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ANALYSIS IMPACT OF TRAFFIC (ANDALALIN) KAWASAN MALL TRANSMART OF TAJUR ROAD BOGOR

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ABSTRACT

East Bogor District has 6 Village Office with an area of 10.15km2. The increase in population growth and development in the area has also increased the movement of traffic flow into and out of the area, causing several problems especially in reducing the performance of road sections that cause traffic congestion on road sections. This study aims to create a model of the generation and attraction generated by land uses such as the Education Building, Industrial Estate, Traditional Markets and Supermarkets. Located in the district. Data processing is carried out with the calculation method of transportation analysis using MKJI 2017. Then it uses (Trip Generation Manual) and then modeled in (Saturn Software). The number of Stitches and Pulls in the area studied was found to be 91.82 trips / hour. With the level of road services with a range of C to F. Then the design equation of transportation modeling for East Bogor sub-district in 2019 is Y = 11,790 + 1,098 (X) then in 2025, Y = 2963.66 + 0.840 (X). This proves that if there is no improvement and improvement of road network infrastructure, and efforts to procure an adequate road-based mass public transport system, it will add to the decline in performance of road segments in the region in the future.

Key word: trip generation; trip attraction;MAT; ANDALALIN; transportation.

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INTRODUCTION

The development of a certain area has an influence on the traffic around it. This occurs due to changes in land use which result in the movement of traffic flow in and out of the location so that it will affect the pattern of transportation services in the area concerned. With the construction of new apartments, it is estimated that it will generate traffic generation and affect traffic around the new activity center. Through the traffic impact evaluation, it can be calculated how much the new trip generation will require traffic engineering and traffic management to overcome the impact. Traffic impact evaluation is used to predict whether the transportation infrastructure is capable of serving existing (existing) traffic coupled with traffic generated or attracted by new activity centers. If the existing infrastructure cannot support the traffic, a study on the handling of the infrastructure and traffic management arrangements must be carried out (Prasetyo WH, Murtejo T, 2018; Sukirman S, 1999; Tamim OZ, 2000).

The construction of the Tajur Bogor Transmart Mall owned by PT. Dinamika Perkasa Mandiri, which is located on Jl. Raya Tajur No.25, Tajur, Bogor Timur, Bogor City. This Transmart is predicted to be the largest Transmart in Indonesia which is equipped with additional facilities in the form of a Theme Park, Mini Trans Studio, Restaurant and Café, and Cinema. This of course will lead to changes in traffic characteristics in the form of trip generation and attraction as well as changes in other characteristics. In response to this, it is necessary to carry out a traffic impact analysis in order to predict the possible magnitude of the resulting impact and to anticipate the impact of the construction of the Mall Transmart Building on the surrounding traffic.

In Law Number 22 of 2009 concerning Road Transportation Traffic, traffic management and engineering constitute a series of businesses and activities which include planning, procurement, installation, regulation and maintenance of road equipment facilities in the context of realizing, supporting and maintaining security, order, and smooth traffic.

According to the Regulation of the Minister of Transportation of the Republic of Indonesia Number PM 75 of 2015 concerning the Implementation of Traffic Impact Analysis that any plans

for development and/or development of activity centers, settlements and infrastructure that will cause disturbances to security, safety, order and smoothness of traffic and road transportation must be carried out. Traffic Impact Analysis. Based on these thoughts, Mall Transmart will have a negative impact on road performance and intersection performance, so it is necessary to conduct a study in order to anticipate the possibility of decreasing the LOS performance of the road network. So that the construction of a new building or area, a Traffic Impact Analysis study must be carried out so that the performance conditions of the surrounding road network are not disturbed (Niatika U, 2018; Oglesby C, et.al. 1996).

Dwi AP, Murtejo T (2017) said the impact on changes in traffic patterns at each intersection affected the basic concept of traffic. so that it is possible to change the flow and volume of traffic in increasing the burden of the road being passed. The impact of this traffic will increase if this condition is not regulated by traffic engineering.

The function of the road is very important in transportation. The road will increase its carrying capacity if the vehicle that is burdening the road passes often stops. Motor vehicles are the highest contributor to the increasing road load. It is hoped that with the increasing number of vehicles, the driver's compliance with traffic signs will also be higher. The hope is that people will be aware of good traffic conditions. This condition will support good and planned traffic management. Awareness of road users in overcoming congestion at a certain point will affect the interests of fellow road users in using existing transportation infrastructure (Gunawan A, 2015; Syaiful S, et.al 2022; Akbar IS, 2021; Nina Z, 2021; Sarwono D, 2015).

Syaiful S (2017) said that in carrying out its function, a road will connect one another so that a node will be formed. This node will receive special treatment as a form of road priority in supporting the smooth flow of traffic so that it will generate new directions in the governance of existing traffic lanes.

To support the function of a good road, it must be managed properly, so that if there is a gap in the regulation of the road pattern, the cause will be quickly identified. The right solution in this management lies with the Road Transport Traffic Service. This related agency will evaluate any new flow-making activities to avoid congestion in the future (Syaiful S, Hariyadi D, 2019; Syaiful S, et al, 2021).

Generation and attraction

Awakening is the number of movements originating from a land use (zone) while attraction is the amount of movement towards a zone.

Movement generation is a modeling stage that estimates the amount of movement originating from a zone or land use and the amount of movement attracted to a land use or other zone. Traffic movement is a land use function that produces traffic movements. This traffic generation includes:

1. Traffic leaving a location
2. Traffic to or from a location

The output from the calculation of traffic generation and attraction is the number of vehicles, people, or goods per unit of time, for example vehicles/hour. We can easily count the number of people or vehicles entering or leaving a certain area of land in one day (or one hour) to get the generation and attraction of the movement.

The spread of movement

The aim of moving within an area will cause problems such as congestion, air pollution, noise, delays and so on. One way to be able to find solutions to these problems is to understand the current and future movement patterns.

Understanding patterns can be identified by searching data about the origin and destination of movements, the magnitude of the movements, and when the movements occur.

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MAT/Origin Destination Matrix

MAT is a matrix of origin and destination which contains information about the magnitude of movement between zones within a certain area. In this case, the Tid notation states the amount of movement flow (vehicles, passengers, and goods) moving from origin zone i to destination zone d during a certain time interval (Prasetyo WH, Murtejo T, 2018; MKJI. 2017).

Almost all techniques and methods of solving transportation problems (both urban and regional) require MAT information as basic information and foremost in representing the need for movement.

Public Transportation Problems

During peak hours of peak overcrowding is a common thing in Bogor Regency, especially in areas in the activity centers. These conditions, namely very congested vehicles and irregular schedules, cause passengers to experience delays in their travels, immaterial losses and others.

During the off-peak hour period, services will run irregularly, so that the level of public trust in public transportation decreases, which in turn causes them to switch to using private vehicles to fulfill their mobility. As a result, we can predict that the level of congestion is getting higher, which in turn causes the level of public transport services to decline.

RESEARCH METHODS

Time and Place of Research

At this stage the researcher made direct observations in the East Bogor District. by conducting a direct survey on roads in the research location area.

Place of execution

The research location is on the Arterial and Collector roads, and also at the Education Building, Industrial Area, Hospital, Traditional Market and Supermarket. Existing in this research area.

Figure 1. Study Locations (Source: Google Maps/Earth analysis)

Research time

The research was conducted on May 11, 12 and 13, 2019. The research time was only conducted at the peak hours or the peak hours, which was seen from the daily traffic habits on the Google maps application.

While the implementation is carried out for 3 days, namely Monday which is a work day and study day, and also on Saturdays and Sundays which are weekends.

Materials and tools

Material

The materials needed in this study are primary and secondary data obtained from the analysis and related agencies in the form of Bogor City growth data, Bogor City existing conditions, and Bogor City Spatial Planning Map data (RTRW Kota Bogor).

Tools

1. The tools needed consist of:
2. Traffic Counting questionnaire form
3. Stationery, Road Board, Meter
4. Counting tool,
5. Mobile as a tool for documentation and communication
6. Computers for data processing, and printers, A4 paper as a print out of planning results and reports.

How it Works

The way this research works is described based on the stages that have been designed in the research flow diagram shown in Figure 2 below.

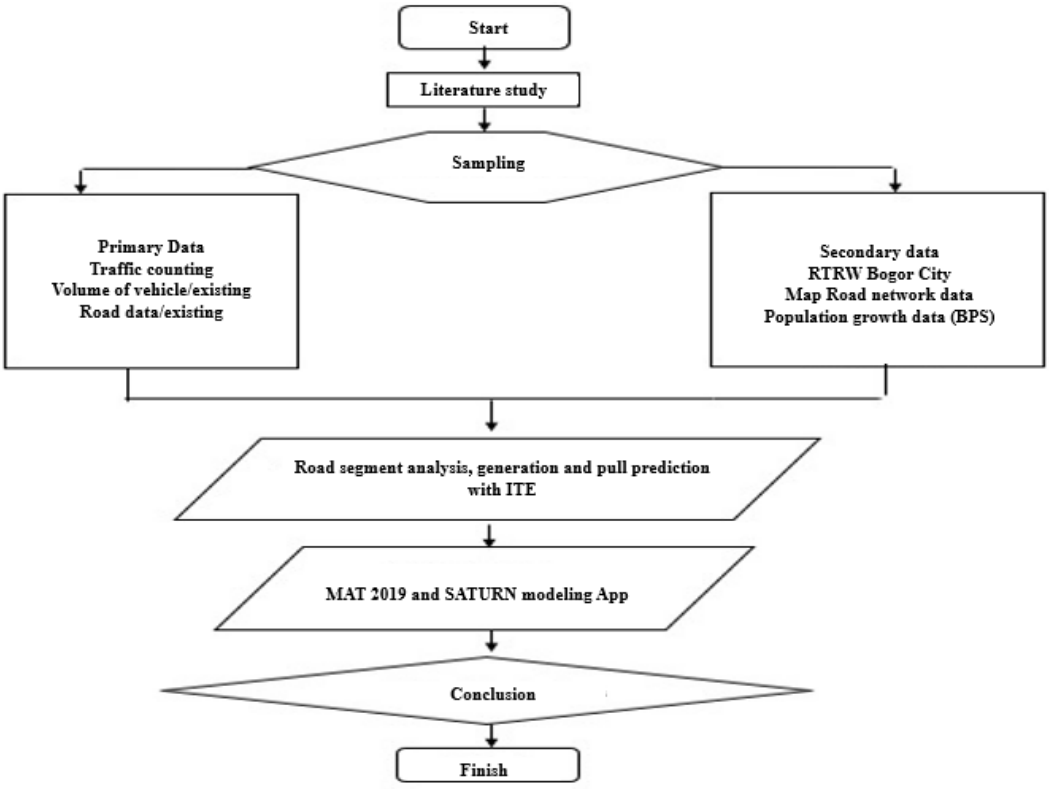

Figure 2. Flow Chart (Source: Analysis Results)

RESULTS AND DISCUSSION

Existing Conditions

Figure 3. Location of Traffic Counting and Generation Prediction (Source: Google Earth, 2019)

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Table 1 Inventory of Roads

No	Road name	Type	Road body width (m)	Road function
1	Raya Tajur 1 Road	2/2TT	6	Arteries
2	Raya Tajur 2 Road	2/2TT	6	Arteries
3	Raya Pajajaran 1 Road	4/2T	12	Arteries
4	Raya Pajajaran 2 Road	4/2T	12	Arteries
5	Raya Sukasari Road	4/2TT	6.5	Collector
6	Raya Lawanggintung Road	4/2TT	6	Collector

(Source: Analysis Results)

Traffic Counting Data Calculation

Table 2. Flow of Vehicle Volume by Urban Road Classification at Jln. Raya Tajur 1

No	Raya Tajur 1 Road	West	Road type 2/2TT	Road type 2/2TT	SMP/Hours	Amount
	Period	SM	KR	KB		
1	06.00 – 07.00	652	642	14	1.308	3.260
2	07.00 – 08.00	444	613	8	1.065	2.395
3	11.00 – 12.00	413	558	6	977	2.216
4	12.00 – 13.00	660	722	23	1.404	3.379
5	16.00 – 17.00	469	439	10	917	2.322
6	17.00 – 18.00	376	389	12	777	1.901

(Source: Analysis Results)

Table 3. Flow of Vehicle Volume by Urban Road Classification at Jln. Raya Tajur 2

No	Raya Tajur 2 Road	EAST	Road type 2/2TT	Road type 2/2TT	SMP/Hours	Amount
	Period	SM	KR	KB		
1	06.00 – 07.00	343	882	14	1.240	2.267
2	07.00 – 08.00	364	720	10	1.093	2.182
3	11.00 – 12.00	375	558	10	973	2.098
4	12.00 – 13.00	482	908	19	1.409	2.851
5	16.00 – 17.00	404	929	4	1.337	2.549
6	17.00 – 18.00	347	625	6	978	2.016

(Source: Analysis Results)

Table 4. Vehicle Volume Flow with Urban Road Classification at Jln. Raya Padjajaran 1

No	Raya Pajajaran 1 Road	EAST	Road type 4/2T	Road type 4/2T	SMP/Hours	Amount
	Period	SM	KR	KB		
1	06.00 – 07.00	690	1.092	11	1.793	3.862
2	07.00 – 08.00	661	994	11	1.666	3.648
3	11.00 – 12.00	691	1.016	7	1.714	3.784
4	12.00 – 13.00	811	1.242	24	2.077	4.504
5	16.00 – 17.00	659	1.025	10	1.694	3.669
6	17.00 – 18.00	632	920	10	1.561	3.454

(Source: Analysis Results)

Table 5. Flow of Vehicle Volume by Urban Road Classification at Jln. Raya Padjajaran 2

No	Raya Pajajaran 2 Road	EAST	Road type 4/2T	Road type 4/2T	SMP/Hours	Amount
	Period	SM	KR	KB		

1	06.00 – 07.00	530	1.321	8	1.859	3.447
2	07.00 – 08.00	558	1.355	6	1.919	3.590
3	11.00 – 12.00	521	1.426	6	1.953	3.515
4	12.00 – 13.00	690	1.460	20	2.170	4.236
5	16.00 – 17.00	585	1.333	4	1.922	3.677
6	17.00 – 18.00	537	1.321	10	1.867	3.436

(Source: Analysis Results)

Table 6 Flow of Vehicle Volume by Urban Road Classification at Jln. Sukasari

No	Raya Sukasari Road	EAST	Road type 4/2TT	Road type 4/2TT	SMP/Hours	Amount
	Period	SM	KR	KB		
1	06.00 – 07.00	320	389	4	712	1.671
2	07.00 – 08.00	286	355	5	645	1.501
3	11.00 – 12.00	300	273	2	575	2.110
4	12.00 – 13.00	397	515	10	921	4.504
5	16.00 – 17.00	291	405	4	699	1.570
6	17.00 – 18.00	262	366	4	631	1.415

(Source: Analysis Results)

Table 7. Flow of Vehicle Volume by Urban Road Classification at Jln. Lawanggintung

No	Raya Lawanggintung Road	EAST	Road type 4/2TT	Road type 4/2TT	SMP/Hours	Amount
	Period	SM	KR	KB		
1	06.00 – 07.00	324	467	4	795	1.766
2	07.00 – 08.00	318	587	2	907	1.860
3	11.00 – 12.00	306	493	6	805	1.720
4	12.00 – 13.00	375	707	11	1.093	2.217
5	16.00 – 17.00	333	794	7	1.134	2.130
6	17.00 – 18.00	328	704	8	1.040	2.022

(Source: Analysis Results)

Calculation of Average Speed of Roads

VB = (VBD + VBL). FVBHS. FVBUK

Table 8. Average Speed of Urban Road Classification Section

No	Road name	VBD km/hours	VBL km/hours	FVBHS LBe (m)	FVBUK	VB
1	Raya Tajur 1 Road	55	-4	0.95	1.00	48.45
2	Raya Tajur 2 Road	55	-4	0.95	1.00	48.45
3	Raya Pajajaran 1 Road	55	0	0.95	1.00	52.25
4	Raya Pajajaran 2 Road	55	0	0.95	1.00	52.25
5	Raya Sukasari Road	55	7	0.95	1.00	58.90
6	Raya Lawanggintung Road	55	7	0.95	1.00	58.90

(Source: Survey Results and Analysis)

VB = (VBD + FVB-W). FVB-HS.FVB-FJ

Road Section Capacity Calculation

The calculation of road capacity based on the MKJI 2017 is stated in the following table:

C = C0 x FCLj x FCPA x FCHS x FCUK

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Table 9. Urban Road Capacity

No	Road name	C_o	FC_{Lj}	FC_{PA}	FC_{HS}	FC_{UK}	FC_{UK}	C
1	Raya Tajur 1 Road	1650	3300	0.92	1.00	0.98	1.00	2.975
2	Raya Tajur 2 Road	1650	3300	0.92	1.00	0.98	1.00	2.975
3	Raya Pajajaran 1 Road	1650	3300	1.00	1.00	0.95	1.00	3.135
4	Raya Pajajaran 2 Road	1650	3300	1.00	1.00	0.95	1.00	3.135
5	Raya Sukasari Road	2900	5800	0.87	1.00	0.94	1.00	4.743
6	Raya Lawanggintung Road	2900	5800	0.87	1.00	0.94	1.00	4.743

(Source: Survey Results and Analysis)

C = C0 x FCLJ x FCPA x FCHS

Service Level (Existing)

Table 10. Road Traffic Service Levels in East Bogor Distric

No	Road name	Type	To	Road body width (m)	C	V	VCR	LOS
1	Raya Tajur 1 Road	2/2TT	Raya Pajajaran	6	2.975	1404.3	0.47	C
2	Raya Tajur 2 Road	2/2TT	Raya Pajajaran	6	2.975	1408.95	0.47	C
3	Raya Pajajaran 1 Road	4/2T	Raya Tajur	12	3.135	2076.5	0.66	C
4	Raya Pajajaran 2 Road	4/2T	Raya Sukasari	12	3.135	2170.15	0.69	C
5	Raya Sukasari Road	4/2TT	Raya Tajur	6.5	4.743	921.35	0.19	A
6	Raya Lawanggintung Road	4/2TT	Raya Pajajaran	6	4.743	1133.7	0.24	B

(Source: Analysis Results, 2019)

Table 11. Road Traffic Service Levels in East Bogor District in 2019 and 2025

No	Road name	Type	VCR (2019)	LOS	VCR (2025)	LOS
1	Raya Tajur 1 Road	2/2TT	0.47	C	0.50	C
2	Raya Tajur 2 Road	2/2TT	0.47	C	0.50	C
3	Raya Pajajaran 1 Road	4/2T	0.66	C	0.70	C
4	Raya Pajajaran 2 Road	4/2T	0.69	C	0.73	C
5	Raya Sukasari Road	4/2TT	0.19	A	0.21	B
6	Raya Lawanggintung Road	4/2TT	0.24	B	0.24	B

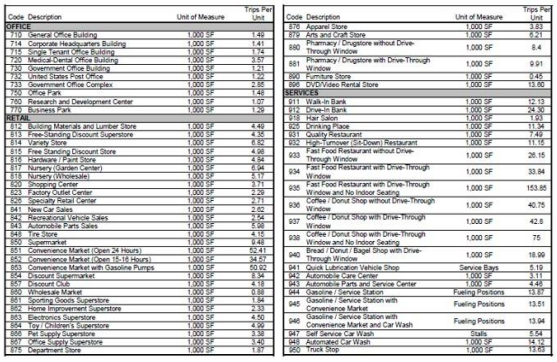
(Source: Analysis Results, 2019)

Prediction of Generation Calculation Using ITE (Institute Transportation Engineers)

(Trip Generation Manual, 9th Edition)

Code	Description	Unit of Measure	Trips Per Unit
PORT AND TERMINAL			
30	Truck Terminal	Acres	6.55
90	Park and Ride Lot with Bus Service	Parking Spaces	0.62
INDUSTRIAL			
110	General Light Industrial	1,000 SF	0.97
120	General Heavy Industrial	Acres	2.16
130	Industrial Park	1,000 SF	0.85
140	Manufacturing	1,000 SF	0.73
150	Warehousing	1,000 SF	0.32
151	Mini-Warehouse	1,000 SF	0.26
152	High-Cube Warehouse	1,000 SF	0.12
170	Utilities	1,000 SF	0.76
RESIDENTIAL			
210	Single-Family Detached Housing	Dwelling Units	1.00
220	Apartment	Dwelling Units	0.62
221	Low-Rise Apartment	Dwelling Units	0.58
230	Residential Condominium / Townhouse	Dwelling Units	0.52
240	Mobile Home Park	Dwelling Units	0.59
251	Senior Adult Housing - Detached	Dwelling Units	0.27
252	Senior Adult Housing - Attached	Dwelling Units	0.25
253	Congregate Care Facility	Dwelling Units	0.17
254	Assisted Living	Beds	0.22
255	Continuing Care Retirement Community	Dwelling Units	0.16
LODGING			
310	Hotel	Rooms	0.60
320	Motel	Rooms	0.47
330	Resort Hotel	Rooms	0.42
RECREATIONAL			
411	City Park	Acres	0.19
412	County Park	Acres	0.09
413	State Park	Acres	0.07
415	Beach Park	Acres	1.30
416	Campground / Recreation Vehicle Park	Camp Sites	0.27
417	Regional Park	Acres	0.20
420	Marina	Berths	0.19
430	Golf Course	Acres	0.30
431	Miniature Golf Course	Holes	0.33

Code	Description	Unit of Measure	Trips Per Unit
432	Golf Driving Range	Tees / Driving Positions	1.25
433	Batting Cages	Cages	2.22
435	Multi-Purpose Recreational Facility	Acres	5.77
437	Bowling Alley	1,000 SF	1.71
441	Live Theater	Seats	0.02
443	Movie Theater without Matinee	1,000 SF	6.16
444	Movie Theater with Matinee	1,000 SF	3.80
445	Multiplex Movie Theater	1,000 SF	4.91
452	Horse Race Track	Acres	4.30
454	Dog Race Track	Attendance Capacity	0.15
460	Arena	Acres	3.33
473	Casino / Video Lottery Establishment	1,000 SF	13.43
480	Amusement Park	Acres	3.95
488	Soccer Complex	Fields	17.70
490	Tennis Courts	Courts	3.88
491	Racquet / Tennis Club	Courts	3.35
492	Health / Fitness Club	1,000 SF	3.53
493	Athletic Club	1,000 SF	5.96
495	Recreational Community Center	1,000 SF	1.45
INSTITUTIONAL			
520	Elementary School	1,000 SF	1.21
522	Middle School / Junior High School	1,000 SF	1.19
530	High School	1,000 SF	0.97
536	Private School (K-12)	Students	0.17
540	Junior / Community College	1,000 SF	2.54
560	Church	1,000 SF	0.55
565	Daycare Center	1,000 SF	12.46
566	Cemetery	Acres	0.84
571	Prison	1,000 SF	2.91
580	Museum	1,000 SF	0.18
590	Library	1,000 SF	7.30
591	Lodge / Fraternal Organization	Members	0.03
MEDICAL			
610	Hospital	1,000 SF	0.93
620	Nursing Home	1,000 SF	0.74
630	Clinic	1,000 SF	5.18
640	Animal Hospital / Veterinary Clinic	1,000 SF	4.72



Code	Description	Unit of Measure	Trips Per Unit
OFFICE			
710	General Office Building	1,000 SF	1.49
714	Corporate Headquarters Building	1,000 SF	1.41
715	Single Tenant Office Building	1,000 SF	1.74
720	Medical-Dental Office Building	1,000 SF	3.57
730	Government Office Building	1,000 SF	1.21
732	United States Post Office	1,000 SF	1.22
733	Government Office Complex	1,000 SF	2.95
750	Office Park	1,000 SF	1.48
760	Research and Development Center	1,000 SF	1.07
770	Business Park	1,000 SF	1.29
RETAIL			
812	Building Materials and Lumber Store	1,000 SF	4.49
813	Free-Standing Discount Superstore	1,000 SF	4.35
814	Variety Store	1,000 SF	6.82
815	Free Standing Discount Store	1,000 SF	4.98
816	Hardware / Paint Store	1,000 SF	4.84
817	Nursery (Garden Center)	1,000 SF	6.94
818	Nursery (Wholesale)	1,000 SF	5.17
820	Shopping Center	1,000 SF	3.71
823	Factory Outlet Center	1,000 SF	2.29
826	Specialty Retail Center	1,000 SF	2.71
841	New Car Sales	1,000 SF	2.62
842	Recreational Vehicle Sales	1,000 SF	2.54
843	Automobile Parts Sales	1,000 SF	5.98
848	Tire Store	1,000 SF	4.15
850	Supermarket	1,000 SF	9.48
851	Convenience Market (Open 24 Hours)	1,000 SF	52.41
852	Convenience Market (Open 15-16 Hours)	1,000 SF	34.57
853	Convenience Market with Gasoline Pumps	1,000 SF	50.92
854	Discount Supermarket	1,000 SF	8.34
857	Discount Club	1,000 SF	4.18
860	Wholesale Market	1,000 SF	0.88
861	Sporting Goods Superstore	1,000 SF	1.84
862	Home Improvement Superstore	1,000 SF	2.33
863	Electronics Superstore	1,000 SF	4.50
864	Toy / Children's Superstore	1,000 SF	4.99
866	Pet Supply Superstore	1,000 SF	3.38
867	Office Supply Superstore	1,000 SF	3.40
875	Department Store	1,000 SF	1.87

Code	Description	Unit of Measure	Trips Per Unit
876	Apparel Store	1,000 SF	3.83
879	Arts and Craft Store	1,000 SF	6.21
880	Pharmacy / Drugstore without Drive-Through Window	1,000 SF	8.4
881	Pharmacy / Drugstore with Drive-Through Window	1,000 SF	9.91
890	Furniture Store	1,000 SF	0.45
896	DVD/Video Rental Store	1,000 SF	13.60
SERVICES			
911	Walk-In Bank	1,000 SF	12.13
912	Drive-In Bank	1,000 SF	24.30
918	Hair Salon	1,000 SF	1.93
925	Drinking Place	1,000 SF	11.34
931	Quality Restaurant	1,000 SF	7.49
932	High-Turnover (Sit-Down) Restaurant	1,000 SF	11.15
933	Fast Food Restaurant without Drive-Through Window	1,000 SF	26.15
934	Fast Food Restaurant with Drive-Through Window	1,000 SF	33.84
935	Fast Food Restaurant with Drive-Through Window and No Indoor Seating	1,000 SF	153.85
936	Coffee / Donut Shop without Drive-Through Window	1,000 SF	40.75
937	Coffee / Donut Shop with Drive-Through Window	1,000 SF	42.8
938	Coffee / Donut Shop with Drive-Through Window and No Indoor Seating	1,000 SF	75
940	Bread / Donut / Bagel Shop with Drive-Through Window	1,000 SF	18.99
941	Quick Lubrication Vehicle Shop	Service Bays	5.19
942	Automobile Care Center	1,000 SF	3.11
943	Automobile Parts and Service Center	1,000 SF	4.46
944	Gasoline / Service Station	Fueling Positions	13.87
945	Gasoline / Service Station with Convenience Market	Fueling Positons	13.51
946	Gasoline / Service Station with Convenience Market and Car Wash	Fueling Positons	13.94
947	Self Service Car Wash	Stalls	5.54
948	Automated Car Wash	1,000 SF	14.12
950	Truck Stop	1,000 SF	13.63

Figure 4. Manual trip Generation (Source: Trip Generation Manual, 9th Edition)

Table 12. Calculation of Generation and Withdrawal in the Transmart Tajur Mall, Bogor

No	Location	Facilities	Area Sqm	Units of measure	ITE coefficient	ITE generation (trips/hour)
1		Low cost Apt	16.380	545	0.58	316
2	TRANSMART	Commercial	2.864	30.83	6.82	210
3		Park and ride	4.200	605	0.62	375
		Total	23.444	1.181		901

(Source: Analysis Results, 2019)

Table 13. Generation of Transmart Tajur

Generation tranSMART	Tajur		
Sqm	Sqf	Koeficient	Trips/hour
4.810	52	9.48	491

(Source: Analysis Results, 2019)

Study Zone Conditions and MAT 2019

Six zones in one study sub-district were observed based on the administrative division of the kelurahan.

Table 14. Zoning of the Study Area

Zona	Kelurahan	Sub-district
1	Baranangsiang	Bogor Timur
2	Katulampa	Bogor Timur
3	Sindangrasa	Bogor Timur
4	Sukasari	Bogor Timur
5	Tajur	Bogor Timur
6	Sindagsari	Bogor Timur

(Source: Analysis Results)

Origin Destination Matrix

MAT is a two-dimensional matrix that contains information about the amount of movement between zones within a certain area. The row represents the zone of origin and the column represents the destination zone, so that each matrix cell represents the magnitude of the movement flow that moves from the origin zone i to the destination zone.

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Table 15. Existing MAT in 2019

				MAT 2019				
Year 2019	Zona No	1	2	3	4	5	6	OI
	1	0	610	65	5	21	23	724
TRANSMART	2	2.044	0	151	16	582	39	2.832
	3	1.561	1.088	0	12	51	75	2.787
	4	1.617	2.841	302	0	53	42	4.855
TRANSMART	5	1.099	562	205	16	0	134	2.016
	6	2.324	1.619	234	25	30	0	4.232
	DD	9.645	6.720	957	74	737	313	1

(Source: Analysis Results)

Table 16. Existing MAT in 2025

				MAT 2025				
Year 2025	Zona No	1	2	3	4	5	6	OI
	1	0	647.53	69.00	5.31	22.41	24.41	769
TRANSMART	2	2169.75	0	160.29	16.98	617.80	41.40	3006
	3	1	1154.93	0	12.74	54.14	79.61	2958
	4	1716.48	3015.78	320.58	0	56.26	44.58	5154
TRANSMART	5	1166.61	596.57	217.61	16.98	0	142.24	2140
	6	2466.97	1718.60	248.40	26.54	31.85	0	4492
	DD	9177	7133	1016	79	782	332	1

(Source: Analysis Results, 2019)

Road Network in the Study Area

Road network modeling in the study location is shown in Figure 5 below.

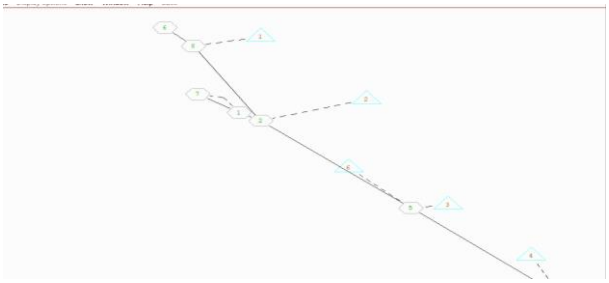

Figure 5. Road network modeling (Source: Analysis Results, 2019)

The following is presented in Figure 3 in the form of the road loading (VCR Variable Intensity) of the study location.

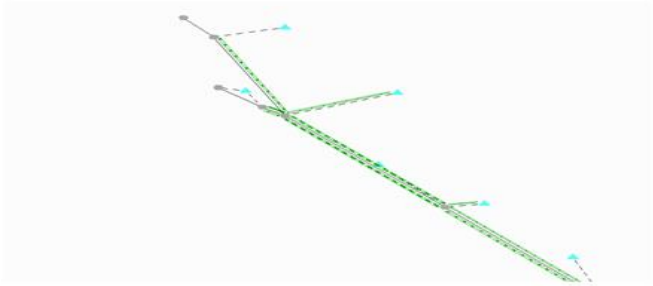

Figure 6. VCR Variable Intensty and MAT 2019 (Source: Analysis Results, 2019)

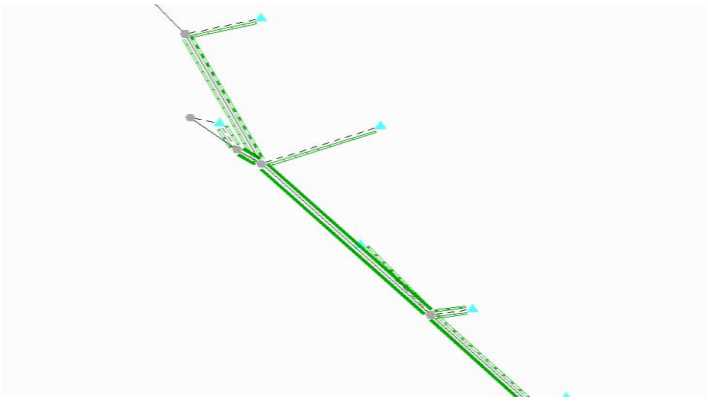

Figure 7. VCR Variable Intensty and MAT 2025 (Source: Analysis Results, 2019)

There is also a Generation and Pull Movement Pattern at the Study site using the origin-destination matrix modeled on the SATURN application as shown in Figure 8 below.

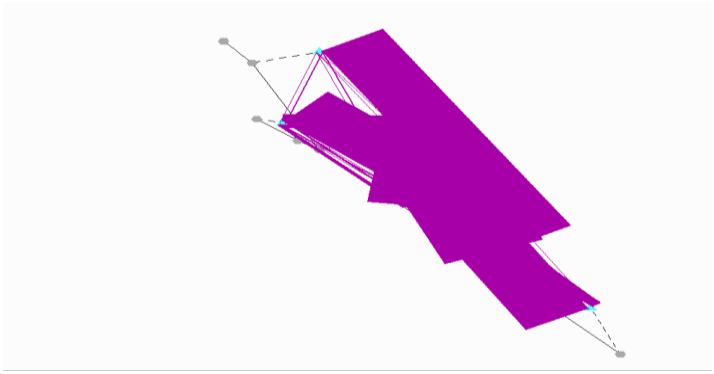

Figure 8. The Pattern of Generation and Withdrawal of the Existing Study Location 2019 (Source: Analysis Results, 2019)

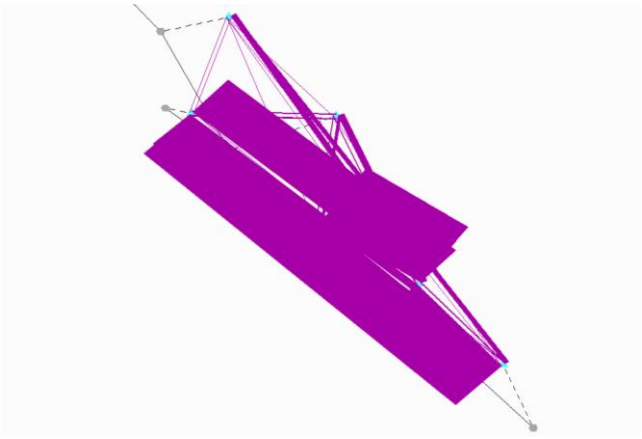

Figure 9. The Pattern of Generation and Withdrawal of the Existing Study Sites in 2025 (Source: Analysis Results, 2019)

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Results of Network Calibration and Transportation Modeling Equation Design

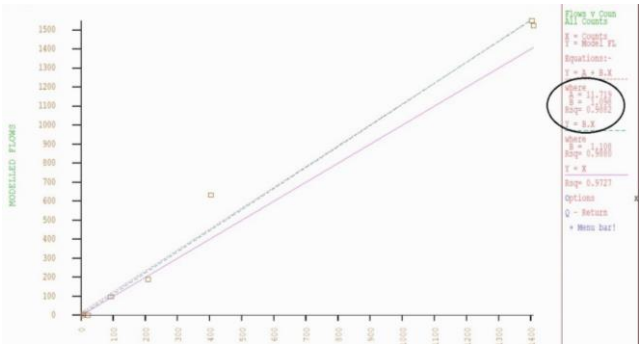

Figure 10. Results of Network Calibration in East Bogor District 2019 Y = 11,719 + 1,098. (X)
(Source: Analysis Results, 2019)

CONCLUSION

Based on the results of the analysis and discussion, the following conclusions can be drawn: Existing conditions of the primary arterial and primary collector road networks in the study area, it is found that LOS in the range B to E. several roads that are quite congested due to the desire to be close to capacity, and the lack of traffic control for vehicles that stop carelessly, less orderly street vendors and so on. The construction of the Tajur Transmart Mall in East Bogor District in 2019 with an generated value of 9,074 pcu/hour and an attraction of 491 trips/hour. Then in 2025 with a generation value of 12717 pcu/hour and an attraction of 491 trips/hour. Traffic problems Jl. Raya Tajur 1 and Jl. Raya Tajur 2 is the high level of travel which is indicated by the high value of the VCR. Especially during the peak hours of the afternoon (16.00 -17.00) for the direction of entering and leaving the study area and the peak hours of the daytime (12.00 - 13.00). this is due to these roads.

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