THE INFLUENCE OF THE VOLUME OF MOTORCYCLE ON THE TRAFFIC SPEEDS ON THE OTTO ISKANDARDINATA ROAD IN SAMARINDA CITY

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ABSTRACT

Samarinda City currently has a population of around 872,768 people (BPS East Borneo 2019) which is included in the most populous city in East Kalimantan. With the increase in population in Samarinda City will increase the movement and need for access to transportation facilities and infrastructure.

The number of vehicles in East Kalimantan, especially motorcycles, increased by 2,228,292 (BPS East Borneo 2015). With the high growth in the number of vehicles, this makes several lanes in the city of Samarinda very risky to experience a decrease in traffic speeds such as on the Otto Iskandardinata Road section.

Otto Iskandardinata Road is a road that belongs to the UD 2/2 Collector category with a length of 0.960 km and a width of 8.6 m, data was taken for 2 weeks, from 11 February 2019 - 24 February 2019 with a time of research of 8 hours. The observation points were carried out at 2 observation points. In this study, using a conventional calculation method, namely by calculating the volume of vehicles using MKJI 1997.

Based on the results of calculations it can be seen that when the volume of the vehicle is small ie in the morning the vehicle speed when passing is relatively high and when the traffic volume has increased during the afternoon the traffic speed decreases. The solution that can be done to overcome the problems in Jalan Otto Iskandardinata City in Samarinda is to change the type of road that was originally from 2 / 2UD to 4 / 2UD. It can be seen that the degree of saturation has improved, which was originally 0.65 (2 / 2UD) to 0.40 (4/2 UD). So the road with type 4/2 UD shows better ability to accommodate the traffic flow on the Otto Iskandardinata road in Samarinda City.

Keywords: volume of motorcycle vehicles, vehicle speed

PRELIMINARY

Background

Road is a land transportation infrastructure that has a very important role in the land transportation sector, which supports the continuous distribution of goods and services to encourage economic growth in a region. Development in urban areas is a reflection of economic growth supported by adequate road infrastructure, so that development can be carried out safely, efficiently and on time. Road conditions that are traversed by high and repetitive traffic volume can cause a decrease in traffic speed, making it uncomfortable and unsafe to pass.

Samarinda City is the Capital City of East Kalimantan Province which is currently the center of the city with a variety of activities that continue to increase. The development of a region is marked by increased economic growth in society, as well as what happened in Samarinda City. Samarinda City currently has a population of around 872,768 people (BPS Kaltim 2019), which is included in the most populous city in East Kalimantan, which is experiencing an increase in population every year. With the increase in population, the problems that occur in Samarinda City are even more numerous, because increasing population in Samarinda City will increase movement and the need for access to transportation facilities and infrastructure.

The number of vehicles in East Kalimantan, especially motorcycles, increased by 2,228,292 (BPS East Kalimantan 2015). With the high growth in the number of vehicles, this makes a number of lanes in the city of Samarinda very risky to experience a decrease in traffic speeds such as the Otto Iskandardinata Road section.

Otto Iskandardinata Road is a road that belongs to the UD 2/2 Collector category with a length of 0.960 km and a width of 8.6 m. There are many factors that cause a decrease in traffic speed, not only the side obstacles that affect the speed of the traffic but the number of vehicles that exceed the road section also affects the speed of traffic, especially motorcycle vehicles which are the vehicle with the highest number compared to other vehicles.

Research Problem Formulation

The research problem formulation is as follows:

1. *What is the current volume of motorcycle vehicles on the Jalan Otto Iskandardinata City in Samarinda?*
2. *What is the effect of the volume of motorcycle vehicles on the traffic speed on Jalan Otto Iskandardinata Samarinda?*
3. *What is the solution that can be done to overcome the problems that occur at the observation site?*

Limitation of Research Problems

As for the limitations of the research problem are as follows:

1. *The research location is on the Otto Iskandar Dinata Street in Samarinda City*
2. *Calculations using the 1997 Indonesian Road Capacity Manual (MKJI'97)*
3. *The performance of road traffic based on:*
   a. *Traffic flow*
   b. *Capacity*
   c. *Degree of Saturation*
   d. *Speed*
   e. *Traveling time*
4. *Data is taken for 2 weeks, from 11 February 2019 - 24 February 2019 from Monday to Sunday with 8 hours of research time, and for 2 weeks observation is always carried out. The observation points were carried out at 2 points, namely:*
   - Dama Sungai Market Intersection starting on 11 February 2019 -17 February 2019
   - Mount Manggah from 18 February 2019 - 24 February 2019
   And research time at each point of observation as follows:
   - at 07.00-10.00 wita
   - at 11.00-14.00 wita
   - at 16.00-18.00 wita

Purpose and Research Objectives

I mean

The purpose of this study was to analyze the effect of motorcycle volumes on traffic speed on the Otto Iskandardinata Samarinda road.

Aim

The purpose of this study was to determine the effect of motorcycle volumes on traffic velocity on the Otto Iskandardinata road in Samarinda City.

Benefits of Research

The research benefits are as follows:

1. *Can be a source of information or knowledge about transportation, especially about the influence of motorcycle volumes on traffic speed on the Otto Iskandardinata Samarinda city.*
2. *Can be taken into consideration in future policy making.*
3. *As a reference material for other research.*
4. *Can be used as material to increase understanding in the field of transportation, especially regarding the influence of motorcycle volumes on traffic speed on the Otto Iskandar Dinata road in Samarinda City.*

BASIC THEORY

Urban Roads

According to the Indonesian Road Capacity Manual (MKJI, Bina Marga, 1997) defines urban roads as roads that have permanent and continuous development along all or almost all roads, minimum on one side of the road, whether in the form of land development or not. These include roads near urban centers with a population of more than 100,000 people, as well as roads in urban areas with populations of less than 100,000 people with permanent and continuous road side developments.

The types of roads on urban roads are as follows:

1. Divided two-way two-lane road (2/2 UD)

2. Four-way lane

a. Undivided (without median) (4/2 UD)

b. Divided (by median) (4/2 D)

3. The six-lane two-lane road is divided (6/2 D)

4. One-way street (1/1) (Alamsyah, A.A, 2008)

Traffic Volume

Traffic volume is the number of vehicles that pass a certain point on a united road segment expressed in vehicles per hour or passenger car units per hour. (PM number 96 of 2015). Average Daily Traffic Volume (LHR) is the total volume that crosses a point or section of road facilities for both majors, for one year divided by the number of days in a year and the Daily Traffic Volume Plan (VLHR) is an estimate or volume estimate daily traffic for the future in certain sections of the road. (Ministry of Public Works 1997).

Side Barriers

Side barriers are impacts on traffic performance from side activities of road segments. This is indicated by the factor of the number of weighted events, namely the actual occurrence frequency multiplied by the weighted factor.

The weighting factors of the saddles according to the 1997 Indonesian Road Capacity Manual (MKJI) are as follows:

a. Pedestrians (weight = 0.5)

b. Stop vehicle (weight = 1.0)

c. *Vehicles coming in and out of the side of the road (weight = 0.7)*

Travel Time Speed

The speed at which a vehicle travels is defined as the average speed for light vehicles in hours for the observed road conditions (MKJI, 1997). The average travel time equation is:

$V = L / TT$ ………………………………………………………… …. (2. 3)

V: The average speed of space (km / h)

L: Road segment length (km)

TT: Average LV travel time along road segments (Hours)

RESEARCH METHODOLOGY

Research sites

The location used as a place of research is Jalan Otto Iskandardinata Samarinda City. Administratively, this road is located in Samarinda Ilir Sub-District, Sungai Dama Sub-District, Samarinda City.

Picture 1 Research Location

Data Analysis Techniques

Data analysis techniques are an important step in a study. In this study, using a conventional calculation method, namely by calculating the volume of the vehicle.

Traffic Volume Analysis

There are several factors used in analyzing vehicle volumes as follows:

a. Traffic Volume

Traffic volume data obtained from surveys conducted in the field in the form of traffic volume in units of vehicle / hour. To get the traffic volume in units of junior high school / hour, it is necessary to do a multiplication of each type of vehicle with the equivalent factor of each vehicle. The data is obtained at 15 minute intervals into 1 hour intervals in a row. To determine the peak hour traffic volume by selecting the largest value on internal time 1 hour.

b. Capacity

From the geometric data that can be found in the field, it can be obtained the capacity of the road segment by entering certain variables based on the geometric data in the formula according to the Indonesian Road Capacity Manual (MKJI 1997).

c. Degree of Saturation

The degree of saturation is used to determine whether a road segment has a capacity problem or not. Factors that influence the degree of saturation are traffic capacity and volume.

d. Speed

The speed used in this study is the average speed of the space so it takes the travel time obtained from the survey results. The travel time data is searched for an average of each desired time interval and entered into the formula.

ANALYSIS AND DISCUSSION

Population Data

Population data is used as a reference to determine the capacity adjustment factor for city size (FCcs). This data is based on BPS (Statistics Indonesia) of Samarinda City which can be seen in table 1.1.

Table 1.1 Projection Data on the City of Samarinda Population by Gender in 2010-2019

No	Tahun	Jenis Kelamin		Total
		Laki-Laki	Perempuan	
1	2010	379400	352761	732161
2	2011	387288	360814	748102
3	2012	395467	369441	764908
4	2013	404073	376942	781015
5	2014	411996	385010	797006
6	2015	420141	392456	812597
7	2016	428155	400148	828303
8	2017	435949	407497	843446
9	2018	443379	414701	858080
10	2019	451099	421669	872768

Source: Central Statistics Agency (BPS) of Samarinda City

Geometric Conditions and Road Environment

Geometric conditions and road environment include: road names, road functions and so on can be seen in table 1.2. The movement of traffic vehicles in both directions of the Otto Iskandardinata road in Samarinda City is generally quite smooth with types of vehicles ranging from non-motorized, motorized, light vehicles, motorized vehicles with varying speeds for each type of vehicle.

Table 1.2 Road Geometric Data

No	Karakteristik	Keterangan
1	Nama Jalan	Otto Iskandardinata
2	Fungsi	Kolektor
3	Tipe Jalan	2/2UD
4	Jenis Perkerasan	Rigid Pavement
5	Lebar Jalan	8.6 m
6	Panjang Jalan	960 m
7	Median Jalan	-
8	Situasi Sisi Jalan	Permukiman dan Toko

The total width of the road is 8.6 meters in 2 directions where each direction has a width of 4.3 meters, this road has no road markings and the median of the road as a lane separator, making it difficult for road users when driving on it.

Picture 1.2 Existing Condition of Jalan Otto Iskandardinata Samarinda City

Traffic Volume

Table 1.3 Traffic volume recapitulation on Thursday 14 February 2019 direction 1 (city direction to Anggana direction) and direction 2 (Anggana direction to city direction)

ARAH 1					ARAH 2				
Waktu	MC	LV	HV	UM	Waktu	MC	LV	HV	UM
07.00 - 08.00	864	194	10	25	07.00 - 08.00	506	127	3	19
08.00 - 09.00	877	171	14	22	08.00 - 09.00	612	216	13	25
09.00 - 10.00	940	267	15	33	09.00 - 10.00	728	379	9	8
11.00 - 12.00	1029	286	13	10	11.00 - 12.00	928	269	12	41
12.00 - 13.00	1154	318	42	14	12.00 - 13.00	1028	213	49	19
13.00 - 14.00	1261	381	31	0	13.00 - 14.00	1221	207	15	22
16.00 - 17.00	2580	707	33	23	16.00 - 17.00	1086	161	29	7
17.00 - 18.00	2330	575	20	10	17.00 - 18.00	1387	274	80	30
Total	11035	2899	178	137	Total	7496	1846	210	171

Source: Central Statistics Agency (BPS) of Samarinda City

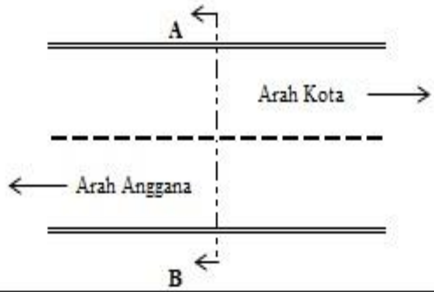
To make it easier to see the results of calculations, the authors will enter the calculation results into the forms UR 1, UR 2, and UR 3 as follows:

Table 1.4 Form UR 1

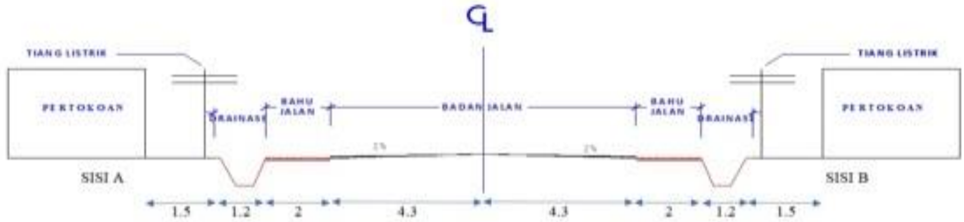
Formulir UR - 1

JALAN PERKOTAAN	Tanggal	: 14 Feb 2019	Ditangani oleh	: M. Sahrani AR
FORMULIR UR-1 : DATA MASUKAN	Provinsi	: Kalimantan Timur	Diperiksa oleh	
- DATA UMUM	Kota	: Samarinda	Ukuran kota	: 0,5 - 1,0 juta
- GEOMETRIK JALAN	No.ruas/Nama jalan	: Jalan Otto Iskandar Dinata		
	Kode segmen		Tipe daerah	: Perkotaan
	Panjang(m)	: 960	Tipe jalan	: 2/2 UD
	Periode waktu	: Jam Puncak Kamis		

Rencana situasi :



Penampang melintang :



	Sisi A	Sisi B	Total	Rata-rata
Lebar jalur lalu-lintas rata-rata	4.3	4.3	8.6	4.3
Kereb (K) atau Bahu (B)	B	B		
Jarak kereb - penghalang (m)	-	-	-	-
Lebar efektif bahu (dalam + luar) (m)	2	2	4	2

Bukaan median (tidak ada, sedikit, banyak)	

Kondisi Pengaturan lalu-lintas

Batas kecepatan (km/jam)	
Pembatasan akses untuk tipe kendaraan tertentu	
Pembatasan parkir (periode waktu)	
Pembatsan berhenti (periode waktu)	
Lain-lain	

Table 1.5 Form UR 2

Formulir UR - 2

JALAN PERKOTAAN	Tanggal:	: 14 Feb 2019	Ditangani oleh:	M. Sahrani AR
FORMULIR UR - 2 : DATA MASUKAN	No.ruas/Nama jalan	: Jalan Otto Iskandar Dinata		
- ARUS LALU LINTAS	Kode segmen:		Diperiksa oleh:	
- HAMBATAN SAMPING	Periode waktu:	Jam puncak Kamis		

Lalu lintas harian rata-rata tahunan

LHRT (kend/hari)				Faktor-k =	0.09		pemisah arah 1/arah 2 =	50/50
komposisi %	LV %	53	HV %	9	MC %	38		

Data arus kendaraan/jam

Baris	Tipe kend.	Kend. Ringan		Kend. Berat		Sepeda Motor		Arus total Q		
1.1	emp arah 1	LV:	1.0	HV:	1.2	MC:	0.25			
1.2	emp arah 2	LV:	1.0	HV:	1.2	MC:	0.25			
2	Arah (1)	kend/jam (2)	smp/jam (3)	kend/jam (4)	smp/jam (5)	kend/jam (6)	smp/jam (7)	Arah % (8)	kend/jam (9)	smp/jam (10)
3	1	707	707	33	39.6	2580	645	50	3320	1391.6
4	2	274	274	80	96	1387	346.75	50	1741	716.75
5	1 + 2	981	981	113	135.6	3967	991.75	100	5061	2108.35
6						Pemisah arah, SP = $Q_1/(Q_{1+2})$			66%	
7						Faktor-smp F_{smp} =				0.42

1

Kelas hambatan samping

Bila data rinci tersedia, gunakan tabel pertama untuk menentukan frekwensi berbobot kejadian, dan selanjutnya gunakan tabel kedua. Bila tidak, gunakan hanya tabel kedua.

1. Penentuan frekwensi kejaidan

Perhitungan frekwensi berbobot kejadian per 200 m dari segmen jalan yang diamati, pada kedua sisi jalan

Tipe hambatan samping	Simbol	Faktor bobot	Frekwensi kejadian		Frekwensi berbobot
[20]	[21]	[22]	[23]		[24]
Pejalan kaki	PED	0.5	478	/jam,200m	239
Parkir, kendaraan berhenti	PSV	1.0	119	/jam,200m	119
Kendaraan masuk + keluar	EEV	0.7	201	/jam,200m	141
Kendaraan lambat	SMV	0.4	151	/jam,200m	60
Total :					559

2. Penentuan kelas hambatan samping

Frekwensi berbobot kejadian	Kondis khusus	Kelas hambatan samping	
[30]	[31]	[32]	[33]
< 100	Permukiman, hampir tidak ada kegiatan	Sangat rendah	VL
100 - 299	Permukiman, beberapa angkutan umum, dll.	Rendah	L
300 - 499	Daerah industri dengan toko-toko di sisi jalan	Sedang	M
500 - 899	Daerah niaga dengan aktivitas sisi jalan yang ting	Tinggi	H
> 900	Daerah niaga & aktivitas pasar sisi jalan yg sanga	Sangat tinggi	VH

Table 1.6 Form UR 3

Formulir UR - 3

JALAN PERKOTAAN FORMULIR UR - 3 : ANALISA KECEPATAN, KAPASITAS	Tanggal:	14 Febuari 2019	Ditangani oleh:	M. Sahrani AR
	No.ruas/Nama jalan:	Jalan Otto Iskandardinata		
	Kode segmen:		Diperiksa oleh:	
	Periode waktu:	Jam puncak Kamis		

Kecepatan arus bebas kendaaan ringan $FV = (FV_0 + FV_w) \times FFV_{SF} \times FFV_{CS}$

Soal/ Arah	Kecepatan arus bebas dasar FV_0 Tabel 2.2 (km/jam)	Faktor penyesuaian untuk lebar jalur FV_w Tabel 2.3 (km/jam)	$FV_0 + FV_w$ (2) + (3) (km/jam)	Faktor penyesuaian: Hambatan samping FFV_{SF} Tabel 2.4	Faktor penyesuaian: Ukuran kota FFV_{CS} Tabel 2.5	Kecepatan arus bebas FV (4) x (5) x (6) (km/jam)
[1]	[2]	[3]	[4]	[5]	[6]	[7]
	42	4	46	0.95	0.95	41.52

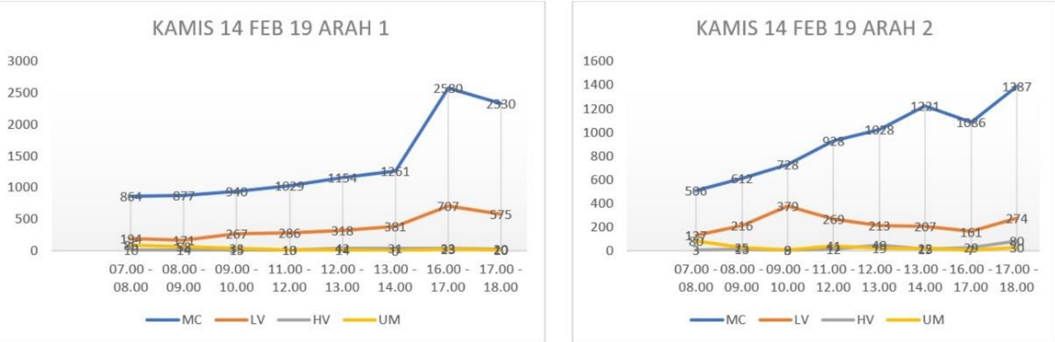
Kapasitas $C = C_0 \times FC_W \times FC_{SP} \times FC_{SF} \times FC_{CS}$

Soal/ Arah	Kapasitas dasar Co Tabel 2.6 (smp/jam)	Faktor penyesuaian untuk kapasitas: Lebar jalur FC_W Tabel 2.7	Pemisah arah FC_{SP} Tabel 2.8	Hambatan samping FC_{SF} Tabel 2.9	Ukuran kota FC_{CS} Tabel 2.10	Kapasitas C (smp/jam) 11)x(12)x(13)x(14)x(15
[10]	[11]	[12]	[13]	[14]	[15]	[16]
	2900	1.25	1.00	0.95	0.94	3237.125

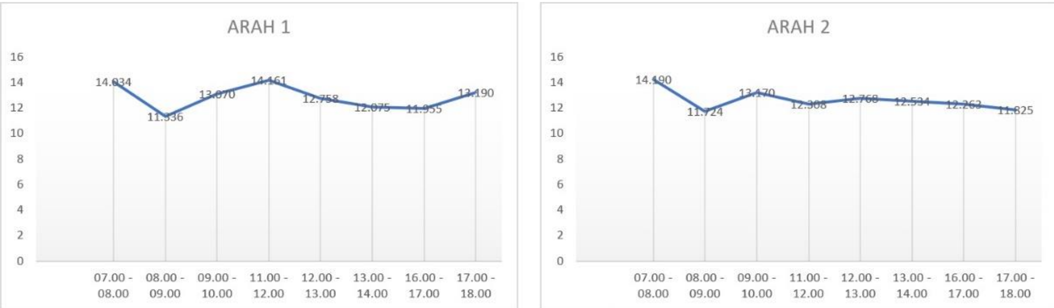
Kecepatan kendaran ringan

Soal/ Arah	Arus lalu lintas Q Formulir UR-2 smp/jam	Derajat Kejenuhan DS (21)/(16)	Kecepatan V_{LV} Gambar 2.1 Km/jam	Panjang Segmen jalan L Km	Waktu tempuh TT (24/23) jam
[20]	[21]	[22]	[23]	[24]	[25]
	2108.35	0.65	32	0.96	0.0300

Relationship between Motorcycle Vehicle Volume and Traffic Speed



Picture 1.3 Graph of traffic volume Thursday, February 14, 2019 direction 1 (direction of the city heading towards Anggana) and direction 2 (direction of Anggana toward the direction of the city)



Picture 1.4 Motor vehicle speed chart Thursday Thursday February 14 2019 direction 1 (city direction to Anggana direction) and direction 2 (Anggana direction to city direction)

Based on the above results, it can be seen that when the volume of the vehicle is small ie in the morning the vehicle speed when passing is relatively high and when the traffic volume has increased during the evening the traffic speed decreases.

Change the road type to 4 / 2UD as an alternative solution

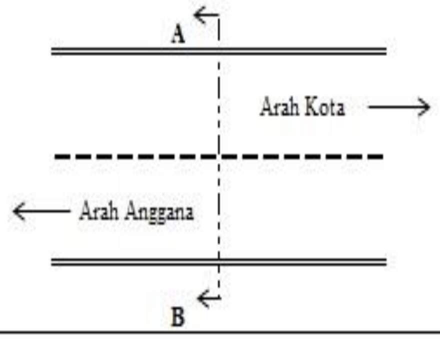
In this calculation, the data used as a reference for Thursday, February 14, 2019 are due to the densest day during observations in the field. Then the calculation results are obtained as follows:

Table 4.12 Form UR 1

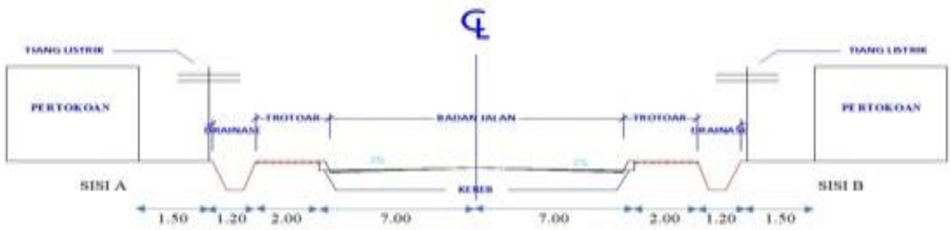
Formulir UR - 1

JALAN PERKOTAAN	Tanggal	: 14 Feb 2019	Ditangani oleh	: M. Sahrani AR
FORMULIR UR-1 : DATA MASUKAN	Provinsi	: Kalimantan Timur	Diperiksa oleh	
- DATA UMUM	Kota	: Samarinda	Ukuran kota	: 0,5 - 1,0 juta
- GEOMETRIK JALAN	No.ruas/Nama jalan	: Jalan Otto Iskandar Dinata		
	Kode segmen		Tipe daerah	: Perkotaan
	Panjang(m)	: 960	Tipe jalan	: 4/2 UD
	Periode waktu	: Jam Puncak Kamis		

Rencana situasi :



Penampang melintang :



	Sisi A	Sisi B	Total	Rata-rata
Lebar jalur lalu-lintas rata-rata	7.0	7.0	14.0	7.0
Kereb (K) atau Bahu (B)	K	K		
Jarak kereb - penghalang (m)	3.2	3.2	6.4	3.2
Lebar efektif bahu (dalam + luar) (m)	-	-	-	-

Bukaan median (tidak ada, sedikit, banyak)	

Kondisi Pengaturan lalu-lintas

Batas kecepatan (km/jam)	
Pembatasan akses untuk tipe kendaraan tertentu	
Pembatasan parkir (periode waktu)	
Pembatsan berhenti (periode waktu)	
Lain-lain	

Table 4.13 Form UR 2

Formulir UR - 2

JALAN PERKOTAAN	Tanggal:	: 14 Feb 2019	Ditangani oleh:	M. Sahrani AR	
FORMULIR UR - 2 : DATA MASUKAN	No.ruas/Nama jalan	: Jalan Otto Iskandar Dinata			
- ARUS LALU LINTAS	Kode segmen:		Diperiksa oleh:		
- HAMBATAN SAMPING	Periode waktu:	Jam puncak Kamis			

Lalu lintas harian rata-rata tahunan

LHRT (kend/hari)			Faktor-k =	0.09	pemisah arah 1/arah 2 =	50/50		
komposisi %	LV %	53	HV %	9	MC %	38		

Data arus kendaraan/jam

Baris	Tipe kend.	Kend. Ringan		Kend. Berat		Sepeda Motor		Arus total Q		
1.1	emp arah 1	LV:	1.0	HV:	1.2	MC:	0.25			
1.2	emp arah 2	LV:	1.0	HV:	1.2	MC:	0.25			
2	Arah (1)	kend/jam (2)	smp/jam (3)	kend/jam (4)	smp/jam (5)	kend/jam (6)	smp/jam (7)	Arah % (8)	kend/jam (9)	smp/jam (10)
3	1	707	707	33	39.6	2580	645	50	3320	1391.6
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5	1 + 2	981	981	113	135.6	3967	991.75	100	5061	2108.35
6						Pemisah arah, SP = $Q_1/(Q_{1+2})$			66%	
7						Faktor-smp F_{smp} =				0.42

Kelas hambatan samping

Bila data rinci tersedia, gunakan tabel pertama untuk menentukan frekwensi berbobot kejadian, dan selanjutnya gunakan tabel kedua. Bila tidak, gunakan hanya tabel kedua.

1. Penentuan frekwensi kejaidan

Perhitungan frekwensi berbobot kejadian per 200 m dari segmen jalan yang diamati, pada kedua sisi jalan	Tipe hambatan samping	Simbol	Faktor bobot	Frekwensi kejadian		Frekwensi berbobot
	[20]	[21]	[22]	[23]		[24]
	Pejalan kaki	PED	0.5	478	/jam,200m	239
	Parkir, kendaraan berhenti	PSV	1.0	119	/jam,200m	119
	Kendaraan masuk + keluar	EEV	0.7	201	/jam,200m	141
	Kendaraan lambat	SMV	0.4	151	/jam,200m	60
	Total :					559

2. Penentuan kelas hambatan samping

Frekwensi berbobot kejadian	Kondis khusus	Kelas hambatan samping	
[30]	[31]	[32]	[33]
< 100	Permukiman, hampir tidak ada kegiatan	Sangat rendah	VL
100 - 299	Permukiman, beberapa angkutan umum, dll.	Rendah	L
300 - 499	Daerah industri dengan toko-toko di sisi jalan	Sedang	M
500 - 899	Daerah niaga dengan aktivitas sisi jalan yang ting	Tinggi	H
> 900	Daerah niaga & aktivitas pasar sisi jalan yg sanga	Sangat tinggi	VH

Table 4.11 Form UR 3

Formulir UR - 3

JALAN PERKOTAAN	Tanggal:	14 Febuari 2019	Ditangani oleh:	M. Sahrani AR
FORMULIR UR - 3 : ANALISA	No.ruas/Nama jalan	Jalan Otto Iskandardinata		
KECEPATAN, KAPASITAS	Kode segmen:		Diperiksa oleh:	
	Periode waktu:	Jam puncak Kamis		

Kecepatan arus bebas kendaaan ringan $FV = (FV_0 + FV_w) \times FFV_{SF} \times FFV_{CS}$

Soal/ Arah	Kecepatan arus bebas dasar FV_0 Tabel 2.2 (km/jam)	Faktor penyesuaian untuk lebar jalur FV_w Tabel 2.3 (km/jam)	$FV_0 + FV_w$ (2) + (3) (km/jam)	Faktor penyesuaian Hambatan samping FFV_{SF} Tabel 2.4	Faktor penyesuaian Ukuran kota FFV_{CS} Tabel 2.5	Kecepatan arus bebas FV (4) x (5) x (6) (km/jam)
[1]	[2]	[3]	[4]	[5]	[6]	[7]
	51	0	51	0.94	0.95	45.54

Kapasitas $C = C_0 \times FC_w \times FC_{SP} \times FC_{SF} \times FC_{CS}$

Soal/ Arah	Kapasitas dasar Co Tabel 2.6 (smp/jam)	Faktor penyesuaian untuk kapasitas: Lebar jalur FC_W Tabel C-2.1	Pemisah arah FC_{SP} Tabel 2.8	Hambatan samping FC_{SF} Tabel 2.9	Ukuran kota FC_{CS} Tabel 2.10	Kapasitas C (smp/jam) (11)x(12)x(13)x(14)x(15)
[10]	[11]	[12]	[13]	[14]	[15]	[16]
	6000	1.00	1.00	0.93	0.94	5245.2

Kecepatan kendaran ringan

Soal/ Arah	Arus lalu lintas Q Formulir UR-2 smp/jam	Derajat Kejenuhan DS (21)/(16)	Kecepatan V_{LV} Gambar 2.3 Km/jam	Panjang Segmen jalan L Km	Waktu tempuh TT (24/23) jam
[20]	[21]	[22]	[23]	[24]	[25]
	2108.35	0.40	43	0.96	0.0223

Based on the calculation above, the results show that after the road type is changed from 2/2 UD to 4/2 UD, it can be seen that the degree of saturation has improved from 0.65 (2 / 2UD) to 0.40 (4/2 UD). So the road with type 4/2 UD shows better ability to accommodate the traffic flow on the Otto Iskandardinata road in Samarinda City.

Conclusion

Based on the results of calculations and analysis in chapter IV, it can be concluded that:

1. *The current volume of motorcycle vehicles passing through the Otto Iskandardinata road in Samarinda is as follows:*

    a. *At observation point 1 (Sungai Dama Market Intersection) the largest volume of motorcycle vehicles occurred on Thursday, February 14 2019 direction 1 namely: MC = 11035 vehicles / hour, and direction 2 MC = 7496 vehicles / hour, and the volume of motorcycle vehicles the smallest occurred on Sunday 17 February 2019 direction 1 namely: MC = 7210 vehicles / hour, and direction 2 MC = 6717 vehicles / hour.*

    b. *At observation point 2 (Gunung Manggah) the largest volume of motorcycle vehicles occurred on Friday 22 February 2019 direction 1 namely: MC = 8352 vehicles / hour, and direction 2 MC = 8998 vehicles / hour, and the smallest volume of motorcycle vehicles occurred on Sunday February 24 2019 direction 1 namely: MC = 7973 vehicles / hour, and direction 2 MC = 8232 vehicles / hour.*

2. *The influence of the volume of motorcycle vehicles on traffic speeds on the current Otto Iskandardinata road in Samarinda is as follows:*

    a. *Can be seen at observation point 1 (Simpang Empat Sungai Dama Market) the largest volume of motorcycle vehicles occurred on Thursday, February 14 2019 direction 1 namely: MC = 11035 vehicles / hour with a speed of 12.8223 km / hour, and direction of 2 MC = 7496 vehicles / hour with a speed of 12.5979 km / hour, and the smallest volume of motorcycle vehicles occurred on Sunday February 17 2019 direction 1 namely: MC = 7210 vehicles / hour with a speed of 13.2537 km / hour, and direction 2 MC = 6717 vehicles / hour with a speed of 13.4747 km / hour.*

    b. *At observation point 2 (Gunung Manggah) the largest volume of motorcycle vehicles occurred on Friday 22 February 2019 direction 1 namely: MC = 8352 vehicles / hour at a speed of 12.6707 km / hour, and direction 2 MC = 8998 vehicles / hour with a speed of 13,3283 km / hour, and the smallest volume of motorcycle vehicles occurred on Sunday February 24 2019 direction 1 namely: MC = 7973 vehicles / hour with a speed of 13.3199 km / hour, and direction 2 MC = 8232 vehicles / hour with a speed of 13.4747 km / hour.*

3. *The solution that can be done to overcome the problems in the Otto Iskandardinata Road in Samarinda City is to change the type of the road that was originally from 2 / 2UD to 4 / 2UD. It can be seen that the change in the degree of saturation has improved from 0.65 (2/2UD) to 0.40 (4/2 UD). So the road with type 4/2 UD shows better ability to accommodate the traffic flow on the Otto Iskandardinata road in Samarinda City.*

Suggestion

Further research should be conducted on the Otto Iskandardinata road section in order to get more references on the road.

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