

ANALYSIS OF PARKING CHARACTERISTICS AND THE EFFECT OF ON STREET PARKING ON TRAFFIC PERFORMANCE (Study Case on Kartini Street, Salatiga City)

Avita Zulvia^{1*}, Muhammad Debby Rizani², Putri Anggi Permata S.³

¹Faculty of Engineering and Informatics, Universitas PGRI Semarang, Jl. Sidodadi-Timur No.24 Semarang, Central Java 50232, Indonesia

²Faculty of Engineering and Informatics, Universitas PGRI Semarang, Jl. Sidodadi-Timur No.24 Semarang, Central Java 50232, Indonesia

³Faculty of Engineering and Informatics, Universitas PGRI Semarang, Jl. Sidodadi-Timur No.24 Semarang, Central Java 50232, Indonesia

*avitazulvia14@gmail.com

Abstract. The space are available for park vehicle on the edge road in the area center city and along main street thing to do with permanent there is restrictions and controls as well as Settings or often called on street parking(Clarkson Grg Lesby and Bary Hicks, 1988). Study this background behind by trouble performance then traffic that is less than optimal is caused by the presence of on street parking on lane bicycle on Kartini Street, Salatiga City. In resolve problem the required existence analysis about characteristics parking and influence on-street parking along Kartini Street, Salatiga City. Method used in study this that is method approach descriptive quantitative. Collecting the data obtained from results interview, notes field, documentation private, notes researchers, and documents residents other. Study this show that characteristics parking and influence on-street parking to performance then traffic on Kartini Street, Salatiga City for duration parking belong to Category 1 and significant high turnover duration short, in general vehicle parking not enough from one hour with duration parking short in general for parking in the center spending, with capacity street 2489,22 pcu/hour, speed current free 37,665 km/hour vehicles as well as level service belong to category Level Of Service (LOS) B (0.20-0.44) with characteristics current stable, speed a little limited by past traffic, driver still could free in choose the speed.

Keywords: parking, on street parking, characteristics

1. Introduction

Salatiga is a the city between Semarang City and Surakarta City. Now, Salatiga is a once of many cities develop in many sector specifically tourism. fast developments in the sector recreation in city without

there is a parking area special cause problem that is existence parking on the edge segment Street with then active traffic as well as in the area ban parking.

According to Constitution Republic of Indonesia No. 22 of 2009 regarding then traffic and transportation Street Article 1, paragraph 15, which states: that, parking is " state " vehicle stop or no move for a number of time and left the driver ".

On-street parking or parking edge Street reasonable found city big landless special for parking. Observation beginning showing that along Kartini Street, Salatiga City is an area for schools, offices, commerce as well as There is also a recreation area family that is Tuesday Kartini so that at times certain volume of available off street parking no enough accommodate Request existing parking [1].

With lack of parking area so arise existence parking on the edge road. Moment This is on street parking on Kartini Street, Salatiga City is parking illegal because utilise track bicycle for which way to park bicycle is area ban for parking. There are also problems setting parking that doesn't adequate and neat that affects performance then cross so that reduce effectiveness Street main Kartini City of Salatiga.

Based on description background back, then obtained formula problem as following:

- a. How characteristics parking on Kartini Street, Salatiga City?
- b. How influence on-street parking to performance then the existing traffic on Kartini Street, Salatiga City?

Desired goal achieved in study this are:

- a. Knowing characteristics parking on Kartini Street, Salatiga City.
- b. Knowing influence on street parking against performance then the existing traffic on Kartini Street, Salatiga City.

As for what becomes limitation problem is as following:

- a. Segment surveyed roads is along Kartini Street, Salatiga City (in front of SMA Negeri 3 Salatiga)
- b. Planning done on one side road (west to direction east)
- c. Rule parking refer to the Guidelines Planning and Operation Facility Parking issued by the Directorate General Communication Land(1998).
- d. Due to influence current then cross usually happens in the morning and evening so conducted a survey on two period time that is 06.00-09.00 and 15.00-18.00 (Monday, Wednesday, and Saturday).

2. Methods

By general study this conducted through a number of stages such as:

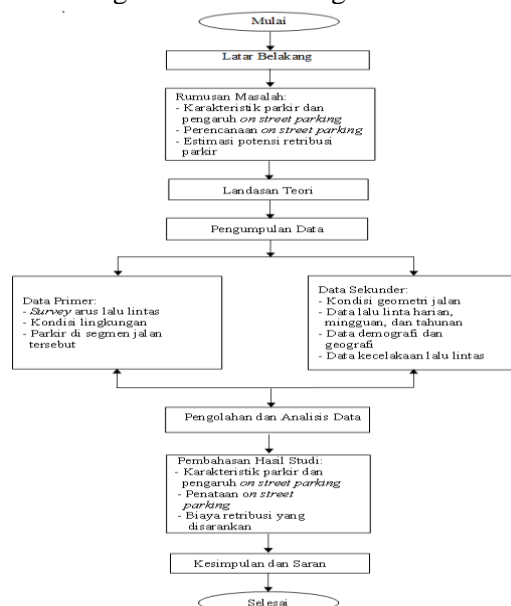


Figure 2.1 Flowchart Study
Source: Researcher, 2022

Research location conducted along Kartini Street, Salatiga City. Data collection is carried out with way:

- a. Primary data
Is a database or main used in kind of research the data collected by direct from source main like through interviews, surveys, experiments, and so on. These data relate direct with planning transportation for resolve problem performance of Kartini Street, Salatiga City in front of SMA Negeri 3 Salatiga. Which includes primary data in study this that is, current survey data then cross, condition environment, and circumstances parking in segment Street that.
- b. Secondary Data
Is supporting data that has been processed more first. Secondary data sources is journals, articles, publications government, and other supporting sources. Which includes secondary data in study this that is, condition geometry road, past data traffic, demographic data, geographic data, and accident data then cross.

3. Results and Discussion

3.1 Characteristics Parking

a. Duration Parking

on the day Saturday 29 January 2022 there are vehicle Wheels 4 (four) with the number plate AD 9121 EM enter the parking area 15:22 and out from the parking area 16.15 then ;

$$D = \text{Extime} - \text{Entime}$$

$$D = 16.15 - 15.22$$

$$D = 53 \text{ minutes ;(3.1)}$$

Where:

D = average length of parking or duration(hours/ vehicle)

Extime = time moment vehicle go out from location parking (depart)

Entime = time moment vehicle enter to location parking (arrival)

Then on the day the During at the time of the survey there were 14 vehicles Wheels 4 (four) with a long time total parking 577 minutes so duration average parking day Saturday i.e. 41 minutes or 0.69 hours. As seen in Table 3.1:

Table 3.1 Duration Parking Vehicle Wheel 4 (four)

No.	Hari, Tanggal	Jumlah Kendaraan Parkir (6 Jam)	Lama Waktu Parkir (Menit)	Durasi Parkir Rata-rata (jam)
1	Sabtu, 29 Januari 2022	14	577	0,69
2	Senin, 31 Januari 2022	7	184	0,44
3	Rabu, 02 Februari 2022	3	93	0,52

Source: Researcher Analysis, 2022

In table 4.1 shows duration highest average parking vehicle Wheels 4(four) for time study happened on the day Saturday, January 9, 2022 i.e reach 41 minutes or 0.69 hours, while the lowest happened on the day Monday with duration parking average 26 minutes or 0.44 hours.

Table 3.2 Duration Parking Vehicle Wheel 2 (two)

No.	Hari, Tanggal	Jumlah Kendaraan Parkir (6 Jam)	Lama Waktu Parkir (Menit)	Durasi Parkir Rata-rata (jam)
1	Sabtu, 29 Januari 2022	43	1355	0,53
2	Senin, 31 Januari 2022	36	1100	0,51
3	Rabu, 02 Februari 2022	31	1074	0,58

Source: Researcher Analysis, 2022

In table 3.2 it can be seen that duration highest average parking vehicle Wheels 2 (two) for time study occurred on Wednesday, February 2, 2022 reach 35 minutes or 0.58 hours, while the lowest happened on the day Monday with duration parking average 31 minutes or 0.51 hours.

Table 3.3 Categories Duration Parking Based on Length of Time

Kategori	Keterangan
1	Durasi parkir pendek, pada umumnya kendaraan parkir kurang dari satu jam
2	Durasi parkir menengah, pada umumnya kendaraan parkir selama 2-4 jam
3	Durasi parkir panjang, pada umumnya kendaraan parkir selama 12-16 jam
4	Durasi parkir lebih dari satu malam

Sumber: Evriyani, D., Nahry, dan Soehodho, S., 2014

Category duration parking vehicle 2 (two) and 4 (four) wheels on Kartini Street, Salatiga City based on including into the Category 1 is duration short, in general vehicle parking not enough from one hour.

b. Substitution Parking (Parking Turnover)

Based on the average vehicle parking survey Wheel 4(four) there are 10 vehicles and the Minimum Width Table for One Way Primary Local Road for Road Agency Parking and SRP Table sourced from the Guidelines Planning and Operation Facility Parking issued by the Directorate of City Transport Traffic System Development [2] and the Directorate General Communication Land [3] then, total plot used parking i.e. 10 plots parking Wheels 4 (four) with provision position parking 0 ° with an SRP of 2.5m x 5m. So that could is known score Substitution Turnover (TR) in days Saturday, January 29, 2022, namely:

$$TR = Nt / (S \cdot Ts)$$

$$TR = 19 / (10 \times 6)$$

$$TR = 0.32 \text{ vehicles/plot/hour}; \dots (4.2)$$

Where:

TR = turnover rate parking (vehicle/ SRP/hour)

Nt = Total number of vehicles During survey time (vehicle)

S = Total plot parking available on site studies

Ts = Length of period analysis or survey time (hours)

Table 3.4 Parking Turnover Wheel Four

No.	Hari, Tanggal	Total Kendaraan (Nt)	Total Petak (S)	Periode Survey (Ts)(jam)	Parking Turn Over (TR=Nt/(S.Ts)) (kend/petak/jam)
1	Sabtu, 29 Januari 2022	19	10	6	0,32
2	Senin, 31 Januari 2022	7	10	6	0,12
3	Rabu, 02 Februari 2022	5	10	6	0,08

Source: Researcher Analysis, 2022

In table 3.4 it can be seen that day Saturday 29 January 2022 shows highest TR value with 0.32 vehicles/ plot/hour while lowest TR value available on Wednesday 02 February 2022 with value of 0.08 vehicles/ plot/ hour.

Table 3.5 Parking Turnover Wheel Two

No.	Hari, Tanggal	Total Kendaraan (Nt)	Total Petak(S)					Periode Survey (Ts)(jam)	Parking Turn Over (TR=Nt/(S.Ts)) (kend/petak/jam)				
			0°	30°	45°	60°	90°		0°	30°	45°	60°	90°
1	Sabtu, 29 Januari 2022	64	35	90	90	90	90	6	0,30	0,12	0,12	0,12	0,12
2	Senin, 31 Januari 2022	48	35	90	90	90	90	6	0,23	0,09	0,09	0,09	0,09
3	Rabu, 02 Februari 2022	40	35	90	90	90	90	6	0,19	0,07	0,07	0,07	0,07

Source: Researcher Analysis, 2022

In table 3.5 it can be seen that day Saturday 29 January 2022 shows highest TR value with 0.30 and 0.12 vehicles/ plot/hour while lowest TR value available on Wednesday 02 February 2022 with values of 0.19 and 0.07 vehicles/plot/hour.

Table 3.6 Parking Turnover Categories Based on Length of Time

Kategori Parking Turnover	Contoh Tipe Pengguna
Low turnover	Durasi parkir sepanjang hari
Medium turnover	Durasi parkir antara 2-12 jam, pada umumnya untuk parkir apartemen dan hotel
High turnover	Durasi parkir pendek, pada umumnya untuk parkir di pusat perbelanjaan

Sumber: Evriyani, D., Nahry, dan Soehodho, S., 2014

Category Parking Turnover based on above, then the location of the survey belong to high turnover category, namely duration parking short in general for parking in the center which expenditure is less? of 2 hours.

1. Influence On Street Parking
 - a. Road Capacity

Table 3. 7 Basic Capacity of Urban Roads

Tipe jalan	Kapasitas dasar (smp/jam)	Catatan
Empat-lajur terbagi atau Jalan satu-arah	1650	Per lajur
Empat-lajur tak-terbagi	1500	Per lajur
Dua-lajur tak-terbagi	2900	Total dua arah

Source: Manual of Indonesian Road Capacity Manual [4]

Table 3.8 Corrections Capacity Due to Road Width (FC_w)

Tipe jalan	Lebar jalur lalu-lintas efektif (W_e) (m)	FC_w
Empat-lajur terbagi atau Jalan satu-arah	Per lajur	
	3,00	0,92
	3,25	0,96
	3,50	1,00
	3,75	1,04
	4,00	1,08
Empat-lajur tak-terbagi	Per lajur	
	3,00	0,91
	3,25	0,95
	3,50	1,00
	3,75	1,05
	4,00	1,09
Dua-lajur tak-terbagi	Total dua arah	
	5	0,56
	6	0,87
	7	1,00
	8	1,14
	9	1,25
	10	1,29
	11	1,34

Source: Manual of Indonesian Road Capacity Manual [4]

Table 3.9 Capacity Adjustment Factor for Directional Separation (FC_{SP})

Pemisahan arah SP %-%		50-50	60-40	70-30	80-20	90-10	100-0
FC_{sp}	Dua lajur 2/2	1,00	0,94	0,88	0,82	0,76	0,70
	Empat lajur 4/2	1,00	0,97	0,94	0,91	0,88	0,85

Source: Manual of Indonesian Road Capacity Manual [4]

Description: If the road is divided or a one-way street, use a value equal to 1.00

Table 3. 10 Factors for Adjusting Side Barriers (FC_{SF}) with Road Shoulders

Tipe jalan	Kelas hambatan samping	Faktor penyesuaian untuk hambatan samping dan lebar bahu FC_{SF}			
		Lebar bahu efektif W_s			
		$\leq 0,5$	1,0	1,5	$\geq 2,0$
4/2 D	VL	0,96	0,98	1,01	1,03
	L	0,94	0,97	1,00	1,02
	M	0,92	0,95	0,98	1,00
	H	0,88	0,92	0,95	0,98
	VH	0,84	0,88	0,92	0,96
4/2 UD	VL	0,96	0,99	1,01	1,03
	L	0,94	0,97	1,00	1,02
	M	0,92	0,95	0,98	1,00
	H	0,87	0,91	0,94	0,98
	VH	0,80	0,86	0,90	0,95
2/2 UD atau Jalan satu-arah	VL	0,94	0,96	0,99	1,01
	L	0,92	0,94	0,97	1,00
	M	0,89	0,92	0,95	0,98
	H	0,82	0,86	0,90	0,95
	VH	0,73	0,79	0,85	0,91

Source: Manual of Indonesian Road Capacity Manual [4]

Table 3. 11 Factors for Adjusting Side Barriers (FC_{SF}) with Road Krebs

Tipe jalan	Kelas hambatan samping	Faktor penyesuaian untuk hambatan samping dan jarak kereb-penghalang FC_{SF}			
		Jarak: kereb-penghalang W_k			
		$\leq 0,5$	1,0	1,5	$\geq 2,0$
4/2 D	VL	0,95	0,97	0,99	1,01
	L	0,94	0,96	0,98	1,00
	M	0,91	0,93	0,95	0,98
	H	0,86	0,89	0,92	0,95
	VH	0,81	0,85	0,88	0,92
4/2 UD	VL	0,95	0,97	0,99	1,01
	L	0,93	0,95	0,97	1,00
	M	0,90	0,92	0,95	0,97
	H	0,84	0,87	0,90	0,93
	VH	0,77	0,81	0,85	0,90
2/2 UD atau Jalan satu-arah	VL	0,93	0,95	0,97	0,99
	L	0,90	0,92	0,95	0,97
	M	0,86	0,88	0,91	0,94
	H	0,78	0,81	0,84	0,88
	VH	0,68	0,72	0,77	0,82

Source: Manual of Indonesian Road Capacity Manual [4]

Table 3.11 Capacity Adjustment Factors for City Size

Ukuran kota (Juta penduduk)	Faktor penyesuaian untuk ukuran kota FC_{CS}
< 0,1	0,86
0,1 – 0,5	0,90
0,5 – 1,0	0,94
1,0 – 3,0	1,00
> 3	1,04

Source: Manual of Indonesian Road Capacity Manual [4]
 Geometry Data of Kartini Street, Salatiga City

No		Nama Ruas	Geometrik Jalan	Ket	Visualisasi Gambar
			Node	Awal Akhir	
			Klasifikasi Jalan	Status Jalan Fungsi Jalan	KOTA KOLEKTOR
			Panjang	(m)	460 m
			Lebar	(m)	6 ki: 3 ka: 3
			Jumlah Lajur		2
			Jumlah Jalur		2
			Tipe Jalan		2/2UD
			Model Anus (arah)		2 ARAH
			Lebar Parkir	(m)	1
			Lebar Efektif Jalan	(m)	8
			Median	(m)	-
			Trottoar Kiri	(m)	2
			Keran Kiri	(m)	1
			Drainase Kiri	(m)	-
			Keran Kiri	(m)	-
			Bahu Jalan Kiri	(m)	-
			Keran Kiri	(m)	-
			Jalur hijau	(m)	1
			Kondisi Jalan		BAIK
			Jenis Perkerasan		ASPAL
			Hambatan Samping		SEDANG
			Luas Kerusakan	(m ²)	-
			Jumlah akses		3
			Lampu	Jumlah	25
			Parkir on street	Sudut parkir	30°
			Marka	Kedaaan	BAIK
					SEPEDA MOTOR

Source: Data from the Department of Transportation Salatiga [1]

Quantity Data Salatiga City Residents year 2021

Jumlah Penduduk Kota Salatiga menurut Jenis Kelamin per Kelurahan			
KELURAHAN	LAKI-LAKI	PEREMPUAN	JUMLAH
Argomulyo	25172	25092	50264
Cebongan	2556	2575	5131
Kumpukrejo	4173	4138	8311
Ledok	5530	5506	11036
Noborejo	3324	3354	6678
Randuacir	3405	3396	6801
Tegarejo	6184	6123	12307
Sidomukti	22299	22755	45054
Dukuh	7072	7224	14296
Kalicacing	2996	3210	6206
Kecandran	3550	3508	7058
Mangunsari	8681	8813	17494
Sidorejo	26818	27466	54284
Blotongan	6554	6567	13121
Bugel	1757	1741	3498
Kauman Kidul	2078	2177	4255
Pulutan	2309	2319	4628
Salatiga	7120	7295	14415
Sidorejo Lor	7000	7367	14367
Tingkir	23093	23745	46838
Gendongan	2595	2729	5324
Kalibening	1191	1157	2348
Kutowinangun Lor	6461	6610	13071
Kutowinangun Kidul	3979	4217	8196
Sidorejo Kidul	3701	3822	7523
Tingkir Lor	2481	2534	5015
Tingkir Tengah	2685	2676	5361
Jumlah	97382	99058	196440

Source: Population and Registration Service Data Civil [5]

Based on Geometry Data of Kartini Street, Salatiga City and several Table Factor

Adjustment so found capacity Street as following:

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

$$C = 2900 \times 1,14 \times 0,94 \times 0,89 \times 0,9$$

$$C = 2489,22 \text{ smp/jam}; \dots \dots \dots (4.3)$$

Where:

- C = Capacity
- C₀ = Capacity base (Table 3.7 Basic Capacity of Urban Roads – two track not divided by two direction)
- FC_W = Factor adjustment wide track then cross (Table 3.8 Correction Capacity Due to Road Width – two lane not divided and the total width of the path effective 8 meters)
- FC_{SP} = Factor adjustment separator direction (Table 3.9 Factor Adjustment Capacity For separator Direction - two 2/2 lane and separation direction SP 60-40)
- FC_{SF} = Factor adjustment obstacle side Table 3.10 Factor Adjustment Obstacle Side By the Shoulder of the Road or Table 3.11 Factor Adjustment Obstacle Side With Kreb Jalan – 2/2 UD and class obstacle side of medium)
- FC_{CS} = Factor adjustment size city (Table 3.11 Factor Adjustment Capacity For City Size – size city 0.1-0.5 million resident)

According to analysis on Kartini Street, Salatiga City still in state safe because not yet beyond limit capacity base two lane not divided ie 2900 smp/hour.

b. Speed Current Free Vehicle

Table 3. 12 basic Free Flow Speed (FV₀) for Urban Street

Tipe jalan	Kecepatan arus bebas dasar (FV ₀) (km/jam)			
	Kendaraan ringan LV	Kendaraan berat HV	Sepeda motor MC	Semua kendaraan (rata-rata)
Enam-lajur terbagi (6/2 D) atau Tiga-lajur satu-arah (3/1)	61	52	48	57
Empat-lajur terbagi (4/2 D) atau Dua-lajur satu-arah (2/1)	57	50	47	55
Empat-lajur tak-terbagi (4/2 UD)	53	46	43	51
Dua-lajur tak-terbagi (2/2 UD)	44	40	40	42

Source: Manual of Indonesian Road Capacity Manual [4]

Table 3. 13 Speed Adjustment for Road Width (FV_w)

Tipe jalan	Lebar jalur lalu-lintas efektif (W_e) (m)	FV_w (km/jam)
Empat-lajur terbagi atau Jalan satu-arah	Per lajur	
	3,00	-4
	3,25	-2
	3,50	0
	3,75	2
	4,00	4
Empat-lajur tak-terbagi	Per lajur	
	3,00	-4
	3,25	-2
	3,50	0
	3,75	2
	4,00	4
Dua-lajur tak-terbagi	Total	
	5	-9,5
	6	-3
	7	0
	8	3
	9	4
	10	6
	11	7

Source: Manual of Indonesian Road Capacity Manual [4]

Table 3. 14 Factor Adjustment for Side Barrier (FFV_{SF}) with Shoulder Width

Tipe jalan	Kelas hambatan samping (SFC)	Faktor penyesuaian untuk hambatan samping dan lebar bahu			
		Lebar bahu efektif rata-rata W_s (m)			
		$\leq 0,5$ m	1,0 m	1,5 m	≥ 2 m
Empat-lajur terbagi 4/2 D	Sangat rendah	1,02	1,03	1,03	1,04
	Rendah	0,98	1,00	1,02	1,03
	Sedang	0,94	0,97	1,00	1,02
	Tinggi	0,89	0,93	0,96	0,99
	Sangat tinggi	0,84	0,88	0,92	0,96
Empat-lajur tak-terbagi 4/2 UD	Sangat rendah	1,02	1,03	1,03	1,04
	Rendah	0,98	1,00	1,02	1,03
	Sedang	0,93	0,96	0,99	1,02
	Tinggi	0,87	0,91	0,94	0,98
	Sangat tinggi	0,80	0,86	0,90	0,95
Dua-lajur tak-terbagi 2/2 UD atau Jalan satu-arah	Sangat rendah	1,00	1,01	1,01	1,01
	Rendah	0,96	0,98	0,99	1,00
	Sedang	0,91	0,93	0,96	0,99
	Tinggi	0,82	0,86	0,90	0,95
	Sangat tinggi	0,73	0,79	0,85	0,91

Source: Manual of Indonesian Road Capacity Manual [4]

Table 3. 15 Adjustment Factor for Side Barriers (FFV_{SF}) with Krib

Tipe jalan	Kelas hambatan samping (SFC)	Faktor penyesuaian untuk hambatan samping dan jarak krib-penghalang			
		Jarak: krib - penghalang W_k (m)			
		$\leq 0,5$ m	1,0 m	1,5 m	≥ 2 m
Empat-lajur terbagi 4/2 D	Sangat rendah	1,00	1,01	1,01	1,02
	Rendah	0,97	0,98	0,99	1,00
	Sedang	0,93	0,95	0,97	0,99
	Tinggi	0,87	0,90	0,93	0,96
	Sangat tinggi	0,81	0,85	0,88	0,92
Empat-lajur tak-terbagi 4/2 UD	Sangat rendah	1,00	1,01	1,01	1,02
	Rendah	0,96	0,98	0,99	1,00
	Sedang	0,91	0,93	0,96	0,98
	Tinggi	0,84	0,87	0,90	0,94
	Sangat tinggi	0,77	0,81	0,85	0,90
Dua-lajur tak-terbagi 2/2 UD atau Jalan satu-arah	Sangat rendah	0,98	0,99	0,99	1,00
	Rendah	0,93	0,95	0,96	0,98
	Sedang	0,87	0,89	0,92	0,95
	Tinggi	0,78	0,81	0,84	0,88
	Sangat tinggi	0,68	0,72	0,77	0,82

Source: Manual of Indonesian Road Capacity Manual [4]

Table 3. 16 Speed adjustment factor for city size (FFV CS)

Ukuran kota (Juta penduduk)	Faktor penyesuaian untuk ukuran kota
< 0,1	0,90
0,1 - 0,5	0,93
0,5 - 1,0	0,95
1,0 - 3,0	1,00
> 3,0	1,03

Source: Manual of Indonesian Road Capacity Manual [4]

Based on Geometry Data on Jalan Kartini, Salatiga City and several Adjustment Factor Tables, it is found that the free flow speed of vehicles is as follows:

$$FV = (FV_0 + FV_W) \times FFV_{SF} \times FFV_{CS}$$

$$FV = (42+3) \times 0,9 \times 0,93$$

$$FV = 37,665 \text{ km/jam}; \dots \dots \dots (4.4)$$

Where:

FV = free flow speed(km/h)

FV₀ = basic free current velocity

(km/h) Table 3.12 Current Speed

Basic Free For Urban Roads – 2/2 UD all vehicles on average)

FV_w = traffic lane width adjustment (km/hour) Table 3.13 Speed Adjustment for Road Width – two undivided lanes and an effective lane width of 8 meters)

FFV_{SF} = resistance adjustment factor

Side (Table 3.14 Adjustment Factor For Side Barriers With Road Shoulders or Table 3.15 Adjustment Factor For Side Barriers With Krebs –2/2UD medium side resistance class)

FFV_{CS} = city size adjustment factor (Table 3.16 Speed Adjustment Factor for City Size - city size 0.1-0.5 million inhabitants)

According to the above analysis for Urban Roads, the capacity of Kartini Streetin Salatiga City is still in a safe condition because it has not exceeded the basic free flow speed limit of two undivided lanes for all vehicles(on average) which is 42 km/hour.

c. Service Level Determinants

Based on the traffic flow survey, then:

Table 3.17 Vehicle Traffic Volume

Periode	Senin			Jumlah
	MC	LV	HV	
06.00 - 07.00	1062	139	0	1201
07.00 - 08.00	1145	173	0	1318
08.00 - 09.00	1133	121	1	1255
15.00 - 16.00	748	178	1	927
16.00 - 17.00	963	249	2	1214
17.00 - 18.00	733	223	0	956
Periode	Rabu			Jumlah
	MC	LV	HV	
06.00 - 07.00	908	144	0	1052
07.00 - 08.00	1313	136	4	1453
08.00 - 09.00	763	123	6	892
15.00 - 16.00	682	163	2	847
16.00 - 17.00	877	228	1	1106
17.00 - 18.00	668	204	2	874
Periode	Sabtu			Jumlah
	MC	LV	HV	
06.00 - 07.00	709	117	0	826
07.00 - 08.00	661	134	2	797
08.00 - 09.00	802	114	1	917
15.00 - 16.00	934	196	3	1133
16.00 - 17.00	1292	232	5	1529
17.00 - 18.00	990	183	1	1174

Source: Researcher Analysis, 2022

Where:

MC: Motorcycle (motorcycle) with emp 0.25

LV: Light vehicle (light vehicle) with emp 1.00

HV: Heavy vehicle (heavy vehicle) with emp 1.20

Table 3.18 Vehicle Traffic Volume After EMP

Periode	Senin			C	Volume	Derajat Kejujahan
	MC	LV	HV			
06.00 - 07.00	265,5	139	0	2489,22	404,5	0,16
07.00 - 08.00	286,25	173	0	2489,22	459,25	0,18
08.00 - 09.00	283,25	121	1,2	2489,22	405,45	0,16
15.00 - 16.00	187	178	1,2	2489,22	366,2	0,15
16.00 - 17.00	240,75	249	2,4	2489,22	492,15	0,20
17.00 - 18.00	183,25	223	0	2489,22	406,25	0,16
Periode	Rabu			C	Volume	Derajat Kejujahan
	MC	LV	HV			
06.00 - 07.00	227	144	0	2489,22	371	0,15
07.00 - 08.00	328,25	136	4,8	2489,22	469,05	0,19
08.00 - 09.00	190,75	123	7,2	2489,22	320,95	0,13
15.00 - 16.00	170,5	163	2,4	2489,22	335,9	0,13
16.00 - 17.00	219,25	228	1,2	2489,22	448,45	0,18
17.00 - 18.00	167	204	2,4	2489,22	373,4	0,15
Periode	Sabtu			C	Volume	Derajat Kejujahan
	MC	LV	HV			
06.00 - 07.00	177,25	117	0	2489,22	294,25	0,12
07.00 - 08.00	165,25	134	2,4	2489,22	301,65	0,12
08.00 - 09.00	200,5	114	1,2	2489,22	315,7	0,13
15.00 - 16.00	233,5	196	3,6	2489,22	433,1	0,17
16.00 - 17.00	323	232	6	2489,22	561	0,23
17.00 - 18.00	247,5	183	1,2	2489,22	431,7	0,17

Source: Researcher Analysis, 2022

Based on the results of the survey and data processing in the traffic survey, the degree of saturation (DS) in traffic volume at peak hours is:

- ✚ Vehicle volume after EMP:
 Volume MC x EMP = 1292 x 0.25 = 323
 Volume LV x EMP = 232 x 1.00 = 232
 Volume HV x EMP = 5 x 1.20 = 6
 Total volume = 561
- ✚ Capacity(C) : 2489.22 smp/hour;..... (3.3)
- ✚ Degree of saturation:
 DS = V/C
 DS = 561/2489.22
 DS = 0.23 : (3.5)

Where:

DS = Degree of Saturation

V = Vehicle volume after EMP

C = Capacity

Based on the above analysis, it is known that the degree of saturation or the highest level of service on Saturdays at 16.00-17.00 is 0.23. Therefore, the traffic volume on Jalan Kartini, Salatiga City, is classified as Level Of Service(LOS) B(0.20-0, 44) with stable flow characteristics, speed is slightly limited by traffic, drivers can still freely choose their speed.

4. Conclusion

a. Conclusion

Characteristics parking and the effect of on street parking on performance then traffic on Kartini Street, Salatiga City for duration parking belong to Category 1 is duration short, in

general vehicle parking not enough from one hour. Whereas for category Parking Turnover based on long time then, the location of the survey classified as high turnover for duration parking short in general for parking in the center spending, with capacity street 2489,22 pcu/hour, speed current free 37,665 km/hour vehicles as well as level service belong to category Level Of Service (LOS) B (0.20-0.44) with characteristics current stable, speed a little limited by past traffic, driver still could free in choose the speed.

b. Suggestion

- Party Salatiga City Government through related departments and agencies should more confirm return related regulation area as well as signs then cross regarding governance parking to use for increase order parking and smooth current then cross.
- Arrangement parking by manager parking more upgraded especially during peak hours or busy for the vehicle no cover Street or hinder circulation another vehicle.
- Supervision carried out in manage parking should more tightened up again.

Acknowledgements

The author would like to express his gratitude to those who have helped the author who cannot be mentioned one by one in completing this final project.

References

- [1] Directorate General Communication land. "Guidelines Planning and Operation Facility Parking", 1998
- [2] Department of Transportation Salatiga, "Data Geometry of Kartini Street, Salatiga City", 2018
- [3] Directorate General Communication land. "Implementation Technical Guidelines Facility Parking", 1996
- [3] Directorate General Communication land. "Indonesian Road Capacity Manual", 1997
- [4] Department of Population and Registration Civil, "Quantity Data Residents of Salatiga City", 2021