

Operational Performance Analysis of Rapid Transit Bus (BRT) Corridor 11 in Pulo Gebang Bus Station

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Abstract

The implementation of road-based mass transportation in the city of Jakarta, which is named Transjakarta, has quite significant developments. Corridor 11 has a fairly long route of 15 km and passes through 16 stops/shelters. However, Corridor 11 has not been evaluated regarding operational performance on this route. In accordance with the assessment analysis that Transjakarta corridor 11 still does not meet the basic BRT standards. And based on the technical guidelines for public transportation on fixed and regular routes in urban areas (Decree of the Director General of Land Transportation No. 687 of 2002) the parameters reviewed for analyzing the operational performance of Transjakarta corridor 11 consist of the load factor (load factor), the number of passengers transported, the time between bus arrival (headway), travel time, passenger comfort and the level of passenger satisfaction with Transjakarta services. The method uses the Minimum Service Standards (SPM) for Road-Based Mass Transportation and SPM for the transportation of people with motorized vehicles on the routes regulated in PMPRI Number 10 of 2012 and Number 98 of 2013. While the level of passenger satisfaction uses the IPA method or measurement of service quality which compares satisfaction between passengers and passenger expectations. Based on the results of the analysis, the average travel time on Thursday at 06.00-07.30 is 0 hours 55 minutes, for Thursday at 15.30-17.00 is 1 hour 5 minutes. While on Sundays at 06.00-07.30 is 0 hours 58 minutes, for Sundays at 15.30-17.00 is 1 hour 0 minutes. The time between buses (headway) on Thursdays at 06.00-07.30 is 4 minutes, for Thursdays at 15.30-17.00 is 4 minutes. While on Sundays at 06.30-07.30 is 4 minutes, for Sundays at 15.30-17.00 is 4 minutes. The average load factor of the Transjakarta BRT corridor 11 per bus stop on each bus SAF 041, SAF 031, PPD 0204, PPD 0309 and PPD 0291 respectively is 5.15%, 4.375%, 4.67%, 4.22% and 4.53%. From the results of service quality measurements, it can be concluded that the operational performance of Transjakarta corridor 11 has not fully met the standards because of frequent delays in operating time and low passenger satisfaction with Transjakarta comfort.

Keywords:

Headway, Load Factor, Performance, Rapid Transit Bus (BRT), Service Quality, Transportation, Travelling Time.

1. Introduction

Some research on universal transportation in Indonesia also shows that the existing universal transportation conditions have not provided excellent service to users. Through the revision of the quality of transportation services by producing urban universal transportation that is comfortable, safe, orderly, cheap, affordable and scheduled, it will increase the use of universal transportation. Although in some literature it is explained that the use of BRT (Bus Rapid Transit) the majority of citizens are captive to public transportation with low income levels. BRT is an integrated system of bus facilities, services and comfort that can collectively increase speed and reliability and is integrated with robust transit through great service quality.

One of the current general policies for transportation development at the Pulo Gebang Terminal Corridor 11 location is the use of sustainable transportation through the development of integrated mass public transportation, where BRT mass public transportation including feeder transportation is the main key in answering transportation problems in every city in Indonesia. It is not surprising that BRT has been widely implemented in various areas including the City of Jakarta, especially in the Pulo Gebang Terminal Corridor 11. The quality of BRT services in the Jakarta area which is good in serving the movement of people including attracting people to switch to BRT is very important, especially BRT at the Pulo Gebang Terminal which has the potential to be profitable for the community. local communities.

One of the functions of this BRT (Bus Rapid Transit) is to serve the community around the area, including being used by workers and the surrounding community who are carrying out work activities. Regarding BRT corridor 11 which is still poor in terms of headway, load factor and time performance. However, related to the new normal, many BRT performances have become normal, such as the headway which should have been 20 minutes to 5-10 minutes related to the new normal.

1.1. Problem Introduction

Based on the things above, the problem that arises is that there are still many services that do not meet the standards of Transjakarta related to timely performance, availability of information and the feasibility of shelters in several locations.

1.2. Problem Formulation

In this final project, the formulation of the problem that will be discussed regarding the operational performance of the Transjakarta Bus Corridor 11 which serves the Pulogebang Terminal - Kampung Melayu route is as follows :

1. How is the performance analysis of the BRT feeder bus from Pulogebang Terminal - Kampung Melayu?
2. How is the level of passenger satisfaction with shelters and Transjakarta buses?
3. What is the solution for handling BRT performance from the Pulogebang Terminal – Kampung Melayu?.

1.3. Problem Formulation

The objectives to be achieved in writing this Final Project, namely:

1. To analyze and evaluate the performance of the feeder bus from Pulogebang Terminal – Kampung Melayu.
2. Recognize the level of passenger satisfaction with the terminal and Transjakarta Bus.
3. To find solutions for handling BRT performance from the Pulogebang Terminal – Kampung Melayu.

2. Methodology

Literature studies were obtained from various sources such as textbooks, journals, related regulations and previous research reports related to this final project, including :

1. Travel Time

Travel time is the time required to take a route that is influenced by various factors such as stop time and delay time.

2. Difference in arrival time between fleets

The difference in arrival time between fleets is the time distance between one bus and the next bus according to a set schedule.

3. Comfort sitting and standing

The comfort of sitting and standing is the level of comfort that can only be obtained from corridor 11 BRT passengers.

4. Public service

Public services are all forms of public sector services carried out by agencies, so that the level of service quality is expected by customers.

5. Method of collecting data

In the preparation of this final project requires real data in accordance with primary data and secondary data, it takes several techniques for data collection.

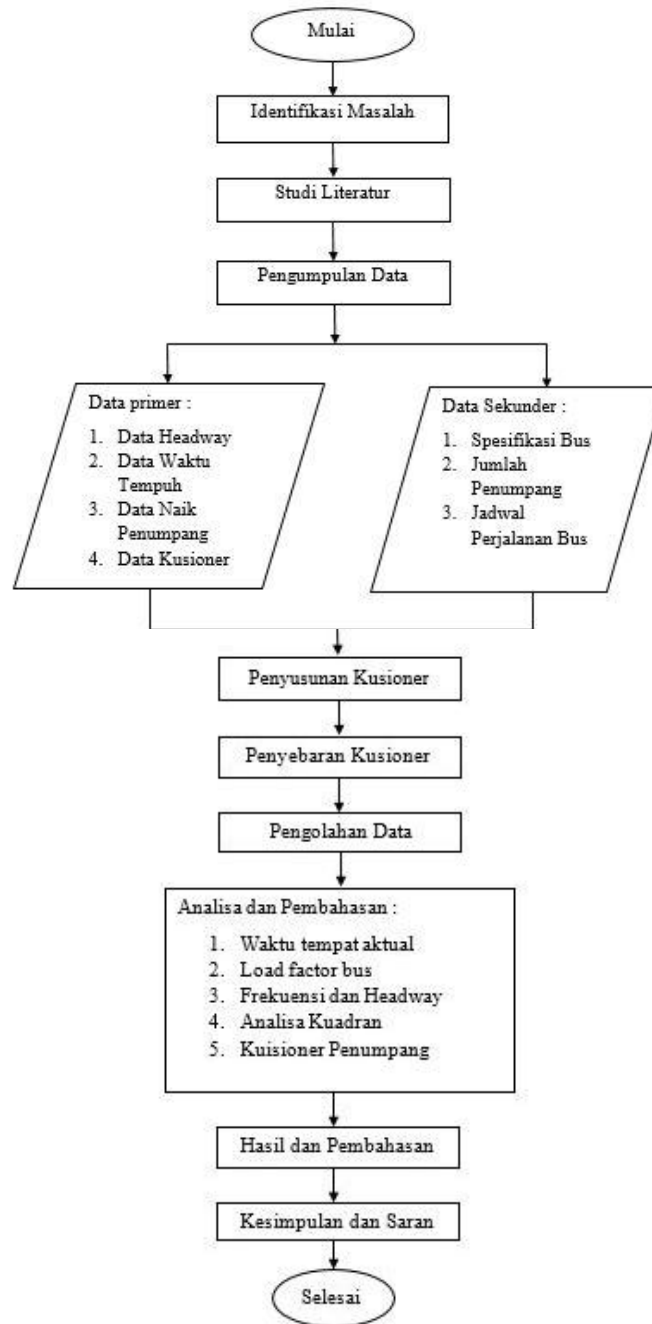


Figure 1. Research Method Flowchart
Source: Author, 2021

3. Results and Discussion

3.1 Site Plan

The study location is in DKI Jakarta, precisely in East Jakarta with the Corridor 11 service network route. The network of stops that the Transjakarta Bus passes as follows: Pulo Gebang Terminal – Milling – Prumnas Klender – Raden Inten Flyover – Buaran – Kampung Sumur – Klender Station – Cipinang – Immigration East Jakarta – Enjo Market – Jatinegara Flyover – Jatinegara Station 2 – Jatinegara Primary Hospital – Kampung Melayu.



Figure 2. Transjakarta Service Route

Source : Transjakarta.com, 2020

3.2 Primary Data

Primary data is data taken directly based on observations. This data is obtained by direct observation of the object by direct observation of the object under study. Forms that must be prepared to obtain primary data are forms for filling out travel times, arrival times between fleets, bus dimensions and survey supporting equipment. Primary data collected in the form of :

1. Actual time of arrival data between fleets
2. Passenger boarding data, headway and questionnaire

3.3 Secondary Data

In this final project, the secondary data used is data from PT. Jakarta Transportation :

1. Passenger Volume Data
Passenger volume data obtained from PT. Jakarta Transportation is based on the number of passengers transported each month, by passenger volume.
2. Bus specifications
Transjakarta bus dimension size data obtained from PT. Jakarta Transportation. The buses used in the operation of Transjakarta are medium-sized buses with a body length of 7,310 m and a bus body wid of forms for filling out travel times, arrival times between fleets, bus dimensions and survey supporting equipment. Primary data collected in the form of :
 - a. Actual time of arrival data between fleets
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3.5 Travel Time

The travel time of transport operating on Transjakarta is the travel time on 1 trip cycle consisting of running time, stopping time for each stop when picking up and dropping passengers, stopping time at traffic lights, and stopping time due to delays.

3.5.1 Travel time on weekdays

Calculation of travel time on weekdays is on Thursday, June 3, 2021.

Table 1. Transjakarta Travel Time Thursday Hours (06.00 – 07.30)

Waktu Tempuh

Weekdays

Hari/tanggal : Kamis, 3 Juni 2021
Jam Sibuk : Pagi (06.00-07.30)

No. Bus	SAF 041		SAF 031		PPD 0204		PPD 0204		PPD 0204	
Shelter/halte	Waktu Tempuh		Waktu Tempuh		Waktu Tempuh		Waktu Tempuh		Waktu Tempuh	
	Antar Halte	Naik/turun	Antar Halte	Naik/turun	Antar Halte	Naik/turun	Antar Halte	Naik/turun	Antar Halte	Naik/turun
	mnt	sec	mnt	sec	mnt	sec	mnt	sec	mnt	sec
Terminal Pulogebang	0	0	0	0	0	0	0	0	0	0
Walikota Jakarta Timur	11	10	15	10	12	10	10	12	9	15
Penggilingan	2	8	1	8	2	9	2	5	3	7
Perumnas Klender	3	8	3	8	3	9	3	5	3	7
Flyover Raden Inten	2	10	2	8	2	13	3	0	4	7
Buaran	2	9	1	9	3	0	2	3	1	0
Kampung Sumur	1	0	2	0	2	12	2	5	2	0
Flyover Klender	2	0	2	0	2	0	3	4	2	7
Stasiun Klender	2	0	3	12	2	8	1	0	2	3
Cipinang	2	8	2	0	3	0	1	0	1	8
Imigrasi Jakarta Timur	2	8	2	5	2	5	1	4	3	11
Pasar Enjo	2	0	2	0	2	11	4	5	3	12
Flyover Jatinegara	1	0	2	0	2	8	2	7	3	10
Stasiun Jatinegara 2	2	0	1	11	2	0	2	7	4	0
Jatinegara RS Premiere	2	10	3	8	2	8	2	9	2	0
Kampung Melayu	6	20	6	20	6	30	5	20	5	22
Total	42	91	47	99	47	123	43	86	47	109
Jam	0,7	0,025	0,78	0,0275	0,78	0,034	0,71	0,023	0,78	0,03
	0,725		0,8075		0,814		0,733		0,81	

Source: Data Processed Writing, 2021

Table 2. Transjakarta Travel Time Thursday Hours (15.30 – 17.00)

Waktu Tempuh

Weekdays

Hari/tanggal : Kamis, 3 Juni 2021
Jam Sibuk : Sore (15.30-17.00)

No. Bus	SAF 041		SAF 031		PPD 0204		PPD 0204		PPD 0204	
Shelter/halte	Waktu Tempuh		Waktu Tempuh		Waktu Tempuh		Waktu Tempuh		Waktu Tempuh	
	Antar Halte	Naik/turun	Antar Halte	Naik/turun	Antar Halte	Naik/turun	Antar Halte	Naik/turun	Antar Halte	Naik/turun
	mnt	sec	mnt	sec	mnt	sec	mnt	sec	mnt	sec
Terminal Pulogebang	0	0	0	0	0	0	0	0	0	0
Walikota Jakarta Timur	10	5	12	7	12	10	8	5	10	7
Penggilingan	3	5	3	0	3	8	3	5	5	5
Perumnas Klender	3	8	3	0	3	12	3	8	5	0
Flyover Raden Inten	2	10	6	8	6	12	2	5	5	4
Buaran	3	8	3	0	3	7	5	0	3	5
Kampung Sumur	3	0	2	10	3	8	1	0	2	5
Flyover Klender	4	10	2	11	4	8	1	11	2	8
Stasiun Klender	2	9	3	9	4	10	2	9	1	11
Cipinang	3	9	3	9	2	9	3	9	3	12
Imigrasi Jakarta Timur	5	8	2	7	4	0	3	8	4	8
Pasar Enjo	4	7	3	8	3	10	3	6	4	9
Flyover Jatinegara	3	8	4	8	4	0	4	6	2	0
Stasiun Jatinegara 2	3	0	3	8	4	11	5	7	4	0
Jatinegara RS Premiere	2	0	5	8	2	11	4	8	4	8
Kampung Melayu	6	20	10	20	10	15	6	22	4	23
Total	56	107	64	113	67	131	53	109	58	105
Jam	0,93	0,031	1,06	0,031	1,15	0,036	0,88	0,03	0,96	0,03
	0,961		1,091		1,186		0,91		0,99	

Source: Data Processed Writing, 2021

3.5.2 Travel time on weekend

Calculation of travel time on weekend is on Sunday, June 6, 2021.

Table 4. Transjakarta Travel Time Sunday Hours (06.00 – 07.30)

Waktu Tempuh

Weekend

Hari/tanggal : Minggu, 6 Juni 2021
Jam Sibuk : Pagi (06.00-07.30)

No. Bus	SAF 041		SAF 031		PPD 0204		PPD 0204		PPD 0204	
Shelter/halte	Waktu Tempuh		Waktu Tempuh		Waktu Tempuh		Waktu Tempuh		Waktu Tempuh	
	Antar Halte	Naik/turun	Antar Halte	Naik/turun	Antar Halte	Naik/turun	Antar Halte	Naik/turun	Antar Halte	Naik/turun
	mmt	sec	mmt	sec	mmt	sec	mmt	sec	mmt	sec
Terminal Pulogebang	0	0	0	0	0	0	0	0	0	0
Walikota Jakarta Timur	10	10	8	15	8	8	9	11	9	12
Penggilingan	2	8	2	8	2	8	3	7	3	0
Perumnas Klender	2	0	2	0	2	8	3	8	2	0
Flyover Raden Inten	1	0	2	10	2	0	2	0	2	5
Buaran	1	8	1	0	3	10	2	0	2	4
Kampung Sumur	2	0	1	0	3	9	2	6	2	8
Flyover Klender	3	0	3	0	3	0	3	7	2	8
Stasiun Klender	2	10	2	10	3	0	4	8	2	6
Cipinang	2	12	2	11	2	8	3	14	4	0
Imigrasi Jakarta Timur	3	14	2	0	2	8	4	9	3	0
Pasar Enjo	2	0	3	0	3	8	0	8	5	0
Flyover Jatinegara	2	9	3	10	1	10	0	0	1	8
Stasiun Jatinegara 2	2	8	2	8	2	10	4	12	2	8
Jatinegara RS Premiere	2	8	2	0	3	9	4	0	2	8
Kampung Melayu	7	20	8	20	11	25	8	18	6	23
Total	43	107	43	92	50	121	51	108	47	90
Jam	0,716	0,029	0,833	0,033	0,833	0,033	0,85	0,03	0,783	0,025
	0,745		0,866		0,866		0,88		0,808	

Source: Data Processed Writing, 2021

Table 4. Transjakarta Travel Time Sunday Hours (15.30 – 17.00)

Waktu Tempuh

Weekend

Hari/tanggal : Minggu, 6 Juni 2021
Jam Sibuk : Sore (15.30-17.00)

No. Bus	SAF 041		SAF 031		PPD 0204		PPD 0204		PPD 0204	
Shelter/halte	Waktu Tempuh		Waktu Tempuh		Waktu Tempuh		Waktu Tempuh		Waktu Tempuh	
	Antar Halte	Naik/turun	Antar Halte	Naik/turun	Antar Halte	Naik/turun	Antar Halte	Naik/turun	Antar Halte	Naik/turun
	mmt	sec	mmt	sec	mmt	sec	mmt	sec	mmt	sec
Terminal Pulogebang	0	0	0	0	0	0	0	0	0	0
Walikota Jakarta Timur	10	11	10	0	10	8	9	11	10	10
Penggilingan	2	10	3	8	4	0	2	6	2	4
Perumnas Klender	2	10	2	8	2	8	2	6	3	0
Flyover Raden Inten	3	0	2	8	3	0	4	0	3	0
Buaran	2	0	3	11	2	8	3	0	3	5
Kampung Sumur	2	5	2	9	1	8	3	7	3	5
Flyover Klender	3	8	3	0	3	0	1	7	1	8
Stasiun Klender	3	8	3	0	3	10	2	10	1	12
Cipinang	2	8	2	11	2	0	2	9	1	8
Imigrasi Jakarta Timur	2	10	3	8	4	11	3	9	2	8
Pasar Enjo	2	12	3	9	3	8	2	6	3	12
Flyover Jatinegara	1	11	3	0	3	9	2	12	4	9
Stasiun Jatinegara 2	3	8	2	10	2	0	2	10	1	0
Jatinegara RS Premiere	2	7	2	11	3	11	4	7	4	0
Kampung Melayu	8	25	10	25	12	22	6	18	8	20
Total	47	133	53	118	57	103	47	118	49	101
Jam	0,783	0,036	0,883	0,0325	0,95	0,028	0,783	0,032	0,816	0,283
	0,819		0,9155		0,978		0,815		1,099	

Source: Data Processed Writing, 2021

3.6 Headway

Based on the given schedule, Transjakarta's scheduled headway is 5-10 minutes. With the data obtained from the survey results, the actual headway of Transjakarta buses operating on corridor 11 is obtained with the calculations presented in the table below.

3.6.1 Headway time on weekdays

Calculation of headway on weekdays is on Thursday, June 3, 2021.

Table 5. Transjakarta Headway Thursday Hours (06.00 – 07.30)

Headway
Weekdays

Hari/tanggal : Kamis, 3 Juni 2021
Jam Sibuk : Pagi (06.00-07.30)

Shelter/halte	Bus 1	Headway (1-2)	Bus 2	Headway (2-3)	Bus 3	Headway (3-4)	Bus 4	Headway (4-5)	Bus 5
	SAF 041	mmt	SAF 031	mmt	PPD 0204	mmt	PPD 0309	mmt	PPD 0291
Terminal Pulogebang	06.20	00.03	06.23	00.05	06.28	00.04	06.32	00.03	06.35
Walikota Jakarta Timur	06.23	00.04	06.27	00.04	06.31	00.03	06.34	00.03	06.37
Penggilingan	06.26	00.04	06.30	00.03	06.33	00.03	06.36	00.04	06.40
Perummas Klender	06.28	00.06	06.34	00.01	06.35	00.04	06.39	00.03	06.42
Flyover Raden Inten	06.30	00.07	06.37	00.01	06.38	00.03	06.41	00.03	06.44
Buaran	06.33	00.06	06.39	00.03	06.42	00.01	06.43	00.04	06.47
Kampung Sumur	06.35	00.06	06.41	00.04	06.45	00.01	06.46	00.04	06.50
Flyover Klender	06.38	00.05	06.43	00.05	06.48	00.01	06.49	00.03	06.52
Stasiun Klender	06.40	00.06	06.46	00.04	06.50	00.02	06.52	00.02	06.54
Cipinang	06.42	00.06	06.48	00.04	06.52	00.02	06.54	00.03	06.57
Imigrasi Jakarta Timur	06.45	00.05	06.50	00.04	06.54	00.03	06.57	00.03	07.00
Pasar Enjo	06.48	00.05	06.53	00.03	06.56	00.04	07.00	00.05	07.05
Flyover Jatinegara	06.51	00.04	06.55	00.03	06.58	00.04	07.04	00.04	07.08
Stasiun Jatinegara 2	06.54	00.03	06.57	00.03	07.00	00.08	07.08	00.05	07.13
Jatinegara RS Premiere	06.56	00.03	06.59	00.03	07.02	00.10	07.12	00.03	07.15
Kampung Melayu	06.59	00.02	07.01	00.03	07.04	00.10	07.14	00.06	07.20
Rata-rata		00.05		00.03		00.04		00.03	

Source: Data Processed Writing, 2021

Table 6. Transjakarta Headway Thursday Hours (15.30 – 17.00)

Headway
Weekdays

Hari/tanggal : Kamis, 3 Juni 2021
Jam Sibuk : Sore (15.30-17.00)

Shelter/halte	Bus 1	Headway (1-2)	Bus 2	Headway (2-3)	Bus 3	Headway (3-4)	Bus 4	Headway (4-5)	Bus 5
	SAF 041	mmt	SAF 031	mmt	PPD 0204	mmt	PPD 0309	mmt	PPD 0291
Terminal Pulogebang	15.40	00.05	15.45	00.03	15.48	00.02	15.50	00.04	15.54
Walikota Jakarta Timur	15.42	00.05	15.47	00.03	15.50	00.03	15.53	00.04	15.57
Penggilingan	15.45	00.04	15.49	00.03	15.52	00.04	15.56	00.04	16.00
Perummas Klender	15.47	00.03	15.50	00.05	15.55	00.03	15.58	00.04	16.02
Flyover Raden Inten	15.50	00.02	15.52	00.06	15.58	00.02	16.00	00.05	16.05
Buaran	15.52	00.02	15.54	00.06	16.00	00.03	16.03	00.05	16.08
Kampung Sumur	15.54	00.02	15.56	00.06	16.02	00.04	16.06	00.04	16.10
Flyover Klender	15.57	00.02	15.59	00.05	16.04	00.06	16.10	00.02	16.12
Stasiun Klender	15.59	00.03	16.02	00.05	16.07	00.06	16.13	00.02	16.15
Cipinang	16.01	00.05	16.06	00.04	16.10	00.06	16.16	00.03	16.19
Imigrasi Jakarta Timur	16.04	00.05	16.09	00.03	16.12	00.07	16.19	00.03	16.22
Pasar Enjo	16.07	00.05	16.12	00.03	16.15	00.07	16.21	00.05	16.26
Flyover Jatinegara	16.09	00.05	16.14	00.04	16.18	00.06	16.24	00.05	16.29
Stasiun Jatinegara 2	16.13	00.04	16.17	00.04	16.21	00.05	16.26	00.07	16.33
Jatinegara RS Premiere	16.16	00.03	16.19	00.05	16.24	00.05	16.29	00.07	16.36
Kampung Melayu	16.19	00.03	16.22	00.04	16.26	00.07	16.33	00.07	16.40
Rata-rata		00.04		00.04		00.05		00.04	

Source: Data Processed Writing, 2021

3.6.2 Headway time on weekend

Calculation of headway on weekend is on Sunday, June 6, 2021.

Table 7. Transjakarta Travel Time Thursday Hours (06.00 – 07.30)

Headway
Weekend

Hari/tanggal : Minggu, 6 Juni 2021
Jam Sibuk : Pagi (06.00-07.30)

Shelter/halte	Bus 1	Headway (1-2)	Bus 2	Headway (2-3)	Bus 3	Headway (3-4)	Bus 4	Headway (4-5)	Bus 5
	SAF 041	mmt	SAF 031	mmt	PPD 0204	mmt	PPD 0309	mmt	PPD 0291
Terminal Pulogebang	06.10	00.03	06.13	00.02	06.15	00.03	06.18	00.02	06.20
Walikota Jakarta Timur	06.12	00.04	06.16	00.02	06.18	00.03	06.21	00.02	06.23
Penggilingan	06.15	00.04	06.19	00.02	06.21	00.03	06.24	00.03	06.27
Perumnas Klender	06.18	00.04	06.22	00.02	06.24	00.03	06.27	00.04	06.31
Flyover Raden Inten	06.20	00.05	06.25	00.02	06.27	00.03	06.30	00.04	06.34
Buaran	06.23	00.04	06.27	00.03	06.30	00.04	06.34	00.04	06.38
Kampung Sumur	06.25	00.04	06.29	00.04	06.33	00.04	06.37	00.06	06.43
Flyover Klender	06.29	00.03	06.32	00.03	06.35	00.06	06.41	00.05	06.46
Stasiun Klender	06.32	00.03	06.35	00.03	06.38	00.06	06.44	00.05	06.49
Cipinang	06.35	00.03	06.38	00.02	06.40	00.07	06.47	00.04	06.51
Imigrasi Jakarta Timur	06.38	00.02	06.40	00.03	06.43	00.07	06.50	00.03	06.53
Pasar Enjo	06.42	00.02	06.44	00.03	06.47	00.06	06.53	00.05	06.58
Flyover Jatinegara	06.45	00.04	06.49	00.03	06.52	00.04	06.56	00.07	07.03
Stasiun Jatinegara 2	06.50	00.04	06.54	00.03	06.57	00.07	07.00	00.08	07.08
Jatinegara RS Premiere	06.52	00.04	06.56	00.04	07.00	00.03	07.03	00.07	07.10
Kampung Melayu	06.55	00.03	06.58	00.07	07.05	00.03	07.08	00.04	07.12
Rata-rata		00.04		00.03		00.05		00.04	

Source: Data Processed Writing, 2021

Table 8. Transjakarta Travel Time Thursday Hours (15.30 – 17.00)

Headway
Weekend

Hari/tanggal : Minggu, 6 Juni 2021
Jam Sibuk : Sore (15.30-17.00)

Shelter/halte	Bus 1	Headway (1-2)	Bus 2	Headway (2-3)	Bus 3	Headway (3-4)	Bus 4	Headway (4-5)	Bus 5
	SAF 041	mmt	SAF 031	mmt	PPD 0204	mmt	PPD 0309	mmt	PPD 0291
Terminal Pulogebang	15.43	00.03	15.46	00.03	15.49	00.03	15.52	00.03	15.55
Walikota Jakarta Timur	15.46	00.02	15.48	00.04	15.52	00.04	15.56	00.02	15.58
Penggilingan	15.49	00.02	15.51	00.05	15.56	00.02	15.58	00.03	16.01
Perumnas Klender	15.51	00.04	15.55	00.06	16.01	00.02	16.03	00.02	16.05
Flyover Raden Inten	15.55	00.02	15.57	00.06	16.03	00.02	16.05	00.03	16.08
Buaran	15.58	00.01	15.59	00.06	16.05	00.03	16.08	00.05	16.13
Kampung Sumur	16.00	00.02	16.02	00.05	16.07	00.05	16.12	00.03	16.15
Flyover Klender	16.02	00.02	16.04	00.06	16.10	00.05	16.15	00.03	16.18
Stasiun Klender	16.05	00.04	16.09	00.04	16.13	00.04	16.17	00.04	16.21
Cipinang	16.08	00.04	16.12	00.03	16.15	00.05	16.20	00.04	16.24
Imigrasi Jakarta Timur	16.10	00.05	16.15	00.05	16.20	00.03	16.23	00.04	16.27
Pasar Enjo	16.13	00.05	16.18	00.05	16.23	00.04	16.27	00.07	16.30
Flyover Jatinegara	16.15	00.06	16.21	00.05	16.26	00.05	16.31	00.02	16.33
Stasiun Jatinegara 2	16.18	00.07	16.25	00.05	16.30	00.03	16.33	00.04	16.37
Jatinegara RS Premiere	16.22	00.06	16.28	00.05	16.33	00.02	16.35	00.05	16.40
Kampung Melayu	16.26	00.05	16.31	00.05	16.36	00.04	16.40	00.03	16.43
Rata-rata		00.04		00.05		00.03		00.04	

Source: Data Processed Writing, 2021

3.7 Research Instrument Test

Instrument testing is carried out to find out whether the questions that will be used as measuring tools are appropriate and relevant, so that the results obtained from the research can be justified. By conducting legitimacy and reliability research, it will be known the level of accuracy and accuracy as well as the level of consistency of the measuring instrument used.

1. Validity Test

The validity test in this study was used to validate the questionnaires that had been collected. A questionnaire is declared to pass validity if the significance value obtained is greater than the sig value (> 0.05). When the sig value is greater than 0.05, a questionnaire is declared to have passed the validity and is suitable for use for further testing.

Table 9. Validity Test Results of Each Variable

	Questionnaire Item	Signification Value $>0,05$	Count Signification (spss)	Conclusion
Variabel	TN 1	0,05	0,95	Valid
	TN 2		0,95	Valid
	TN 3		0,95	Valid
	TN 4		0,95	Valid
	TN 5		0,95	Valid
	TN 6		0,95	Valid
	TN 7		0,95	Valid
	TN 8		0,95	Valid
Reability	RA 1	0,05	0,95	Valid
	RA 2		0,95	Valid
	RA 3		0,95	Valid
	RA 4		0,95	Valid
Responsiveness	RS 1	0,05	0,95	Valid
	RS 2		0,95	Valid
	RS 3		0,95	Valid
Emphthy	EM 1	0,05	0,95	Valid
	EM 2		0,95	Valid
Assurance	AS 1	0,05	0,95	Valid
	AS 2		0,95	Valid

Source: Processed Writing Data (SPSS), 2021

2. Reliability Test

The next test after the validity test is the reliability test. This test is carried out with the aim of measuring the questionnaire that has been validated and reliable. This test is done by comparing the value of Croncbrach's Alpha > 0.60 . When the value of Croncbrach's Alpha > 0.60 then a questionnaire is declared dependable.

Table 10. Reliability Test Results

Croncbrach's Alpha $>0,60$	N
1	19

4. Conclusion

Based on the data obtained, both primary and secondary data on the performance of the Bus Federer BRT (Bus Rapid Transit) Corridor 11 at the Pulogebang Terminal – Kampung Melayu as well as direct observations of BRT facilities and infrastructure at every bus stop that passes through it. After the analysis can be concluded as follows :

1. From the results of the analysis of corridor 11, the travel time that has been determined according to the SPM has met the set standards. With a travel time of 55 minutes at working hours 06.00 – 07.30 and 1 hour 5 minutes at 15.30 – 17.00. And 58 minutes during holidays at 06.00 – 07.30 and 1 hour 0 minutes at 15.30 – 17.00. For the Headway in corridor 11, it meets the SPM, which is a maximum of 10 minutes. And for the frequency in 1 hour there are 5 buses that pass through corridor 11.
2. From these results it can be concluded that Transjakarta is included in the BRT-based mass transportation. The operational performance of Transjakarta corridor 11 has met the standards that have been regulated in accordance with applicable regulations, as evidenced by the main priority, nothing should be prioritized in terms of renewal. But for the low priority criteria, there are several things that must be considered regarding comfort and repairs, especially the bus stops that need attention.

3. Regarding the handling, at the point of infrastructure related to low priority which must be improved in various ways. Especially related to infrastructure such as bus stops and some important information on the bus.

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Biography / Biographies

Widodo Budi Dermawan born on July 2, 1970. Completed his undergraduate degree at Parahyangan Catholic University Bandung in 1994 with the title of his final assignment on Refueling System at Soekarno Hatta International Airport. He completed his master's degree at the University of Wisconsin at Madison, USA in 1996 with the title of his thesis "A Path-based Multi-class Dynamic Traffic Assignment Model". Lecturer in Transportation Engineering, Road Geometric Design, and Transportation Infrastructure courses at the Faculty of Civil Engineering, Mercu Buana University, Jakarta. Fields of research carried out include road safety engineering, development of accident prediction models and Intelligent Transportation System (ITS).

Alfian Andriyani Born on April 7, 1998. Completed Bachelor of Civil Engineering at Mercu Buana University and will graduate in 2021. He graduated from SMA Negeri 4 Jakarta, majoring in Stone and Concrete Construction Engineering .

Muhammad Isradi Born in Kandangan on August 18, 1972. He is the secretary of the Civil Engineering study program at Mercu Buana University. He earned a Bachelor's degree in Civil Engineering from the University of Muhammadiyah Malang in 1998 with his thesis title One Way Flat Plate Planning at Ratu Plaza Madiun. Then obtained a Master's degree in Civil Engineering with a Concentration in Transportation from Brawijaya University in 2001 with the title of a thesis, namely Analysis of the Family Movement Awakening Model in the Sawojajar Housing Area, Malang. He also teaches several courses such as Pavement Planning, Geometric Road Planning, Transportation Planning and Environmental Engineering.

Andri Irfan Rifai Senior Lecturer in Civil Engineering and Planning. He completed his PhD at the University of Indonesia & Universidade do Minho with a Sandwich Program scholarship from the Directorate General of Higher Education and an LPDP scholarship. He has been teaching for more than 19 years and is actively applying his knowledge in project development in Indonesia. His research interests range from road pavement management systems to advanced data mining techniques to transportation engineering. He has published more than 50 papers in journals and 2 books.