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PERFORMANCE ANALYSIS OF STREET AHMAD YANI KM 27 DUE TO THE SP. ROAD REHABILITATION WORK PROJECT. LIANG ANGGANG - BTS. TRAINING CITY SECTION 1 BANJARBARU CITY

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ABSTRACT

In this study, an analysis of the calculation of traffic volume, vehicle speed and side friction that occurred as a result of the Sp. Road Rehabilitation Project was carried out. Liang Anggang - Bts. Pelaihari City Section 1 Banjarbaru City using the 1997 Indonesian Road Capacity Manual (MKJI) method. Traffic volume conditions on Jalan Ahmad Yani Km 27 as a result of the Sp. Road Rehabilitation Project. Liang Anggang - Bts. Pelaihari City Section 1 City of Banjarbaru on Sunday, January 23, 2022 in the direction of Banjarbaru to Liang Anggang for 3007 vehicles/day, while the direction from Liang Anggang to Banjarbaru is 3041 vehicles/day.

The traffic capacity for Jalan Ahmad Yani Km 27 which has a population of 258,753 people, with a city size of 0.1 - 0.5. Analysis data for Jalan Ahmad Yani Km 27 as a result of the Sp. Road Rehabilitation Project. Liang Anggang - Bts. Pelaihari City Section 1, Banjarbaru City on Sunday, January 23, 2022 in the direction of Banjarbaru towards Liang Anggang 3007. With MC 73.46%, LV 15.76%, HV 10.31%, and UM 0.47%. while the direction of Liang Anggang is towards Banjarbaru 3041. With MC 73.04 %, LV 15.36%, HV 11.15%, and UM 0.46%.

The average speed that occurs on Jalan Ahmad Yani Km 27 due to the Road Rehabilitation Project Sp. Liang Anggang - Bts. Pelaihari City Section 1, Banjarbaru City on Sunday, January 23, 2022, headed from Banjarbaru to Liang Anggang with an average speed of MC 25.45 km/hour, LV 24.12 km/hour, HV 23.47 km/hour. while the direction of Liang Anggang is towards Banjarbaru with an average speed of MC 25.38 km/hour, LV 24.16 km/hour, HV 23.47 km/hour.

The traffic density that occurred on Jalan Ahmad Yani Km 27 as a result of the Sp. Road Rehabilitation Project. Liang Anggang - Bts. Pelaihari City Section 1, Banjarbaru City on Sunday, January 23, 2022 in the direction of Banjarbaru towards Liang Anggang with a traffic density of 86.81 vehicles/hour, LV 19.65 vehicles/hour, HV 13.21 vehicles/hour. while the Liang Anggang direction is towards Banjarbaru with a traffic density of MC 87.52 vehicles/hour, LV 19.33 vehicles/hour, HV 14.44 vehicles/hour.

Keywords: Capacity, Speed and Density and MKJI 1997

1. INTRODUCTION

Road Liang Anggang is one of the provincial roads that provides access to connect the Tanah Laut and Banjarmasin areas. This access road will receive rehabilitation improvements in 2021 to improve road performance. The problems that occur as a result

of the rehabilitation work are in the form of congestion which results in disruption of traffic flow which can affect the speed of vehicles when passing through these roads. With reduced vehicle speed it will result in increased traffic density on the road. This also has an effect on reduced traffic volume due to road users choosing other alternatives. So that this creates inconvenience for users of transportation facilities that will use the road.

In this study, an analysis of the calculation of traffic volume, vehicle speed and side friction that occurred as a result of the Sp. Road Rehabilitation Project was carried out. Liang Anggang - Bts. Pelaihari City Section 1 of Banjarbaru City using the 1997 Indonesian Road Capacity Manual (MKJI) method. This research was conducted on Jalan Ahmad Yani Km 27 on the Sp. Road Rehabilitation Project. Liang Anggang - Bts. Pelaihari City Section 1 Banjarbaru City.

2. LITERATURE REVIEW

Road Geometric Conditions

Road geometric is a highway structure that describes the shape or size of the highway which involves cross sections, lengthwise, and other aspects related to the physical form of the road (Kurniadhi, 2013).

Road Type

According to MKJI (1997), various types of roads will show different performance at certain traffic loads, for example divided roads, undivided roads, and one way roads.

Column Width

According to MKJI (1997), the width of the traffic lane is the width of the road for traffic purposes in the form of pavement and can be divided into several lanes.

3. RESEARCH METHODS

The following is a framework for the stages to be carried out in compiling this final project which can be seen in the flowchart in Figure 1.

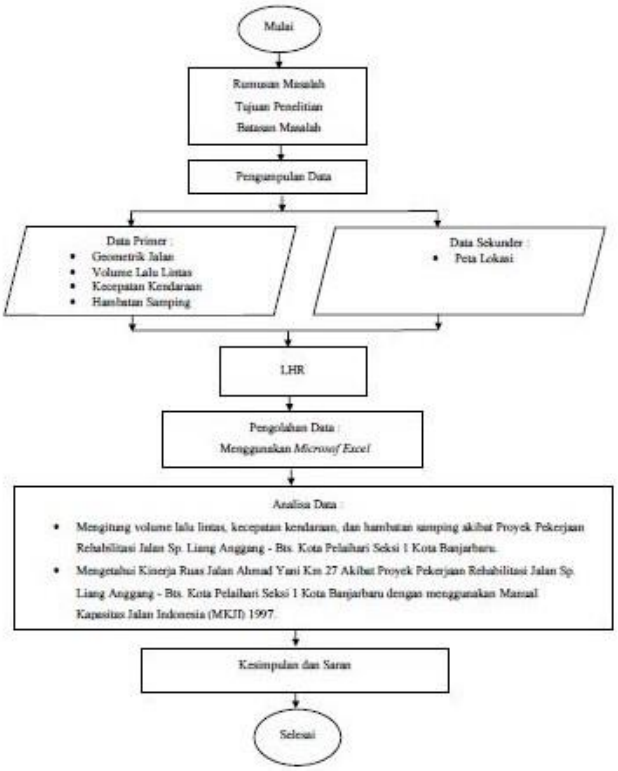

Figure 1. *Flowchart*

4. RESULTS AND DISCUSSION

Traffic Volumes

From the results of research data on traffic volume in the direction of Banjarbaru - Liang Anggang, it can be seen that the total traffic volume, the average traffic flow volume and the maximum value of traffic flow volume. Data can be seen in table 1 and table 2.

Table 1 Traffic Volume Data for Jalan Ahmad Yani Km 27 (Banjarbaru - Liang Anggang)

Waktu	Arus Total (Q) (Smp/Hari)	Rata-rata Volume Arus Lalu Lintas	Nilai Maksimum Volume Arus Lalu Lintas
Minggu, 23 Januari 2022	1401,05	58,38	95,30

(Sumber : Hasil Analisis Data)

Table 2 Traffic Volume Data for Jalan Ahmad Yani Km 27 (Liang Anggang - Banjarbaru)

Waktu	Arus Total (Q) (Smp/Hari)	Rata-rata Volume Arus Lalu Lintas	Nilai Maksimum Volume Arus Lalu Lintas
Minggu, 23 Januari 2022	1431,85	59,66	102,90

(Sumber : Hasil Analisis Data)

Traffic Composition

From the data in table 1 and table 2, the traffic composition on Jalan Ahmad Yani Km 27 as a result of the Road Rehabilitation Project Sp. Liang Anggang - Bts. Pelaihari City Section 1 Banjarbaru City obtained the following analysis, Traffic Composition on Jalan Ahmad Yani Km 27 Due to the Road Rehabilitation Project Sp. Liang Anggang - Bts. Pelaihari City Section 1 Banjarbaru City can be seen in table 3 and table 4.

Table 3 Traffic Composition of Jalan Ahmad Yani Km 27 (Banjarbaru - Liang Anggang)

WAKTU	Komposisi lalu lintas								Arus lalu lintas
	MC	%	LV	%	HV	%	UM	%	
Minggu, 23 Januari 2022	2209	73,46	474	15,76	310	10,31	14	0,47	3007

(Sumber : Hasil Analisis Data)

Table 4 Traffic Composition of Jalan Ahmad Yani Km 27 (Liang Anggang - Banjarbaru)

Waktu	Komposisi lalu lintas								Arus lalu lintas
	MC	%	LV	%	HV	%	UM	%	
Minggu, 23 Januari 2022	2221	73,04	467	15,36	339	11,15	14	0,46	3041

(Sumber : Hasil Analisis Data)

Traffic Speed

After getting the traffic speed data then determining the average speed of each vehicle, the average traffic speed data for each vehicle can be seen in table 5 and table 6.

Table 5 Average Traffic Speed Data Jalan Ahmad Yani Km 27 (Banjarbaru - Liang Anggang).

Waktu	Kecepatan Rata - rata Kendaraan (km/jam)		
	MC	LV	HV
Minggu, 23 Januari 2022	25,45	24,12	23,47

(Sumber : Hasil Analisis Data)

Table 6 Average Traffic Speed Data for Jalan Ahmad Yani Km 27 (Liang Anggang - Banjarbaru)

Waktu	Kecepatan Rata - Rata Kendaraan (km/jam)		
	MC	LV	HV
Minggu, 23 Januari 2022	25,38	24,16	23,47

(Sumber : Hasil Analisis Data)

Traffic Density

1. Traffic Density on Sunday, 23 January 2022 :

a. Banjarbaru – Liang Anggang

Jenis Kendaraan	q	s	K
MC	2209	25,45	86,81109
LV	474	24,12	19,65245
HV	310	23,47	13,23538

b. Liang Anggang – Banjarbaru

Jenis Kendaraan	q	s	K
MC	2221	25,38	86,09928
LV	467	24,16	18,98185
HV	339	23,47	14,37561

Side Barriers

After obtaining the side friction data from Banjarbaru to Liang Anggang then recapitulating the weight frequency, it can be seen in table 7 and table 8. Determination of the frequency of events can be seen in table 9 and Determination of the Side Resistance Class can be seen in table 10.

Table 7 Frequency of Weight of Side Barriers on Jalan Ahmad Yani Km 27 (Banjarbaru – Liang Anggang)

Waktu	Frekuensi Bobot Hambatan Samping				Total
	Pejalan Kaki (PED)	Parkir, Kendaraan Berhenti (PSV)	Kendaraan Masuk + Keluar (EEV)	Kendaraan Lambat (SMV)	Bobot
Minggu , 23 Januari 2022 (06.00 - 13.00)	11,5	25	22,4	13,2	72,1

(Sumber : Hasil Analisis Data)

Table 8 Frequency of Weight of Side Barriers on Jalan Ahmad Yani Km 27 (Liang Anggang - Banjarbaru)

Waktu	Frekuensi Bobot Hambatan Samping				Total
	Pejalan Kaki (PED)	Parkir, Kendaraan Berhenti (PSV)	Kendaraan Masuk + Keluar (EEV)	Kendaraan Lambat (SMV)	Bobot
Minggu, 23 Januari 2022 (06.00 - 13.00)	7	22	21	13,2	63,2

(Sumber : Hasil Analisis Data)

Table 9 Determination of the Frequency of Events on Sunday, January 23, 2022

Tipe Kejadian Hambatan Samping	Simbol	Faktor Bobot	Frekuensi Kejadian	Frekuensi Berbobot
Pejalan Kaki	PED	0,5	8	4
Parkir,Kendaraan Berhenti	PSV	1,0	9	9
Kendaraan Masuk + Keluar	EEV	0,7	12	8,4
Kendaraan Lambat	SMV	0,4	12	4,8
Total				26,2

(Sumber : Hasil Analisis Data)

Table 10 Determination of Side Resistance Class

Hari, Tanggal	Frekwensi Berbobot Kejadian	Kelas Hambatan Samping	
Minggu, 23 Januari 2022 (06.00 - 13.00)	26,2	Sangat Rendah	VL

(Sumber : Hasil Analisis Data)

Free Flow Speed

In accordance with the input data collected above, the free flow speed calculation is shown in table 11.

Table 11 Free Flow Speed Determination

Waktu	Kecepatan Arus Bebas Dasar (Fvo) Tabel 2.6 (km/jam)	Faktor Koreksi Untuk Lebar Jalur (FVW) Tabel 2.7	Fvo (2) + FVw (3) = (Km/Jam)	Faktor Koreksi		Kecepatan Arus Bebas Sesungguhnya (4)x(5)x(6) = (km/jam
				Hambatan samping FFV sf Tabel 2.8	Ukuran Kota FFVcs Tabel 2.9	
1	2	3	4	5	6	7
Minggu, 23 Januari 2022 (06.00 - 13.00)	42	0	42	1,01	0,90	38,178

(Sumber : Hasil Analisis Data)

Capacity

The capacity results from both directions Banjarbaru – Liang Anggang and Liang Anggang – Banjarbaru are the same. This is because the adjustment factor used in calculating the capacity is the same. Capacity values can be seen in table 12.

Table 12 Capacity Value (C)

Waktu	Kapasitas dasar Co Tabel 2.10 (smp/jam)	Faktor Penyesuaian untuk Kapasitas				Kapasitas C Smp/jam
		Lebar Lajur FCw Tabel 2.11	Pemisahan Arah FCsp	Hambatan Samping FCsf	Ukuran Kota FCcs Tabel 2.14	
1	2	3	4	5	6	7
Minggu, 23 Januari 2022 (06.00 - 13.00)	2900	1,00	1,00	1,01	0,90	2636,1

(Sumber : Hasil Analisis Data)

Degree of Saturation (DS)

1. Degrees of Saturation on Sunday, January 23, 2022:
   a. Direction Banjarbaru - Liang Anggang

      DS = Q/C

      DS = 95 / 2636,1

      DS = 0,036

   a. Direction Liang Anggang – Banjarbaru

      DS = Q/C

      DS = 103 / 2636,1

      DS = 0,039

Travel Time Speed

1. Speed and Travel Time from Banjarbaru to Liang Anggang

Tabel 13 Kecepatan dan Waktu Tempuh Masing-masing Tipe Kendaraan (Banjarbaru - Liang Anggang)

Jenis Kendaraan	Kecepatan dan Waktu Tempuh
MC	25,45
LV	24,12
HV	23,47

(Sumber : Hasil Analisis Data)

2. Speed and Travel Time Liang Anggang – Banjarbaru

Table 14 Speed and Travel Time of Each Vehicle Type (Liang Anggang - Banjarbaru)

Jenis Kendaraan	Kecepatan dan Waktu Tempuh
MC	25,38
LV	24,16
HV	23,47

(Sumber : Hasil Analisis Data)

Service Level

Level of Service on Jalan Ahmad Yani Km 27 Due to the Road Rehabilitation Project Sp. Liang Anggang - Bts. Pelaihari City Section 1 Banjarbaru City itself can be seen in table 15.

Table 15 Level of Service for Jalan Ahmad Yani Km 27

Segmen Jalan A. Yani Km 27	Derajat Kejenuhan	Tingkat Pelayanan
Minggu, 23 Januari 2022		
Banjarbaru - Liang Anggang	0,036	A
Liang Anggang - Banjarbaru	0,039	A

(Sumber : Hasil Analisis Data)

5. CONCLUSIONS AND SUGGESTIONS

Conclusion

Based on the results of the Performance Analysis of Jalan Ahmad Yani Km 27 Due to the Road Rehabilitation Project Sp. Liang Anggang - Bts. Pelaihari City Section 1 Banjarbaru City on Sunday, January 23 2022 which has been analyzed in the previous chapter, the following conclusions can be drawn, namely:

1. Traffic volume conditions on Jalan Ahmad Yani Km 27 due to the Sp. Road Rehabilitation Project. Liang Anggang - Bts. Pelaihari City Section 1 City of Banjarbaru on Sunday, January 23, 2022 in the direction of Banjarbaru to Liang Anggang for 3007 vehicles/day, while the direction from Liang Anggang to Banjarbaru is 3041 vehicles/day.
2. The traffic capacity for Jalan Ahmad Yani Km 27 which has a population of 258,753 people, with a city size of 0.1 - 0.5. Analysis data for Jalan Ahmad Yani Km 27 as a result of the Sp. Road Rehabilitation Project. Liang Anggang - Bts. Pelaihari City Section 1 City of Banjarbaru on Sunday, January 23, 2022 in the direction of Banjarbaru towards Liang Anggang 3007. With MC 73.46%, LV 15.76%, HV 10.31%, and UM 0.47%. while the direction of Liang Anggang is towards Banjarbaru 3041. With MC 73.04%, LV 15.36%, HV 11.15%, and UM 0.46%.
3. The average speed that occurs on Jalan Ahmad Yani Km 27 due to the Road Rehabilitation Project Sp. Liang Anggang - Bts. Pelaihari City Section 1, Banjarbaru City on Sunday, January 23, 2022, headed from Banjarbaru to Liang Anggang with an average speed of MC 25.45 km/hour, LV 24.12 km/hour, HV 23.47 km/hour. while the direction of Liang Anggang is towards Banjarbaru with an average speed of MC 25.38 km/hour, LV 24.16 km/hour, HV 23.47 km/hour.
4. The traffic density that occurred on Jalan Ahmad Yani Km 27 as a result of the Sp. Road Rehabilitation Project. Liang Anggang - Bts. Pelaihari City Section 1, Banjarbaru City on Sunday, January 23, 2022 in the direction of Banjarbaru

towards Liang Anggang with a traffic density of 86.81 vehicles/hour, LV 19.65 vehicles/hour, HV 13.21 vehicles/hour. while the Liang Anggang direction is towards Banjarbaru with a traffic density of MC 87.52 vehicles/hour, LV 19.33 vehicles/hour, HV 14.44 vehicles/hour.

Suggestion

The suggestions that can be given by research to conduct research like this are as follows:

1. Conduct a review of the performance of disrupted traffic by comparing the performance of normal traffic on these roads.
2. For further research with the same conditions, field data collection should be done for 3 days to get more and more accurate data.
3. Use a speed measuring device such as a speedgun to measure speed.

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