenditure is borne by the Government of Padang Panjang City in implementing BTS. The need for the number of fleets and other operational performance indicators (Capacity, Headway, Circulation Time, frequency) can be seen in Table 4.

Table 4. Fleet Amount Requirement and BRT Operation Plan

	Corridor	Route Tracks	Capacity (Person)	Headway (Minute)	Circulation Time (Minute)	Total Fleet (Unit)	Frequency (Vehicle/Hour)
1	Corridor 1	City Boundaries (Pdg. Panjang-Solok) -> Jalan Raya Solok–Pdg. Panjang -> Jalan Sudirman -> Jalan Sukarno-Hatta -> Jalan M. Yamin -> Term. Type C -> Jalan Sukarno-Hatta -> Jalan S. M. Daud Rasyidi -> Term. Type B -> Jalan M. Yamin -> Jalan Sudirman -> Jalan Raya Solok–Pdg. Panjang -> City Boundaries	30	3.32	46.69	14	18
2	Corridor 2	City Boundaries (Pdg. Panjang–Pdg. Pariaman) -> Jalan Sutan Syahrir -> Jalan M. Yamin ->Term. Type C -> Jalan Sukarno-Hatta -> City Boundaries (Pdg. Panjang–Bukittinggi) -> Term. Type B Pdg. Panjang -> Jalan Syekh M. Daud Rasyidi -> Jalan Sutan Syahrir -> City Boundaries (Pdg. Panjang–Pdg. Pariaman)	30	4.28	43.87	10	14
3	Corridor 3	City Boundaries (Pdg. Panjang–Solok) ->Jalan Bypass Pdg. Panjang -> RSUD Padang Panjang -> Jalan Perintis Kemerdekaan -> Jalan KH Agus Salim -> Jalan Sudirman -> Jalan M Yamin -> Term. Type C -> Jalan S. M. Daud Rasyidi -> Term. Type B -> Jalan Prof. Hamka -> Jalan Bypass Pdg. Panjang -> RSUD Pdg. Panjang -> Jalan Bypass Pdg. Panjang Bypass Boundaries (Pdg. Panjang–Solok)	30	5.71	45.61	8	11

Source: *Processed by the Author, 2022*

3.3. Calculation of the Cost of Implementing BTS on BRT

The cost of implementing BTS on BRT is the difference between BRT operational costs and BRT Operational Revenue Costs. BRT operational costs consist of direct costs and indirect costs. The direct cost components consist of depreciation costs, capital interest costs, vehicle/bus crew costs, fuel costs, tire costs, vehicle maintenance/repair costs, route permit fees, vehicle registration fees (STNK), and bus keur costs. Meanwhile, the indirect cost component consists of annual employee costs, management fees, and the total cost per passenger/km. Meanwhile, BRT's operating income is an estimated income derived from the prevailing tariffs.

Table 5. Operational Costs for Operating Medium BRT Buses

	Track Corridor	Total Fleet	BOK/Km	Miles of Service/Year	Total
1	Corridor 1	14	8,471.95	608,728.8	7,042,605,651.16
2	Corridor 2	9	9,809.12	323,260.4	4,860,209,419.89
3	Corridor 3	8	10,740.29	255,736.5	4,401,462,772.87
			Total		16,304,277,843.92
			Value Added Tax (10%)		1,630,427,784.39
			Total		**17,934,705,628.31**

Source: *Processed by the Author, 2022*

3.3.1. BRT Operational Costs

The costs incurred by the Municipal Government of Padang Panjang to operate BRT with the BTS scheme are estimated to be IDR17.93 billion. The biggest subsidy is in the corridor of track one, namely IDR7.04 billion. Meanwhile, in corridor two, IDR4.8 billion and three corridors of IDR4.4 billion.

3.3.2. BRT Operating Income

BRT's operating income amounted to IDR7.83 billion, with details of corridor line one at IDR3.32 billion, route two at IDR2.57 billion, and route three at 1.93 billion (Table 6). The BRT income is an estimate of the income that will be obtained when the Minimum Service Standards (SPM) are implemented properly and consistently in terms of the physical aspect of the vehicle, comfort, safety, and operation.

Table 6. BRT Operating Income

Track Corridor		Passenger		Revenue/Day		Revenue/Year		Total
		General	Student	General	Student	General	Student	
1	Corridor 1	2,280	2,280	6,839,651	2,279,884	2,496,472,489	832,157,496	3,328,629,985
2	Corridor 2	1,766	1,766	5,298,320	1,766,107	1,933,886,747	644,628,916	2,578,515,662
3	Corridor 3	1,323	1,323	3,969,727	1,323,242	1,448,950,211	482,983,404	1,931,933,614
				Total				7,839,079,262

Source: *Processed by the Author, 2022*

3.3.3. Cost of Implementing Buy the Service

The cost of implementing subsidies on each route, as illustrated in Table 9, is obtained after calculating income and expenses. Table 7 shows the cost of implementing BTS for all corridors of IDR10.09 billion, with the highest cost found in corridor one, which is IDR4.41 billion.

Table 7. Cost of Implementing Buy the Service

Kind of Service		Expenses + 10% Value Added Tax	Revenue	Cost of BTS
1	Corridor 1	7,746,866,216	3,328,629,985	4,418,236,231
2	Corridor 2	5,346,230,362	2,578,515,662	2,767,714,699
3	Corridor 3	4,841,609,050	1,931,933,614	2,909,675,436
	Total	17,934,705,628,31	7,839,079,262	10,095,626,366.21

Source: *Processed by the Author, 2022*

Table 7 shows that the initial cost of implementing BTS that the Padang Panjang City government must allocate to meet the Minimum Service Standards (SPM) for public transportation is quite large. However, the cost of subsidies will decrease along with the increase in public demand for public transportation, especially if the agency responsible for providing services innovates in order to increase revenue, such as renting advertisements or making attractive promos to attract public interest.

However, this must be accompanied by increased service quality so that the community gets representative services according to user requests. Improving public service quality can be improved by improving service quality management (Wahyudianto, 2015), thus providing satisfaction to society. Better public transport services have the potential to attract private vehicle users to switch to public transport, thereby reducing the external impact of motorized vehicles (Wicaksono, 2012).

This condition shows the enactment of the Mohring effect, which states that an increase in the frequency of public transport services will reduce public costs for users in the form of decreased waiting times, increasing in demand, and a decrease in the average cost of public transport users. This is proven by Silva (2019), who shows that the Mohring effect is quite large and plays a key role in justifying the existence of subsidies for public transport.

3.4. Potential Application of BTS on BRT in Padang Panjang City

3.4.1. Knowledge of BRT Services and Community Response to the Implementation of BRT With the BTS Scheme

Most of the respondents (91.19%) know about BRT (such as Trans Padang) as a mode of urban public transport services. It seems that print and electronic media are currently playing a large role in providing information and increasing public knowledge so that they are quite familiar with the terms and services of mass public transportation, and conversely, 8.81% of respondents said they did not (yet) know about BRT mass transit as illustrated in Figure 4.

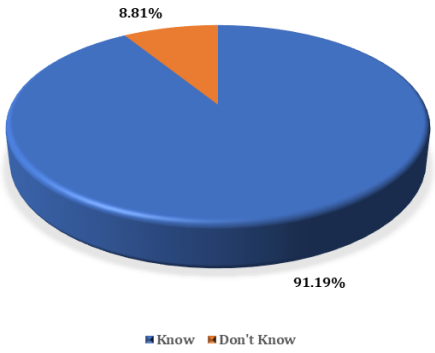

Figure 4. Characteristics of Respondents Based on Knowledge About BRT Transportation

With regard to respondents' support for the implementation of the BRT program in Padang Panjang City, 91.82% of respondents said they supported the implementation of this program, and the remaining 8.18% of respondents did not support it. Data on support for the BRT mass transit program in Padang Panjang City (91.82%) is slightly higher than knowledge regarding BRT transport services in general (91.19%). This is a positive indication for a new program in BRT development through the Buy the Service (BTS) scheme, as illustrated in Figure 5.

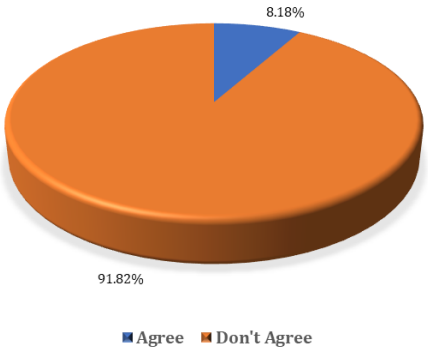

Figure 5. Characteristics of Respondents Based on Knowledge About BRT Transportation

3.4.2. Variables/Indicators That Need to Be Considered in the Implementation of BRT Services With the BTS Scheme

This study found that several things must be considered in implementing BRT services with the BTS scheme. The first is the consideration that forms the basis of respondents choosing public transportation. The study results found that as many as 39.62% of respondents chose public transportation due to lower cost considerations and 23.23% of respondents because they did not have private vehicles. Conversely, for respondents who did not use public transportation because of the waiting time, 45.78%, the travel time was long, 9.04%, and they felt insecure and comfortable, as much as 13.86%. Consideration of the decision to use and not use public transportation is the basis for implementing BRT services with the BTS scheme.

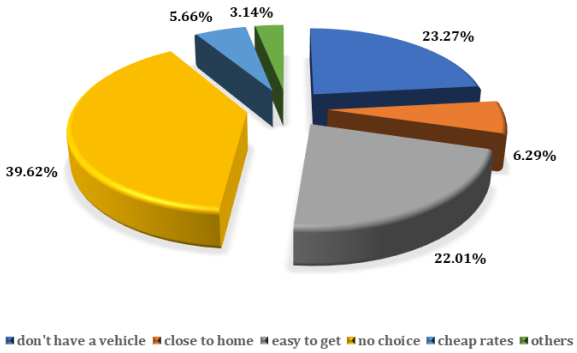

Figure 6. Considerations for Not Using Public Transportation

Second, the provision of disability facilities should be accommodated in every public service, including public transportation. The results showed that 96.86% of respondents agreed with equal service to all public transport users by providing seats for passengers with special needs or disabilities. Third, a faster waiting time for BRT services is highly expected by most respondents (96.23%). The expected waiting time is less than 15 minutes. This finding is in line with the respondents' considerations in choosing public transportation.

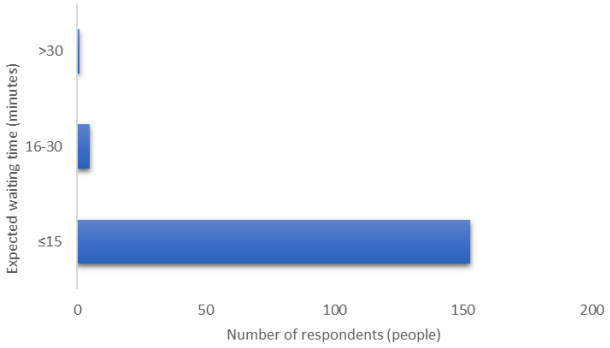

Figure 7. Characteristics of Respondents Based on Waiting Time for BRT Transportation

3.5. Implementation of the Buy the Service (BTS) Policy for Bus Rapid Transit (BRT)

BRT is a means of transportation that meets the standards of comfort, safety, speed, and relatively low prices (Lubis et al., 2018; Priyanto, 2018). However, in addition to customer satisfaction, several findings also show that the utilization of BRT is not optimal, with one of the results showing the utilization rate is in the range of fifty percent (Agustien et al., 2022; Istianto et al., 2021; Nadeem et al., 2021). One of the reasons for the lack of use of BRT is the lack of outreach from the government and unsatisfactory service from bus officers to passengers (Lubis et al., 2018), and inadequate infrastructure and route lines (Nadeem et al., 2021). Therefore, several BTS policies on BRT need to be optimized as described below:

3.5.1. Operating Policy

The operating policy includes drafting tender-based regulations and establishing public transport service standards.

a. The preparation of tender-based operating regulations regulates the criteria, terms, and mechanism of contract agreements agreed upon with operators. Tenders are open and transparent to create healthy competition between operators and a market price mechanism for vehicle operating costs. Contract agreements are valid for 4 to 6 years, with annual technical and administrative evaluations carried

out. Each route will have its contract and is unique because it will be adjusted to the field conditions of each route. Operators are only paid according to operational performance specified in the specifications. If during the implementation of the contract, there is a breach/infringement committed by the operator both on the quantitative and qualitative aspects, it may result in the imposition of a fine. When the contract period expires, the operator must return the routes it serves to the government, and then the government will re-tender.

The licensing mechanism can be seen as follows:

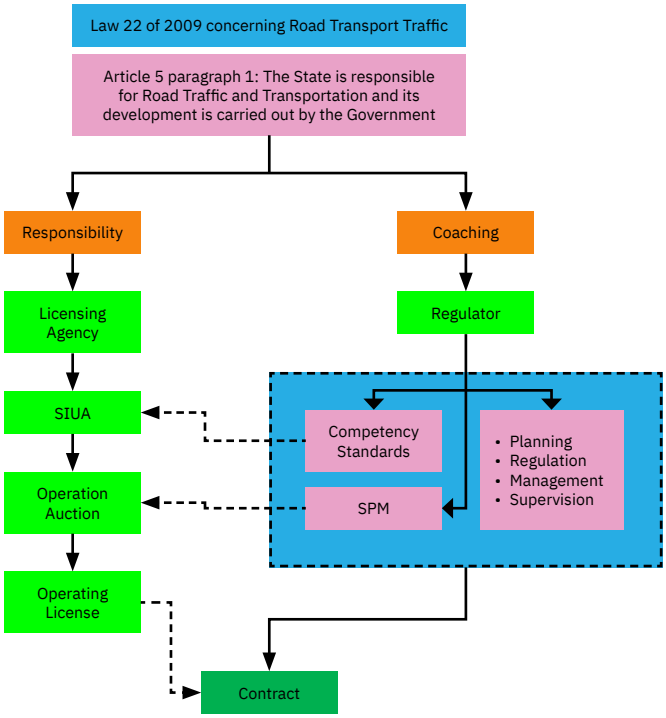

Figure 8. Entrepreneurship and Licensing of Public Transportation With a Tender/ Auction Mechanism

The route auction mechanism has been stated in Law Number 22 of 2009. The principle of this route auction is to provide the widest possible opportunity for transport companies that meet the requirements to participate in the auction. If the winner has been selected, it is bound by a contract agreement that includes rights, obligations, and sanctions so that the operation of the combiner transport can run in accordance with the work contract.

b. The next effort is to set service standards as stipulated in the Regulation of the Minister of Transportation of the Republic of Indonesia, No. 10 of 2012 concerning minimum service standards for road-based mass transit.

3.5.2. Imposition of Sanctions

In order to maintain the quality of service properly, in addition to the sanctions stipulated in the applicable laws and regulations, sanctions will also be included in the tender process. Types of sanctions that will be given, among others:

a. Prohibition of operations for a certain period of time;

b. Fines;

c. License revocation and re-tendering.

3.5.3. Management Institution

Institutions responsible for managing BRT transportation under the BTS scheme are adjusted to the policy directions and regional financial capabilities. Several choices of management institutions include:

a. Managed by a public institution specifically tasked with managing the BRT public transport system based on service SOPs and SPMs. Examples of mass transportation managers in Indonesia today are the Trans Semarang Public Service Agency (BLU) or the regional company (BUMD) PT. Jakarta Transportation or better known as Trans Jakarta.

b. Public institutions that work with partners who become operators or banking parties (Lumangkun et al., 2021). Besides that, it can carry out various technology-based innovations to improve transportation services that are fast, safe, cheap, and comfortable (Dewi & Setianingsih, 2018).

The BTS concept with BRT should be applicable in Padang Panjang City, with the vehicle capacity suitable for a city with a relatively small population. For this program to run effectively and efficiently, ongoing outreach to the community is needed regarding the ease and convenience of using BRT. Furthermore, an understanding is needed regarding cooperation and the mechanism for providing subsidies to operators who run BRT. Reward and punishment mechanisms can be applied so that operators can provide optimal service to users of public transportation services (BRT).

The working relationship between the Management Office and the operator is the relationship between the employer and the operator, which is bound by a contract agreement. In the contract, it is agreed that the value of the "buy the service" payment is in the form of a fee per bus per km and Minimum Service Standards (SPM) that the operator must implement. The contract also agrees on rights and obligations as well as sanctions for violations of the provisions stipulated by the contract. The following is a picture of the working relationship between the Padang Panjang City Government, represented by the Padang Panjang BRT BLUD, and the operator. The operational cooperation between the Padang Panjang BRT BLUD and the operator regulates the institutional scheme and funding scheme, as shown in the following figure.

4. Conclusion

Estimating subsidy costs is obtained by analyzing demand for public transport based on an analysis of willingness to pay and potential revenue and operational costs of BRT transportation using the BTS scenario. Demand for BRT public transport is 71–79% with a fare of IDR1,500–IDR6,500. Furthermore, there is a demand reduction when the assumption of a tariff increases up to Rp. 6,500, but the number of requests is still large at 71.7%.

Based on urban travel patterns (OD Matrix), distribution of population density, distribution of transportation nodes, route network patterns, and road geometrics (minimum width of 6 meters), three scenarios of routes or main route corridors are defined that intersect or meet each other in the city center or Central Business District (CBD) Padang Panjang City. The main corridor has the shortest route (13.12 km), while the longest is corridor three (15.73 km). The study results found that there was a tendency for travel patterns to be centered on corridor one and corridor two and the distribution of activity centers located on the main roads.

The subsidy cost of implementing BTS on BRT in Padang Panjang City on 3 (three) main corridors calculated based on estimated revenue and operational costs is 10.095 billion. The subsidy for the first track corridor is IDR42 billion, the second corridor is IDR2.77 billion and third corridors IDR2.9 billion. The largest subsidy for the use of BTS is in the corridor for line one, and this is because it is the busiest and busiest route to the city center.

Based on considerations of demand analysis, planned main route routes, and subsidy costs for implementing BTS on BRT in Padang Panjang City, it is concluded that

implementing BTS on BRT can be implemented in Padang Panjang City. However, it requires the political will of the regional head (Sudrajat & Andhika, 2021) took over the operation of public transport by the local government with Buy the Service. In addition, in implementing this policy, it is necessary to pay attention to several things, namely: ongoing outreach to the public regarding the ease and convenience of using BRT and equalization of perceptions between local governments and operators regarding the mechanism for providing BRT subsidies.

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