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TRAFFIC PLANNING IN KUNINGAN CITY CENTER

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ABSTRACT

This research was conducted to improve the performance of service of Siliwangi Road which decreased. The data obtained from the Department of Transportation brass form LHR data brass city, road length, and the average speed of the vehicle, Then in if the degree of saturation of the Road in order to know the success of the New Planning. To facilitate the research and also because it has different problems Siliwangi road for 2 parts cut off by crossing, Siliwangi Street 1 which starts from Cijoho roundabout Until the intersection near Smpn 1 Kuningan has LHR 2563 smp with degree of saturation 0,97 at level Service E and Jalan Siliwangi 2 starting from intersection of Smpn 1 Kuningan Until the junction of Jalan Veteran has LHR 1761 smp with degree of saturation 0,67 level of service C. After in doing traffic engineering level of road service go up, Siliwangi Street 1 become C with degree of saturation 0.57 also Jalan Siliwangi 2 level service C with degree of saturation 0,51.

Keywords: Road performance, traffic engineering, traffic planning

A. BACK GROUND

High civil engineering education has had a long history. Compared with other engineering sciences, civil engineering was among the earliest developed. If we take the meaning of civil engineering as a field of study that aims to provide the infrastructure needed by society in running its life, then it can be said that civil engineering has existed since the first man to run life in the world.

In Civil Engineering there is the science of traffic engineering, which is very helpful in solving traffic problems in a way. Traffic specialists need to recognize the 3 components of roads, vehicles and travelers, to recognize traffic problems that can occur by collecting road geometric information, the amount of traffic flow, traffic speed, traffic constraints, traffic accident data and characteristics of the perpetrator travel.

Criterion of road users is, the road has a relatively fast travel time to achieve the intended destination. But in the implementation of each road will increase solid every year. This has led to an increasing travel time, indicating a decrease in the performance of a road.

In the city of Kuningan, West Java province, there is one street named Siliwangi Street. Inside the Road there is a problem of density due to the high volume of traffic in the city of brass. This is because Siliwanagi Street is the main street in the city center which is located in the side of the street, also the road to the market in the city center, this causes the decline in service performance so that the need for research to find a solution.

B. FOCUS PROBLEMS

This research focuses on brass city traffic planning by traffic engineering and depiction using Google sketch up to improve city road performance

C. LIMITATION OF PROBLEMS

In the thesis entitled "PLANNING OF TRAFFIC IN KUNINGAN CITY CENTER" will explain the problems that exist in the study area, so look for solutions on the problem. Therefore it is necessary to limit the writing that aims for the preparation of Thesis, the restriction of the problem in the lift as follows:

1. Calculating the Volume of vehicles on Highway siliwangi and other Road segments that enter the road siliwangi Kuningan which impact on the capacity and saturation level.
2. Examine the capacity of Road, density and degree of saturation of Siliwangi Road in the central district of brass district to find the problem and determine the solution.
3. Provide solutions by redesigning city traffic, how to engineer traffic and add facilities or infrastructure using google sketch up for 3D images.

D. RESEARCH PURPOSES

a. To plan traffic through current settings.
b. To find out the cause of the density occurring on downtown roads, and solution solutions with the depiction of the road situation along with the solution of setting the direction and addition of

additional facilities or infrastructure, to overcome the problem.

c. Provides an overview of the state of city traffic after a change in traffic conditions

E. USEFULNESS OF RESEARCH
1. Theoretical Aspects

This research is expected to increase the mindset of students in studying, observing, and understanding the problems related to the field of Civil Engineering especially on the problems that exist in the field.

2. Engineering Aspects

This activity can be an input for brass city related to the problem of road service performance degradation in the hope that the problem can be solved well.

D. FRAMEWORK
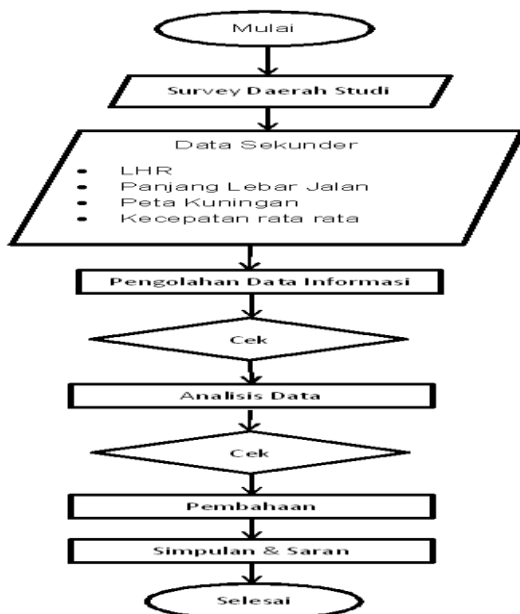
Picture 1.2 Framework

A. LITERATURE REVIEW
1. PREVIOUS RESEARCH

a. The first research conducted by Rian Arief Wibisono (2013) conducted an analysis of the movement of traffic. The research title is Traffic Movement Analysis On Dr Cipto mangunkusumo Road Section in Cirebon City. The problems faced were due to the increasing number of vehicles in the fear that some road segments can no longer accommodate the volume of vehicles that can cause problems in the flow of traffic movement. So that must be conducted analysis of traffic movement.

b. Second Research conducted by Rahmanto Azis Eddyanto (2015) conducted research in the form of Analysis and engineering Traffic. The title of research is Performance Analysis And Traffic Engineering In Cirebon City. The problems faced by the increasing volume of traffic and the increase of new buildings that cause density so that the rotation of the flow in the region is very high and needs to be done traffic engineering.

In Basically Research Past and Which Now has the same goal that is looking for ways to overcome the problem of road performance decline.

B. THEORETICAL BASIS
1. TRANSPORTATION

Transportation is an Integral Part Of a community function. It shows the relationship with lifestyle. And the location of productive activities, and distractions as well as the goods and services available for consumption. (Edward K. Morlok, 1995)

In general, the system can be interpreted as a unity of a unit, a integerity, which is comprehensive (comprehensive) which consists of elements, elements, and components that support each other and work together.

(Drs. Fidel Miro MSTR, 1997)

The Transport components are:

A. Human and Goods

B. Vehicle (conveyance)

C. Roads (where moving vehicles)

While transportation is defined as an effort to move or move a goods or people with various purposes. Then the transportation system when viewed from the terminology is the system of human movement and goods between the origin zone and destination zone within the region concerned, the movement is done by using various means or modes, various sources of energy, and performed for a particular purpose. (Novan Ied Akbar, ST. MT., 2011)

2. DEFINITION OF ROAD PERFORMANCE

a. Performance

Understanding performance refers to the level of success in carrying out the task and the ability to achieve the established goals. Performance is good and successful if the desired goal can be achieved well (Donelly, Gibson and Ivancevich, 1994)

b. Street

The road is a land transportation infrastructure covering all parts of the road, including auxiliary buildings and equipment intended for traffic, located on the soil surface, above ground level, below ground and water, and above the water surface, except the railroad , Lorry trails, and cable roads (Government Regulation Number 34 Year 2006).

According to Bina Marga Road in the division 3 according to its function :

- Arterial roads are roads that serve major transport with long-distance travel features, high average speed, and number of entrances are efficiently restricted.

- Collector road is a road that serves the collector / divider transport with medium distance travel features, medium average speed and number of entrances are limited.

- Local roads are Roads that serve local transport with characteristics of short-haul travel, low average speed, and number of entrances are not restricted.

3. TRAFFIC CONGESTION

If the traffic flow is near capacity, congestion begins. Congestion increases when currents are so large that vehicles are so close to each other. Stalled when the vehicle must stop or move slowly (Ofyar Z Tamin, 2000).

Congestion is a condition where the traffic flow passing over the road under review exceeds the capacity of the road plan resulting in the road freeway rate approaching or exceeding 0 km / h, causing a queue to occur. At the time of the congestion, the value of degree of saturation on the road will be reviewed where the congestion will occur when the value of degree of saturation reaches more than 0.5 (MKJI, 1997).

Congestion when viewed from the level of service (Level of Service), at

the time of LOS <C. LOS <C, traffic flow conditions began to unstable, the operating speed decreased relatively quickly due to side barriers that arise and freedom of movement is relatively small. In this condition the volume of capacity is greater than or equal to 0.8 (V/C > 0,8).

And in the end the value of LOS has reached the level of service, the traffic flow becomes unstable resulting in a heavy delay, called traffic congestion (Ofyar Z Tamin, 1998).

4. TRAFFIC MANAGEMENT

Management is an integrated step sequence that develops an organization as a system that is socio, economic and technical (Kardaman et al., 1996). According to Law No. 14 of 1992, traffic is the motion of vehicles, people, and animals on the street.

According to Malkamah S., (1996) traffic management is the process of arranging and using an existing road system with the aim of fulfilling a particular interest, without the need for addition, the creation of new infrastructure. Traffic management activities include activities of determining traffic policies on certain road networks or segments (eg by signs, traffic marks and lights), while supervisory activities include :

    a. Monitoring and assessment of traffic execution.

    b. Corrective action against the implementation of the traffic policy.

Traffic control activities include :

    a. Giving direction and guidance in the implementation of traffic policy

    b. Providing guidance and counseling to the community in the implementation of traffic policy.

5. TRAFFIC TECHNIQUES

A transportation is said to be good, if travel time is fast enough, no jam, service frequency enough, safe free from possibility of accident and condition of service which is comfortable. To achieve such ideal condition is determined by various factors that become transportation component, that is condition of infrastructure (road) and its network system and condition of vehicle (vehicle), and that is not less important is mental attitude of user of transportation facility.

To know about municipal transportation in the aspect of planning and its implementation, it is important to understand the engineering aspects of the Traffic Enginering (Traffic Enginering), the technique of land transport traffic includes: traffic volume characteristics, road capacity, passenger car units, origin and destination of traffic, And traffic generators (Budi D.Sinulingga, 1999).

6. TRAFFIC CHARACTERISTICS

Characteristics of traffic flows describe the characteristics of traffic flows qualitatively and quantitatively in relation to the speed, magnitude of traffic flows and their relation to the time and type of vehicles using the road space.

✦ Traffic Volume

The volume of traffic is the number of vehicles traveling through a point on a unity of time. In addition, traffic volume can be interpreted as the number of vehicles passing through an appropriate point on the road in time units. Volume is usually calculated in vehicle / day or vehicle / hour. (Abubakar, 1999).

Meanwhile, according to MKJI (1997) That the volume of a vehicle is the number of vehicles passing through a point per unit of time at the location tertenru. To measure the amount of traffic flow.

✦ Degree of Saturation

The degree of saturation is the ratio of volume (current value) Traffic to its capacity. This is a picture of whether a road has a problem or not, based on the assumption that if the road is closer to its capacity, the ease of movement will be more limited. In MKJI 1997, if DS analysis is performed for performance level analysis, then the traffic volume is declared smp (passenger car unit).

✦ Side Barriers

Side constraints are the impact on the traffic performance of road side segment activity, such as pedestrian (weight = 0.5), public vehicle or other vehicle stops (weight = 0.1), vehicle entering or exiting road side (weight = 0 , 7), and slow vehicle (weight = 0.4). As for the determination of Class Side Barriers (SFC).

✦ Road Capacity

The capacity of a road is defined as the maximum number of vehicles that can cross a uniform hourly line, in one direction for two-way two-lane road with a median or two-way total for a two-lane road without a median, for a specified time unit on road conditions and Certain traffic. Road condition is the physical condition of the road, while the traffic condition is the nature of traffic (nature of traffic). (Yuanita, A. 2006).

A. RESEARCH METHOD

The method used is Quantitative method by surveying the traffic flow directly in the center of brass city, especially siliwangi road and other visually related roads.

B. TYPES AND SOURCES OF MATERIAL

Based on the origin of the data grouped in:

a. Primary data

Primary data is data obtained from measurement and observation directly in the field.

b. Secondary data

Secondary data is data obtained from other sources such as government agencies, private, and individuals who have made observations directly in the field.

To make the final task of planning Traffic in downtown Kuningan will be used secondary data, this is related to the efficiency of time and cost of loading this final report.

C. TECHNIQUE COLLECTING INFORMATION

The method of collecting information used for traffic planning at the City Center of this brass is:

a. Methods of literature

The literature method is to collect, identify, and process written data derived from books, newspapers, magazines and other scientific papers related to the planning of the building.

b. Method of observation

Observation method is data obtained from direct survey results to the location. With this direct survey can be known the conditions directly in the field so that obtained a picture that can be taken into consideration in the planning of traffic at the center of Kunigan City.

c. Interview method

Interview method is the information obtained by interviewing the informant to get some information that can add material in the preparation of Kuningan City Traffic planning.

D. RESEARCH INSURANCE
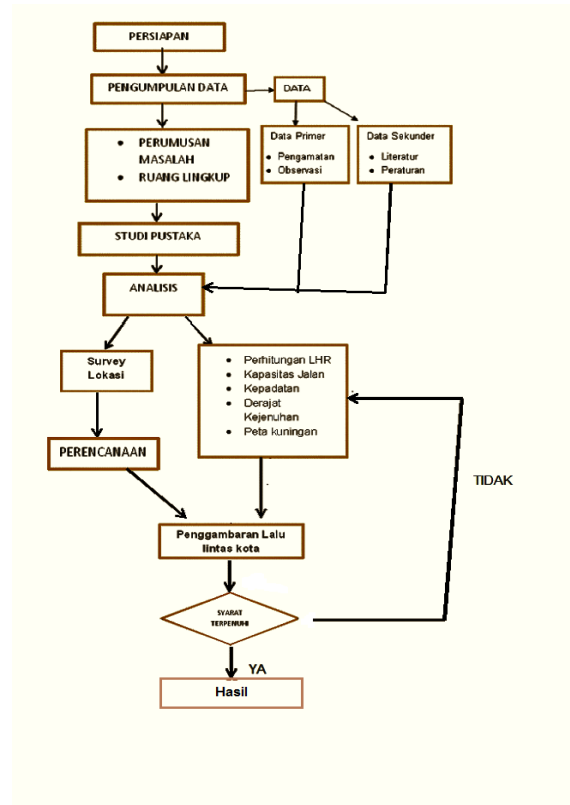
**Picture 3.1** Research Flow Frame

E. ANALYSIS METHOD

Regarding methods and methods of processing the material to be used will be discussed in more detail in separate chapters. This is done because this stage is very important and decisive in the planning of City Traffic. The discussions reviewed will be more detailed and specific so that required a separate chapter in the effort of drawing conclusions.

Stages of data analysis used in this paper are as follows:

a. LHR calculation

b. Average velocity calculation

c. Free current speed

d. Calculation of density

e. Calculation of Road Capacity

f. Calculation of Degree of Saturation

g. Traffic Alignment

F. RESEARCH LOCATION

This research is located in Kuningan city center, precisely at Siliwangi Street and surrounding road connected to Siliwangi road.
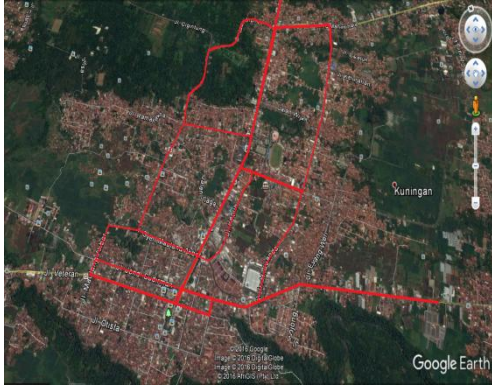
Picture 3.2 research location

A. GENERAL DESCRIPTIONS

1. Characteristics of Siliwangi Road

Siliwangi is a road located in the center of Kuningan city of West Java. In its function Siliwangi Road is a road that is connected from among the City because it is a road that leads directly to the center of Kuningan City, plus the potential of brass as a tourist destination that forces the road siliwangi continues in through many vehicles from year to year.

The physical characteristics of this road segment consist of geometric condition of road segment and road profile profile. The geometric condition of the road segment is explained in cross section. In general, the characteristics of the Siliwangi road segment are as follows:

a. The length of the Siliwangi Road in detail is 2 km with a road width of 8 meters

b. The type of Siliwangi Road segment is 2 lanes

c. Utilization of land around the road is mostly for shops and shopping centers

Based on the geometry analysis, Siliwangi road segment has a length of 2 km, and width of 8 m, type of road 2/2 UD, right and left sidewalk width of 2 m.

2. Causes of Congestion

a. Use of sidewalks

Picture 4.2 Activities on the sidewalk

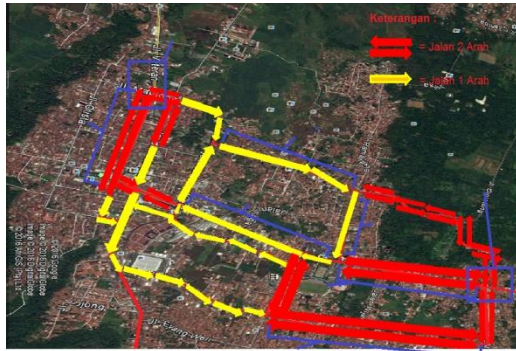The use of sidewalks by traders causing pedestrians to descend to the Road section and cause side barriers.

b. Parking Area

Picture 4.3 Roadside Activities

The parking space provided instead creates a side obstacle problem, as it uses the shoulder of the road..

c. Siliwangi Road 2 Directions

Picture 4.6 Traffic Directions

Because in part of Siliwangi Road still use 2 direction causing level of service of road down due to traffic volume of very solid vehicle..

3. Calculation Level of service

✦ **Free Flow Rate**

FV = (FVo +FVw) x Fvsf x FFVcs

FV = (42+3) x 0,88 x0,95

FV = 37,6 km/jam

While the average speed that occurs is 26.24 km / hour..

✦ **Road Capacity**

C = Co x FCw x FCsp x FCsf x FCcs

C = 2900 x 1,14 x 1 x 0,84 x 0,95

C = 2.638,188 ~ 2.638 smp/jam

✦ **Degree of Saturation**

DS Jl. Siliwangi 1 = $\frac{Q}{C}$

DS Jl. Siliwangi 1 = $\frac{2563}{2.638} = 0,97$

Level of service E

DS Jl. Siliwangi 2 = $\frac{Q}{C}$

DS Jl. Siliwangi 2 = $\frac{1761}{2.638} = 0,67$

Level of service C

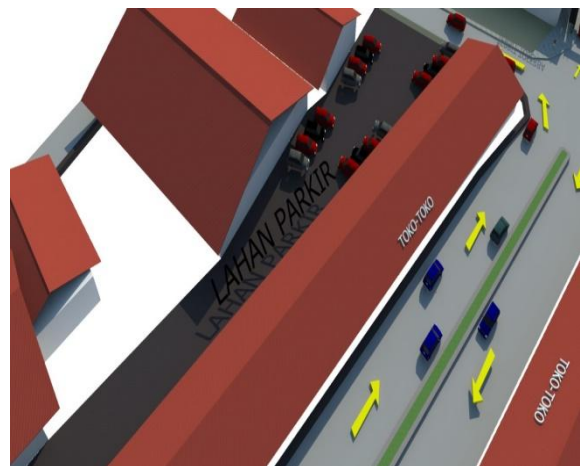### 4. The congestion solution

a. Giving Traffic Signs

Picture 4.18 Giving Traffic Signs

Provision of signs are needed to provide information on which places can be used to stop, park or trade, so as not to interfere with road activity.

b. Addition of Facility

Picture 4.15 New Parking Condition

Additional facilities for parking vehicles, in because the parking lot that is currently still using the road and cause high side barriers.

Picture 4.11 Pedestrian bridge

The addition of crossing bridges, to reduce the conflict of pedestrian currents.

c. Traffic Flow Settings

Picture 4.7 New Directions

Arrangement of direction to reduce the volume of vehicles entering on the road Siliwagi, so as not to interfere with the level of service Other roads are also included in the calculation.

5. CHECKING CALCULATIONS

- **Degree of Saturation**

1. DS Jl. Siliwangi $1 = \dfrac{Q}{C}$

DS Jl. Siliwangi $1 = \dfrac{1.508}{2.638} = 0{,}57$

Service Level C

DS Jl. Siliwangi $2 = \dfrac{Q}{C}$

DS Jl. Siliwangi $2 = \dfrac{1340}{2.638} = 0{,}51$

Service Level C

DS Jalan Baru Kuningan

$DS = \dfrac{Q}{C} = \dfrac{1054}{2535} = 0{,}415 \sim 0{,}42$

Service Level B

DS Jalan Ir. H. Juanda

$DS = \dfrac{Q}{C} = \dfrac{793}{2638} = 0{,}3$

Service Level B

Can be seen the solution by way of traffic flow managed successfully,

because it can improve the performance of brass siliwangi road without disturbing the performance of other roads.

A. CONCLUSION

After data collection, discussion and analysis in the previous chapters based on existing data, it can be drawn a conclusion as follows:

1. Siliwangi Road has 2/2 UD Road type with 2 meter long road, 2 m width road, 8 m wide road and 2 m wide sidewalk. Has a service level E which starts from Cijoho roundabout to Simpang Smpn 1 Kuningan, then from Simpang Smpn 1 Kuningan to the end in Taman Kota has service level C, but because in that area there are many shops and market so need additional facility that is parking area and Other facilities.

2. To improve the performance of Roads must make Siliwangi Road to be full 1 direction as well as several other roads that affect the Road Siliwangi and the addition of facilities to improve road performance.

3. After the change becomes full 1 direction at Jalan Siliwangi, Aruji kertawinata, and road Ir. H. Juanda Road service performance increased from E to C. in degree of saturation

of Jalan Siliwangi Starting from Cijoho Roundabout until junction of Smpn 1 Kuningan which initially was at the number 0.97 down to 0.57 also Siliwangi Street starting from crossing Smpn 1 brass To The Park The city changed from 0.67 to 0.51.

4. For the addition of facilities and signs make the road performance even better.

5. From the result of the implementation of a 1-way road, the vehicle from Tasik direction through the city center of the current through the new Road Kuningan, and vehicles from the direction of the city must come out through Jalan Ir. H. Juanda.

B. ADVICE

1. This research still needs to be tested further with other research in order to get maximum result.

2. Need to be implemented Immediately, the application of Siliwangi Road to Full 1 direction to improve the performance of the Road.

3. Provision of signs should be given to assist driver's passion.

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