

# An Effect Awakening and Pulling on Infrastructure Campus II Universitas Medan Area

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**Abstract**— The Tranintersectionortation can be interpreted as an effort made to move people, goods, and services from a place of origin to destination, with the added benefit to getting additional economic value. Self-tranintersectionortation is not a basic human need, but derived demand that will accompany all efforts to meet human basic needs, such as food fulfillment, clothing, shelter, health, and education. The rise and pull of the journey is the beginning of the traffic movement. After the journey is raised and drawn by a land use, then there is the travel distribution of a zone with a homogeneous land use to the zone with other homogeneous land uses as well. This data collection by surveying the intersectionace and calculating the amount of traffic and the user of the mode through the research location that resulted in the rise and pull on the surrounding development sites, in addition, these data will not be solved without the help of secondary data (land area data, type activities, location map). This analysis is done by using the Costram method, then the result of the research is got the number of students 3,112 people and the number of generated get 466,8 / hr, so predicted University of Medan Area (Campus II) if operating will generate 700,2 smp / hour. So after operating the University of Medan Area (Campus II) with a building area of 7.483 m<sup>2</sup> which will require parking intersectionace as much as 124.71 SRP with a land area that must be required +1.995.50 m<sup>2</sup>.

**Keywords**— Tranintersectionortation, a homogeneous land, university of Medan Area.

## I. INTRODUCTION

Tranintersectionortation could be interpreted as an effort made to move people, goods and services from a place of origin to their destination, with the benefit of getting more economic value (added value). Own tranintersectionortation is not a basic human need, but a derived demand that will go with all efforts to fulfill basic human needs, such as the full-ffllment of food, clothing, shelter, health and education [1].

A case on Medan City, have mode of tranintersectionortation that develops and becomes the backbone of society for travel is highway-based tranintersectionortation, commonly called highway traffic [2]. Components forming highway traffic include facilities connected by infrastructure in a movement system. Highway traffic is part of a system of land use activities so that it can be interpreted that a movement people, goods and services to increase economic value caused by differences in use land between two places [3].

As described above, educational facilities are one of the activities that use land that attracts significant amounts of travel. Development of educational facilities must be planned comprehensively [4], taking into account the possibility of traffic problems as a result of the development of these educational facilities. Based on the description above, the plan for developing the Medan Area University (Campus II) on Road. Sei Belutu, Road. Sei Serayu. No. 70A/Road. Setia Budi No. 79B, Medan is very influential on the surrounding traffic system so that the initiator must be accompanied by a study of Traffic Impact Analysis [5].

Basically the forecasting of travel needs is aimed at estimate the number and place of tranintersectionortation needs (for public tranintersectionort and private vehicles) to predict the future [6].

### • Awakening and Attracting Travel

Trip generation is a stage of modeling that estimates the number of movements originating from a zone or land use and the number of movements attracted to a land use or zone [6].

Generating this traffic includes:

- Traffic leaving a place
- Traffic that leads to or arrives at a place.

### • Affecting Factors

In modeling trip generation, things that need be considered are not human movements, but also the movement of goods.

- Generating movement for humans
- Pull movement for humans
- Generating and pulling movements for goods.

## II. LITERATURE REVIEW

Andalalin is a course of an impact traffic from a particular activity or business whose results are expressed in the form of Andalusal documents or planning traffic arrangements. In the Minister of Tranintersectionortation Regulation No.PM 75 2015 concerning the implementation of Traffic Impact Analysis. [7]

Traffic Impact Analysis is a series of study activities concerning the impact of traffic from the construction of activity centers, settlements and infrastructure whose results are set forth in the form of documents resulting from the analysis of traffic impacts. Analysis of traffic impacts is carried out by consulting institutions that have certified experts. The results of the analysis of the impact of traffic must obtain approval from the relevant agencies in the field of traffic and road tranintersectionortation [8].

### • Preparation of Andalalin Documents

In the Minister of Tranintersectionortation No. PM 75 of 2015 article 9 states that the Traffic Impact Analysis contains at least:

- Planning and traffic impact analysis methodology
- Analysis of traffic generation / attraction and road tranintersectionort as a result development based on the technical rules of tranintersectionortation by using the trip rate factor set nationally
- Analysis of travel distribution

4. Analysis of modal selection
5. Analysis of trip loading
6. Simulation of traffic performance carried out on the analysis of traffic impacts
7. Details of government and developer reintersectionabilities or development in handling impacts
8. Monitoring and evaluation plan
9. Monitoring by developers or builders, and
10. General description of the location to be built or developed [9].

• *Characteristics of Traffic Volume*

Traffic volume is the number of vehicles that pass / cross a point that remains on the road in units of time, which is usually calculated in vehicles / days or vehicles / hours. The volume on a road will vary depending on the total volume of two directions, the direction of traffic, daily, monthly, annual and in the composition of the vehicle.

• *Passenger Car Unit*

The passenger car unit is a method created by traffic engineering experts in providing factors that allow for a benchmarking measure of the amount of road surface intersection used by every type of road user

• *Road Capacity*

Capacity is the maximum volume of a vehicle that can be expected to go through a piece of road for a certain period of time for certain conditions.

TABLE I. Ratio of size city.

Capacity Location	Fcs
<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

Algorithm of the ratio are:

$$C = Co \times FCw \times FC_{intersection} \times FC_{sf} \times FC_{Cs} \text{ (smp/jam)}$$

wheres:

C: Capacitas (smp/jam)

Co: Capacitas general (smp/jam)

FC: Factor of traffic roadpenyesuaian lebar jalur lalu lintas

FC intersection: Factor behind road

Service Level

The level of service is a method that is possible to give size constraints be able to answer questions if the condition of an existing road segment still meets the requirements to be passed by the maximum volume of traffic / road users currently available and the increase to the future .

• *Generating and Pull Analysis*

Travel

Trip generation is a stage of modeling that estimates the number of movements that originate from a zone or land use or the number of movements attracted to a land use or zone.

• *Parking performance*

Parking is an activity to stop or store motorized vehicles in a place that has provided before. Parking intersection is

one of the important things in the tranintersectionortation element in particular and its presence cannot be underestimated.

TABLE II. Determination of the parking intersectionace.

No	Vehicles	Parking Intersectionace (m)
1.	Passenger Car	2,50 x 5,00
2.	Bus/Truck	3,40 x 12,50
3.	Motocycles	0,75 x 2,00

III. METHOD

University of Medan Campus This area was built on the former land area of the building, which is located south of Medan city which is part of the Medan Sunggal sub-district. The campus is surrounded by (limited) by the area of residential land. Where the area of the development plan Medan Area University (Campus II) provided is 8.837m2 with building development area 7483 m2. Approximately 84.6% of the building and to the parking lot of 1,354 m2 approximately 15.4%.

• *How Data Collection*

Data collection techniques implemented by way of a field survey at the sites. For some things on traffic analysis, use of secondary data due to complete datadengan same source. This type of research data are grouped into two primary data and secondary data.

IV. ANALYZE AND RESULT

A good facilities and infrastructure development, the development of buildings, roads, housing, hointersectionitals and shops that will be able to have an impact on traffic patterns with the presence of the University Medan Area (Campus II) is, firstly need to do an analysis of the location or region.

TABLE III. Geometric road around the development of Medan Area University (Campus II), Medan.

No	No Link	Name of District	Road section	Kec	wids (m)	light (m)	noted
1	211	Setia Budi road	rnd. Intersection. road. Sunggal s/d Intersection. road. Sei Serayu	34.30	5.28	787.15	4/2D
2	212	Setia Budi road	rnd. Intersection. road. Sei Belutu s/d Intersection. Road. Sei Serayu	35.56	6.20	106.08	4/2D
3	311	UMA 1 road	rnd. UMA s/d Intersection. road. Setia Budi	3.20	6.60	32.30	.
4	312	Setia Budi road	rnd. Intersection. road. Sei Serayu s/d Intersection. road. Setia Budi	17.21	5.29	97.08	4/2D
5	311	Sei Serayu road	rnd. Intersection. road. Setia Budi s/d Intersection. road. Sei Serayu	28.35	6.78	93.54	2/2UD
6	312	UMA 2 road	rnd. UMA s/d Intersection. road. Sei Serayu	6.21	4.48	46.29	.
7	331	Darulalam road.	rnd. Intersection. road Sei Serayu s/d Intersection. road Sei Belutu	23.45	4.14	188.38	2/2UD
8	341	Sei Belutu road	rnd. Intersection. Road. Darulalam s/d Intersection. road. Sei Belutu	46.57	4.27	999.62	2/2UD
9	342	UMA 3 road	rnd. UMA s/d Intersection. road. Sei Belutu	5.91	4.15	26.15	.

In the calculation of the capacity of roads using the effective width jaan namely road width that can actually be used, because there are several roads that have a large enough road width, Traffic flow but used only for the fact that the

effective width and the unused portion be used for industry places and vehicle parking.

TABLE IV. Capacity of improvement roads.

No	Link	Value Area	Street	Leght (m)	C
1	2	3	4	5	6
1	211	Road. Setia Budi	md. Intersection. Road. Sunggal s/d Intersection. Road. Sei Serayu	5.28	2,751.22
2	211	Road. Setia Budi	md. Intersection. Road. Sei Belutu s/d Intersection. Road. Sei Serayu	6.22	2,631.60
3	311	ROAD. UMA 1	md. UMA s/d Intersection. Road. Setia Budi (Pintu Masuk 1)	6.00	1,351.78
4	311	Road. Setia Budi	md. Intersection. Road. Sei Serayu s/d Intersection. Road. Setia Budi (Pintu Masuk 1)	5.29	2,511.99
5	311	Road. Sei Serayu	md. Intersection. Road. Setia Budi s/d Intersection. Road. Sei Serayu (Pintu Masuk 2)	6.28	1,944.73
6	311	Road. UMA 2	md. UMA s/d Intersection. Road. Sei Serayu (Pintu Masuk 2)	4.48	1,351.78
7	331	Road. Darusalam	md. Intersection. Road. Sei Serayu s/d Intersection. Road. Sei Belutu	4.14	1,536.56
8	341	Road. Sei Belutu	md. Intersection. Road. Darusalam s/d Intersection. Road. Sei Belutu (Pintu Masuk 3)	4.27	1,536.56
9	341	Road. UMA 3	md. UMA s/d Intersection. Road. Sei Belutu (Pintu Masuk 3)	4.15	1,351.78

TABLE V. Traffic volume on the road network around the development site.

No	Link	Ruas Jalan	Penggal Jalan	Volume (smp/jam)
1	2	3	4	7
1	211	Road. Setia Budi	md. Intersection. Road. Sunggal s/d Intersection. Road. Sei Serayu	1,104.7
2	211	Road. Setia Budi	md. Intersection. Road. Sei Belutu s/d Intersection. Road. Sei Serayu	1,181.3
3	311	ROAD. UMA 1	md. UMA s/d Intersection. Road. Setia Budi (Pintu Masuk 1)	48.0
4	311	Road. Setia Budi	md. Intersection. Road. Sei Serayu s/d Intersection. Road. Setia Budi (Pintu Masuk 1)	1,067.8
5	311	Road. Sei Serayu	md. Intersection. Road. Setia Budi s/d Intersection. Road. Sei Serayu (Pintu Masuk 2)	459.9
6	311	Road. UMA 2	md. UMA s/d Intersection. Road. Sei Serayu (Pintu Masuk 2)	29.4
7	331	Road. Darusalam	md. Intersection. Road. Sei Serayu s/d Intersection. Road. Sei Belutu	302.1
8	341	Road. Sei Belutu	md. Intersection. Road. Darusalam s/d Intersection. Road. Sei Belutu (Pintu Masuk 3)	304.5
9	341	Road. UMA 3	md. UMA s/d Intersection. Road. Sei Belutu (Pintu Masuk 3)	50.0

## V. CONCLUSION

From the results of the analysis conducted for the Impact Analysis study Traffic As a result of its operation University of Medan Area (Campus 2) at City of Medan, then some conclusions can be drawn. Pay attention to the plan construction of the Medan Area University (Campus 2) to be built with assuming as many students as possible 3,112

students, then predicted University of Medan Area (Campus 2) if it operates it will awaken as many trips 700.2 pcu / hour; From the results of extensive needs analysis Parking lots that have been done, predictions Required parking space required from the University's operation plan Medan Area (Campus 2) with area building 7,843 m<sup>2</sup> based calculation of Medan Mayor's Decree, then if it operates the school will requires as much parking space 124,71 SRP with the required land area of +1995.50 m<sup>2</sup>.

Therefore, of the land area provided by the developer of 1,354 m<sup>2</sup>, based on calculations from SK Mayor of Medan developer must provide land that still remains less than 641.50 m<sup>2</sup> so as not to disrupting traffic activity around development area. As an alternative others, lack parking area that must be provided for Development of Medan Area University (Campus II) This limits the use of campus parking lots with does not allow students bring four-wheeled vehicles when carry out campus activities (Letters Circular Chancellor No. 85 / UMA-R / II / 2017), can also use parking lots existing located at the entrance on Jl. Setia Budi and Jl. Sei Serayu. For travel speed, based on BSTP (2006), Sustainable Transport is known that speed of traffic in the region urban for the City category Metropolitan is 22.4 Km per hour while the existing conditions at road section in the development area University of Medan Area (Campus 2) is appropriate average speed survey below 22.4 km / hour is 20.91 km / hour. This condition show that speed travel at these locations for conditions the existing is still in a bad condition (assuming that the speed of travel done during rush hour with travel characteristics are carried out in the City of Metropolitan.

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