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THE EFFECT OF U-TURN ON TRAFFIC FLOW CHARACTERISTICS (A CASE STUDY: JENDRAL BASUKI RACHMAT ROAD, EAST JAKARTA)

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ABSTRACT

The way to minimize traffic problems, especially the safety and comfort of roads is to build medians. The median as part of the road geometry is a physical separator of traffic lanes that serves to relieve traffic conflicts from the opposite direction. So, it improves traffic safety with a reversal facility, analyzes the average travel time of vehicles when making a U-turn, and analyzes the level of service on the Jendral Basuki Rachmat road. Therefore, this research aimed to determine the volume of traffic on Jenderal Basuki Rachmat road, determine the average speed of turning vehicles and determine the service level on Jalan Jenderal Basuki Rachmat Road. This research used the 1997 MKJI methodology. The research results explained that the largest volume of vehicles that make U-turns was 19966 vehicles/hour with a road service level of D. The average travel time of vehicles was 15.3 seconds with a queue length of 50 meters for a U-turn.

Keywords: *U-Turn, Speed, Service Level*

1. PRELIMINARY

Vehicle users expect convenient and safe facilities on the road network. The way to minimize the problem of traffic movement, especially the safety and comfort of roads is to build a median. In median planning, there is a median opening to simplify the vehicle to change the direction, such as a reversal movement or a U-turn movement. One effect of the U-turn motion is the speed of the vehicle slowing down or stopping.

Jendral Basuki Rachmat road is a road that is in front of the Basura Mall, Basura City apartments and the Gembrong market. This road is in Jatinegara, East Jakarta. Jendral Basuki Rachmat road, which is right in front of Basura Mall and Basura City Apartments, is a 4-lane, 2-way, and 2-turn road on the west before the intersection and on the east before the intersection.

The research objectives were:

1. To determine the effect of the U-turn facility on Jenderal Basuki Rachmat road on the traffic flow characteristics on Jenderal Basuki Rachmat road.
2. To find out the number of vehicles turning around at the U-turn facility on Jenderal Basuki Rachmat road.

3. To find out the average travel time of vehicles when making a U-turn on Jenderal Basuki Rachmat road.

2. THEORETICAL FRAMEWORK

Transportation

Transportation is the business and activity of transporting or bringing goods and/or people from one place to another.

Road

In the Act No. 38 of 2004 article 1 paragraph (4), the definition of road is land transportation infrastructure covering all parts of the road, such as complementary buildings and traffic equipment on the surface of the land and water, and above the water surface, except for railroads, lorries and cable roads.

In the Indonesian Highway Capacity Manual (1997), road types are divided into:

1. A two-lane two-way street without a median (2/2 UD).
2. A four-lane and two-way street.
   a. Undivided / without median (4/2 UD).
   b. Divide / by median (4/2 D).
3. A six-lane two-way street divided by a median (6/2 D).
4. One way street (1-3/1).

Table 1. Median Minimum Width

Planning Class		Standard Minimum Width (m)	Specific Minimum Width (m)
TYPE I	Class 1	2.5	2.5
	Class 2	2.0	2.0
TYPE II	Class 1	2.0	1.0
	Class 2	2.0	1.0
	Class 3	1.5	1.0
	Class 3	1.5	1.0

Source: "Geometric Planning Standards for Urban Streets" (1992). Directorate General of Highways"

Table 2. Minimum Width of Median Opening (raising/lowering)

Road Function	Minimum width (m)		
	Median	Inside Shoulder	Road-Edge
Arteries	≥ 5,00	0,50	0,25
Collector/ Local	≥ 4,00	0,50	0,25

Source: Construction and Building Guidelines (2004), Department of Settlement and Regional Infrastructure.

Table 3. Minimum Distance Between Opening and Opening Width

Road Function	Out of town		Urban		
	Opening Distance (dl, km)		Opening Distance (dl, km)		Opening Width (d^2, m)
			Sub-urban	In town	
Arteries	5	7	2.5	0.5	4
Collector	3	4	1.0	0.3	4

Source: Construction and Building Guidelines (2004) Department of Settlement and Regional Infrastructure.

Traffic Flow

Traffic flow is the number of motorized vehicles that pass the road and is measured in certain time intervals. Traffic volume is defined as the number of vehicles that passing a point on the highway for a unit of time.

The objectives of determining traffic volume include:

1. Determination of traffic flow on a road.
2. The tendency of road use.
3. Distribution of traffic on a road system.

In general, the traffic volume unit uses the Average Daily Traffic (abbreviated LHR).

Table 4. Emp Value for Divided and One-Way Urban Roads

Road Type: One-way Street and divided road	Traffic Flow per lane (Vehicles/hour)	Emp	
		HV	MC
Two Lane One Way (2/1)	0	1.3	0.40
Four Lane One Way (4/2D)	≥ 1050	1.2	0.25
Three Lane One Way (3/1)	0	1.3	0.40
Six-lanes divided (6/2D)	≥ 1100	1.2	0.25

Source: Indonesian Highway Capacity Manual (1997)

Vehicle Characteristics

Table 5. Description Of Passenger Car Unit (abbreviated PCU) Value

Transportation Type	Passenger Car Unit Value (pcu/hour)
Heavy vehicle (HV)	1.3
Light Vehicle (LV)	1.0
Motorcycle (MC)	0.5

Source: Indonesian Highway Capacity Manual (1997)

Capacity

Table 6. Base Capacity (Co) For Urban Road

No.	Road Type	Basic Capacity (pcu/hour)	Note
1.	Four lanes divided or one way	1650	per lane
2.	Four-lane undivided	1500	per lane
3.	Two-lane undivided	2900	two-way total

Source: Indonesian Highway Capacity Manual 1997

Table 7. FCw Adjustment for the Effect of Traffic Lane Width on Urban Roads

Nb.	**Road Type**	**Effective traffic lane width (Wc) (M)**	**FWC**
1.	Four-lanes divided or one-way street	Per Lane	
		3,00	0,92
		3,25	0,96
		3,50	1,00
		3,75	1,04
		4,00	1,08
2.	Four-lanes undivided	Per Lane	
		3,00	0,91
		3,25	0,95
		3,50	1,00
		3,75	1,05
		4,00	1,09
3.	Two-lanes undivided	Per Lane	
		5	0,56
		6	0,87
		7	1
		8	1,14
		9	1,25
		10	1,29
		11	1,34

Source: Indonesian Highway Capacity Manual 1997

Table 8. FCsp Capacity adjustment factor for directional separator

Direction Separator SP %-%		50-50	60-40	70-30	80-20	90-10	100-0
FCsp	Two-lanes 2/2	1.00	0.94	0.88	0.81	0.76	0.76
	Four-lanes 4/2	1.00	0.97	0.94	0.91	0.88	0.85

Source: Indonesian Highway Capacity Manual 1997

Table 9. FCsf Adjustment Factor for the Effect of Side Friction and Curb-Friction Distance on Urban Road and Shoulder Capacity

Nb.	Road Type	Side Friction Class (SFC)	Adjustment factor for side friction and curb-barrier distance (Wk)			
			Curb-friction distance Wk (m)			
			<0,5 M	1,0 M	1,5 M	>2M
1.	Four-lanes divided (4/2 D)	Very low	0,95	0,97	0,99	01
		Low	0,94	0,96	0,98	1,00
		Moderate	0,91	0,93	0,95	0,98
		High	0,86	0,89	0,92	0,95
		Very high	0,81	0,85	0,88	0,92
2.	Four-lanes undivided (4/2 UD)	Very low	0,95	0,97	0,99	1,01
		Low	0,93	0,95	0,97	1,00
		Moderate	0,90	0,92	0,95	0,97
		High	0,84	0,87	0,90	0,93
		Very high	0,77	0,81	0,85	0,90
3.	Two-lanes undivided (2/2 UD) or one way street	Very low	0,93	0,95	0,97	0,99
		Low	0,90	0,92	0,95	0,97
		Moderate	0,86	0,88	0,91	0,94
		High	0,78	0,81	0,84	0,88
		Very high	0,68	0,72	0,77	0,82

(Source: Indonesian Highway Capacity Manual 1997)

Table 10. FCcs Adjustment Factor for the Effect of City Size on Urban Road Capacity

Nb.	City Size (Million Population)	Adjustment Factor for city size FCcs
1.	<0.1	0.86
2.	0.1-0.5	0.90
3.	0.5-1.0	0.94
4.	1.0-3.0	1.00
5.	>3.0	1.04

(Source: Indonesian Highway Capacity Manual 1997)

Speed

According to Hobbs (1995), speed is the main parameter to describe traffic flow and travel speed recognized in kilometers per hour (km/hour).

Degree of Saturation

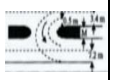
The degree of saturation (DS) is the ratio of road flow to capacity as the main factor in determining the performance level of intersections and road segments. The DS value indicates whether the road segment has a capacity problem or not.

U-Turn

In general, the U-turn condition is used for the rotation of the vehicle. However, there are U-turns that are prohibited from being used, for example there are traffic signs with assistive tools such as chain iron stakes. It can be found on the freeway. The U-turn

function is only for officers or during an emergency. According to the type of movement, U-Turn is divided into 3 types, namely single U-turn, double U-turn, and multiple U-turns.

Table 11. Minimum Width of Median Opening Design For U-Turn

Movement type		Minimum Median Opening Width (m) For Design Vehicles				
		P	WB-40	SU	BUS	WB-50
		Design Vehicle Length				
		5.7	15	9	12	16.5
Inside lane into outside lane		9	18	19	19	21
Inside lane into outside lane		6	15	15	16	18
Inside lane into outside lane		2	12	12	12	15

Side Friction

According to the 1997 Indonesian Highway Capacity Manual (abbreviated MKJI), side friction is the impact of side activities on the road segment on traffic roads, such as:

1. Pedestrians who walk or cross along a road segment.
2. Public transport and other vehicles that stop and park.
3. Motorized vehicles in and out of/to the land side/side of the road.
4. Slow moving traffic.

Table 12. FCsf Adjustment Factor for the Effect of Side Friction and Shoulder Width on Urban Road and Shoulder Capacity

Nb.	Road Type	Side Friction Class (SFC)	Adjustment factor for side friction and shoulder width (FCsf)			
			Average effective shoulder width Ws (M)			
			<0,5M	1,0M	1,5 M	>2M
1.	Four-lanes divided (4/2 D)	Very low	0.96	0.98	1.01	1.03
		Low	0.94	0.97	1.00	1.02
		Moderate	0.92	0.95	0.98	1.00
		High	0.88	0.92	0.95	0.98
		Very high	0.84	0.88	0.92	0.96
2.	Four-lanes undivided (4/2 UD)	Very low	0.96	0.99	1.01	1.03
		Low	0.91	0.97	1.00	1.02
		Moderate	0.92	0.95	0.98	1.00
		High	0.87	0.91	0.94	0.98
		Very high	0.80	0.86	0.90	0.95
3.	Two-lanes undivided (2/2 UD) or one way street	Very low	0.94	0.96	0.99	1.01
		Low	0.92	0.94	0.97	1.00
		Moderate	0.89	0.92	0.95	0.98
		High	0.82	0.86	0.90	0.95
		Very high	0.73	0.79	0.85	0.91

Table 13. Side Friction Class and Shoulder Width on Urban Road Capacity with Shoulders

Occurrence weighted frequency	Symbol	Side Friction Class	
A	B	C	D
<50	Plantations/areas less developed, no activities	Very low	VL
50-100	Few settlements and low activities	Low	L
150-200	Countryside, settlement activities	Moderate	M
250-249	Countryside, some market activities	High	H
>350	Near cities, market/commercial activities	Very high	VH

(Source: Indonesian Highway Capacity Manual 1997)

Table 14. Occurrence weight for side friction

Pedestrian	Public transportation or other vehicles stop	Vehicle entering or exiting the road side	Slow vehicle
0.5	1.0	0.7	0.7

(Source: Indonesian Highway Capacity Manual 1997)

Road Service Level

The road service level is performance of roads or intersections size that is calculated based on the level of road users, speed, density, and obstacles that occur.

Table 15. Road service level characteristics

Service Level	Description	Degree of Saturation (DS)
A	Free flow conditions; low volume and speed	0.00-0.20
B	In the stable current zone. Speed slightly limited by traffic	0.20-0.44
C	In stable flow zone but speed controlled by traffic	0.45-0.74
D	Current Approaching unstable. Operation speed	0.75-0.854
E	Different - sometimes stops, volume	0.85-1.00
F	Low, volume below capacity, queue	>1.00

RESEARCH METHODS

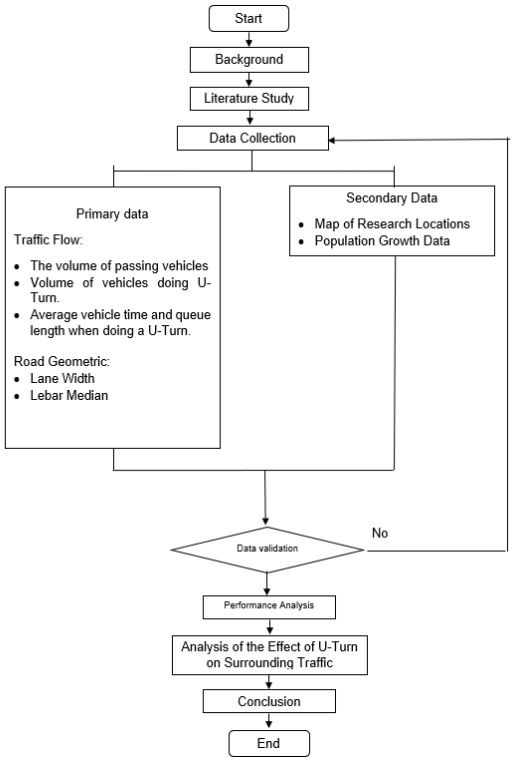


Figure 1. Research methodology stages

3. RESULTS AND DISCUSSION

Traffic Volume

The total observation time was 4 hours per day for three days per point. Observations were conducted at 07.00 - 09.00 WIB, and 16.00 - 18.00 WIB.

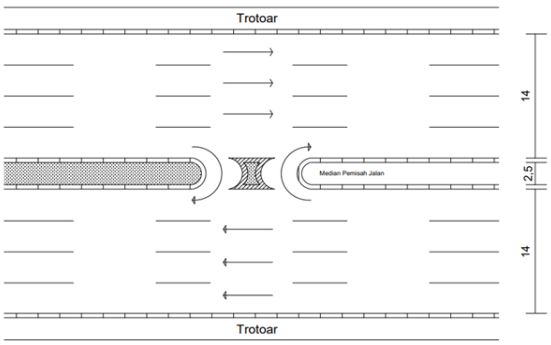


Figure 1. Geometric U-Turn Jl. General Basuki Rachmat

Table 16. Traffic Volume Data for Weekday I (vehicle/hour)

Time	Number of Vehicles (vehicles/hour) Jalan Jenderal Basuki Rachmat Street					
	East-West			West-East		
	MC	LV	HV	MC	LV	HV
Weekday I						
Morning						
07.00-08.00	4472	2922	97	2583	978	77
08.00-09.00	2896	1106	62	2821	1304	77
Afternoon						
16.00-17.00	3444	926	79	3803	1009	92
17.00-18.00	3424	1072	58	3828	1273	97

Source: Field survey

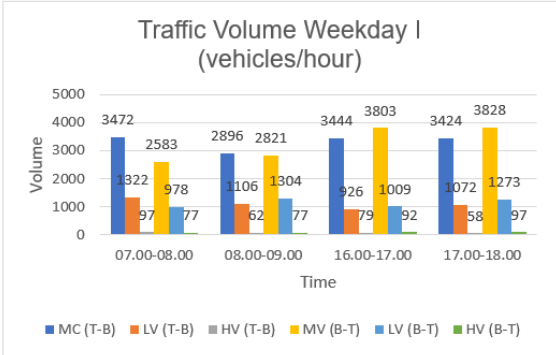


Figure 2. Traffic Volume Weekday I (vehicles/hour)

Table 17. Traffic Volume Data for Weekday II (vehicles/hour)

Time	Number of Vehicles (vehicles/hour) Jalan Jenderal Basuki Rachmat Street					
	East-West			West-East		
	MC	LV	HV	MC	LV	HV
Weekday II						
Morning						
07.00-08.00	2479	864	67	2398	1394	98
08.00-09.00	2882	1087	52	2562	878	93
Afternoon						
16.00-17.00	3292	800	89	3253	1334	106
17.00-18.00	3401	1023	92	3657	807	86

Source: Field survey

Table 18. Traffic Volume Data for Weekday III (vehicles/hour)

Time	Number of Vehicles (vehicles/hour) Jalan Jenderal Basuki Rachmat Street					
	East-West			West-East		
	MC	LV	HV	MC	LV	HV
Weekday III						
Morning						
07.00-08.00	2147	792	75	2173	1356	107
08.00-09.00	2474	1022	84	2367	923	86
Afternoon						
16.00-17.00	3135	958	77	3325	877	82
17.00-18.00	3337	1104	84	4918	2898	119

Source: Field survey

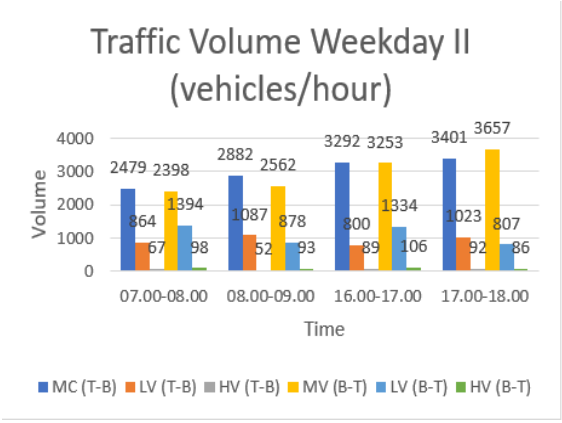


Figure 3. Traffic Volume Weekday II (vehicles/hour)

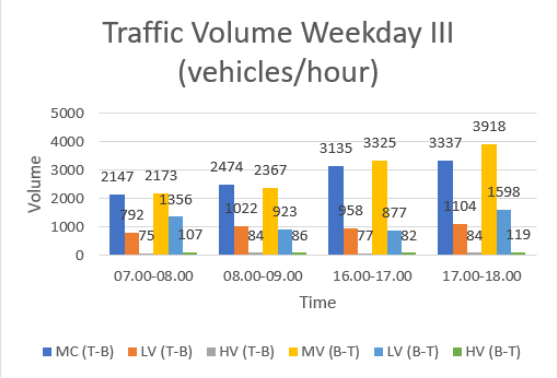


Figure 4. Traffic Volume Weekday III (vehicles/hour)

Table 19. Traffic Volume Data for Weekend (vehicles/hour)

Time	Number of Vehicles (vehicles/hour) Jalan Jenderal Basuki Rachmat Street					
	East-West			West-East		
	MC	LV	HV	MC	LV	HV
Weekend						
Morning						
07.00 - 08.00	2252	1267	71	2467	1543	62
08.00 - 09.00	2397	1284	76	2444	1359	70
Afternoon						
16.00-17.00	3357	1238	61	3182	1211	68
17.00-18.00	3389	1312	58	3202	1351	62

Source: Field survey

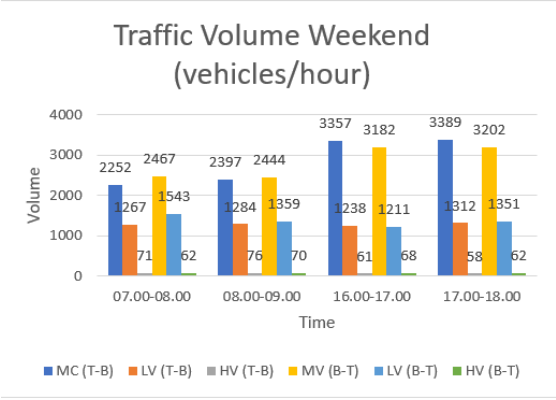


Figure 5. Traffic Volume Weekend (vehicles/hour)

Calculation of Vehicle Volume from vehicle/hour to smp/hour

1. Jenderal Basuki Rachmat Street

a. (West-East) Weekday I 08.00-09.00.

MC = (4472 x 0,5) = 1736 smp/hour

LV = (2922 x 1,0) = 1322 smp/hour

HV = (97 x 1,3) =126,1 smp/hour +

5284,1 smp/hour

b. (West-East) Weekday III 17.00-18.00.

MC =(4918 x 0,5) = 1959 smp/hour

LV =(2898 x 1,0) = 1598 smp/hour

HV = (119 x 1,3) =154,7 smp/hour +

5510,2 smp/hour

Traffic Volume Analysis

The highest traffic volume in the East-West direction on Jalan Jenderal Basuki Rachmat was 5284.1 pcu/hour and the West-East direction was 5510.2 pcu/hour. The peak hour volume in the East-West direction was the weekday I at 08.00-09.00, while the West-East direction was the weekday III at 17.00 - 18.00.

Road Capacity Data

The research location was a road segment which consisted of 4 lanes and 2 lanes.

Table 20. Geometric Data of Research Location

Research Location	Road Type	Road Width (m)	Median Width (m)	Side friction
Jl. Jendral Basuki Rachmat	4/2 D	14	2,5	High

Source: Field survey

Road Capacity Analysis

Table 21. Road Capacity Calculation

Research Location	Adjustment Factor				
	Co	Fcw	FCsp	FCsf	FCcs
Jl. Jendral Basuki Rachmat	1650	1,00	1,00	0,97	1,04

Source: Indonesian Highway Capacity Manual

Road Capacity Calculation

1. Jalan Jenderal Basuki Rachmat

Road sections 4/2 D obtained capacity per lane

C = Co x FCw x FCsp x FCsf x FCcs
= 1650 x 1.00 x 1.00 x 0.96 x 1.04
= 1647,36 smp/hour.

With 4 lanes, the capacity was:
C = 4 x 1664,52 = 6589,44 smp/hour.

Degree of Saturation

1. Jenderal Basuki Rachmat Street
    1. East-West

$$DS = \frac{Qsmp}{C} = \frac{5284,1}{6598,44} = 0,80$$

    2. West-East

$$DS = \frac{Qsmp}{C} = \frac{5510,2}{6598,44} = 0,83$$

Analysis of Vehicles Doing U-Turns

Table 22. Number of Vehicles Doing U-Turns from East to West

Time	Number of Vehicles (vehicles/hour)			Total vehicles that do U-turns
	MC	LV	HV	
Weekday I				
Morning				
07.00-08.00	1167	755	27	1949
08.00-09.00	638	365	44	1047
Afternoon				
16.00-17.00	518	297	38	853
17.00-18.00	623	375	47	1045
Weekday II				
Morning				
07.00-08.00	428	261	43	732
08.00-09.00	709	359	29	1097
Afternoon				
16.00-17.00	496	256	38	790
17.00-18.00	637	393	27	1057
Weekday III				
Morning				
07.00-08.00	399	307	29	735
08.00-09.00	707	338	38	1083
Afternoon				
16.00-17.00	583	307	25	915
17.00-18.00	599	387	37	1023
Weekend				
Morning				
07.00-08.00	378	352	21	751
08.00-09.00	688	251	32	971
Afternoon				
16.00-17.00	594	301	28	923
17.00-18.00	596	392	33	1021

Source: Field survey

Vehicles that did the most U-turns from the East - West were on the weekday I at 08.00-09.00, namely 1949 vehicles.

Table 23. Number of Vehicles Doing U-Turns from West to East

Time	Number of Vehicles (vehicles/hour)			Total vehicles that do U-turns
	MC	LV	HV	
Weekday I				
Morning				
07.00-08.00	681	304	28	1013
08.00-09.00	898	431	40	1369
Afternoon				
16.00-17.00	705	323	43	1071
17.00-18.00	885	446	28	1359
Weekday II				
Morning				
07.00-08.00	744	433	34	1211
08.00-09.00	747	290	31	1068
Afternoon				
16.00-17.00	641	427	17	1085
17.00-18.00	895	178	37	1110
Weekday III				
Morning				
07.00-08.00	730	421	27	1178
08.00-09.00	716	305	36	1057
Afternoon				
16.00-17.00	789	288	27	1104
17.00-18.00	1039	910	47	1996
Weekend				
Morning				
07.00-08.00	582	559	19	1160
08.00-09.00	738	632	25	1395
Afternoon				
16.00-17.00	590	463	24	1077
17.00-18.00	668	397	23	1088

Source: Field survey

Vehicles that did the most U-turns from the West - East were the weekday III at 17.00-18.00, namely 1996 vehicles.

Analysis of the Average Travel Time of Vehicles When Doing a U-turn

Table 24. Average Travel Time of Vehicles Doing U-Turns

Time	Average vehicle travel time (seconds)			
	East-West			
	07.00-08.00	08.00-09.00	16.00-17.00	17.00-18.00
Weekday I	8,1	12,6	9,3	11,2
Weekday II	7,1	12	11,2	7,7
Weekday III	7,9	11,4	11,3	7,8
Weekend	7,7	10,8	11,2	7,5
Time	West-East			
	07.00-08.00	08.00-09.00	16.00-17.00	17.00-18.00
Weekday I	11,3	14,9	11,7	14,7
Weekday II	12,4	12,4	10,6	14,9
Weekday III	12,1	11,9	13,1	15,3
Weekend	12,2	11	10,8	14,5

Source: Field survey

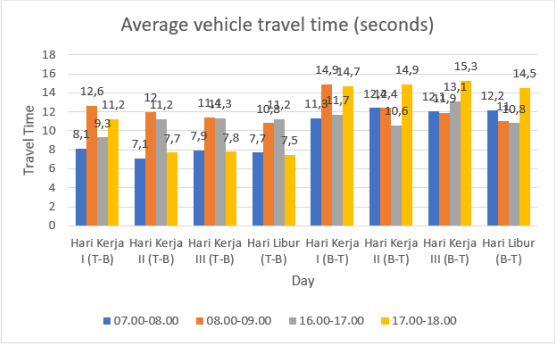


Figure 6. Average vehicle travel time (seconds) from East-West and West-East directions

The highest average travel time of vehicle turning on Jenderal Basuki Rachmat road from the East - West direction was 12.6 seconds on the weekday I at 08.00-09.00, while from the West - East direction was 15.3 on the weekday III at 17.00- 18.00.

Vehicle Speed When U-Turn

1. Jenderal Basuki Rachmat Street (East-West)

   Length = 45 meter = 0.045 km

   Time = 12,6 second = 0,0035 hour

   $$\text{Speed} = \frac{0{,}045}{0{,}0035} = 12{,}8 \text{ Km/hour}$$

2. Jenderal Basuki Rachmat Street (West-East)

   Length = 45 meter = 0.045 km

   Time = 15,3 second = 0,00425 hour

   $$\text{Speed} = \frac{0{,}045}{0{,}00425} = 10{,}5 \text{ Km/hour}$$

Vehicle Speed Analysis

The observations results revealed that the largest number of U-turn vehicles with 1-hour intervals was from the East - West direction on the weekday I at 08.00-09.00 namely 1949 vehicles, while from the West - East direction on the weekday III at 17.00-18.00, namely 1996 vehicles. The number of vehicles that did U-turns and the average maneuvering speed of vehicles that were less than 15 km/hour caused queues and affected the speed of vehicles on the Jenderal Basuki Rachmat road.

Vehicle Queue Length When U-Turn

Table 25. Vehicle Queue Length When U-Turn

Time	Queue Length When Doing U-turn (Meter)			
	East-West			
	07.00 - 08.00	08.00 - 09.00	16.00 - 17.00	17.00 - 18.00
Weekday I	25	11	17	14
Weekday II	16	13	10	15
Weekday III	14	10	11	12
Weekend	6	9	10	10
West-East				
Weekday I	8	12	14	20
Weekday II	7	13	16	19
Weekday III	6	10	18	50
Weekend	8	10	15	17

Source: Field survey

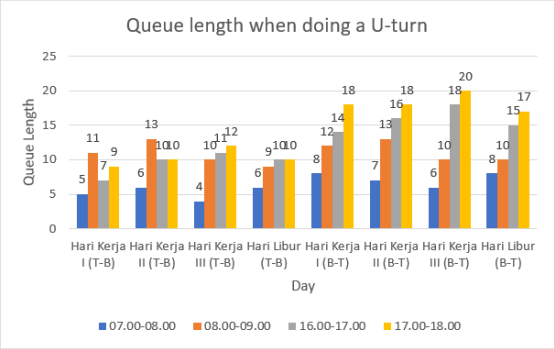


Figure 7. Queue length when doing U-turns from East-West and West-East directions

The highest queue length for vehicles in the East-West direction was the weekday I of 25 meters, while in the West-East direction was the weekday III of 50 meters which was classified as severe queue conditions.

Road Service Level Using Ratio V/C

Table 26. Road Service Level

Nb.	Location	Volume (V) (smp/hour)	Capacity (C) (smp/hour)	V/C	Service Level
1	Jalan Jenderal Basuki Rachmat	5510,2	6589,44	0,83	D

U-turn analysis

The observations results showed that the data on the number of vehicles doing U-turns on Jenderal Basuki Rachmat street. The highest number of vehicles doing U-turns could be seen in tables 4.7 and 4.8. At intervals of 1 hour, in the East - West direction the highest number was the weekday I at 08.00-09.00, namely 1949 vehicles, while in the West - East direction was the weekday III at 17.00-18.00, namely 1996 vehicles. The number of vehicles that did U-turns and the average maneuvering speed of vehicles that were less than 15 km/hour caused queues and affected the speed of vehicles on the Jenderal Basuki Rachmat street. The highest vehicle queue length could be seen in table 4.10, which was 50 meters in the West-East direction at 17.00-18.00. Based on the analysis of the effect of the U-turn on the Jendral Basuki Rachmat street characteristics, the authorities should improve traffic management.

4. CONCLUSION

Based on the data analysis results, several conclusions are obtained, including:

1. The U-turn facility on Jendral Basuki Rachmat street affects the traffic flow characteristics. Vehicles that do U-turns at 07.00 and 18.00 as rush hour and high side friction create queues and affect vehicle speed on Jenderal Basuki Rachmat street. The characteristics of traffic flow on Jenderal Basuki Rachmat street are level D with a v/c value of 0.83.
2. The highest number of vehicles using the U-turn facility on Jendral Basuki Rachmat street from the East-West direction is 1949 vehicles per hour, while from the West-East direction is 1996 vehicles per hour.
3. The highest average vehicle travel time when doing a U-turn on Jalan Jendral Basuki Rachmat from the East-West direction is 12.6 seconds, while from the West-East direction it is 15.3 seconds.
4. The highest vehicle queue length when doing a U-turn in the East-West direction is 25 meters, while the West-East direction is 50 meters.

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