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Analysis of on-Street and off-Street Parking Space Characteristics and Needs Along Jalan Ir.H. Juanda, the Colorful Village Tourist Area in Jodipan Village, Malang City

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ABSTRACT

Jodipan Colorful Village is located in Jodipan Subdistrict, Blimbing District, Malang City. Initially, three neighborhood units in RW 02 were known as a tourist village. Positioned on the banks of the Brantas River and beneath a bridge, it has become a unique urban tourist destination. However, being in a densely populated area, the influx of vehicles has increased, posing challenges for the city government in managing parking systems. This study aims to evaluate the parking characteristics and space requirements for on-street parking in the area. A quantitative descriptive method was used, with calculations performed in Excel. The results show that Point A recorded the highest parking volume and accumulation on both weekdays (146 vehicles) and holidays (230 vehicles). Only Point A had a parking index greater than 1. The highest turnover rate occurred at Points A and B during holidays. Parking space needs were 32 SRP at Point A, 17 SRP at Point B, and 18 SRP at Point C.

Keywords : ***Parking, Vehicles, Analysis of Characteristics and Parking Space Requirements***

INTRODUCTION

In transportation systems, one of the most common issues is parking. Parking problems are found in major cities across Indonesia as well as in growing urban areas. These issues can affect vehicle movement, especially in areas with high activity levels. Vehicles parked along roads can obstruct traffic flow, leading to congestion. To address this, sufficient parking areas must be provided, along with appropriate parking models, where parking demand and available infrastructure (supply) are balanced and tailored to parking characteristics.

Limited urban space and the lack of parking facilities—such as lots or buildings—in certain city areas often force roads to be used as parking areas. This reduces the effective road width and decreases road capacity, which in turn contributes to traffic congestion (Warpani, 2002). Parking has become a complex issue in many large cities, and it remains a major concern in urban transport systems.

Parking is generally divided into two types based on location: on-street parking and off-street parking. In urban areas, limited off-street parking—whether in lots or designated zones—often leads to overflow parking on roads, which decreases road capacity, causes bottlenecks, and contributes to traffic disorder and congestion (Munawar, 2005). The use of roads as parking areas causes congestion, which begins with delays and disruption on traffic lanes (Supriatna, 2008). Parking issues are a phenomenon worth examining. Evaluating these problems can offer alternative solutions to meet parking space demand, particularly where current facilities are inadequate. According to Nabal (2014), the lack of adequate parking facilities and space has become a major issue, necessitating expansion of parking areas. In tourism sites, limited parking often leads visitors to park on the street. This is seen as more convenient for access and for conducting other activities (Savenny, 2017).

At certain times, especially during peak hours, parking in tourism areas becomes highly saturated. This highlights the need to measure parking space requirements and to arrange designated parking zones to manage tourist vehicles more effectively (Rahmawati, 2016). High levels of roadside activity can disrupt traffic flow. Conflicts such as delays can result in congestion, reducing safety and

comfort for road users, decreasing travel speeds, increasing travel time, and raising vehicle operating costs. As roadside activity increases, road capacity decreases, resulting in a high saturation level (Asih and Muthohar, 2012).

Accessibility is crucial for supporting tourism, as better access shortens distance and improves travel efficiency. The quality of transportation in tourism is important, but ease of access, reasonable pricing, and safety for tourists must also be ensured (Moeis and Fahmi, 2012). According to Ningsih (2010), the level of road service is a method used to assess whether a road segment can handle the current and future traffic volumes. To assess traffic density, a traffic density analysis is required to understand road conditions in main network routes.

Gani et al. (2014) state that vehicle maneuvers when exiting on-street parking interfere with traffic flow, increasing density and decreasing road performance. Road capacity is reduced when on-street parking is allowed, as opposed to when off-street parking is used. These maneuvers lower vehicle speeds and increase travel time. A potential solution is to allow only single-row on-street parking and to prohibit it on critical road segments.

Malang City holds strong economic potential due to its thriving tourism, industrial, and trade sectors. Besides large-scale industries, there are also many small and medium-sized enterprises. With the presence of malls, artificial attractions, shop houses, and markets, the surrounding areas have become economically significant. Nearly the entire city center draws people in for economic activities. However, this economic growth has contributed to transportation and mobility challenges. As transportation becomes more accessible and private vehicle ownership increases, road usage grows rapidly.

Kampung Warna-Warni Jodipan is located in Kelurahan Jodipan, Blimbing District, Malang City. Initially, three RTs in RW 02 were known as a tourist village. Situated along the Brantas River and beneath a bridge, this area has been transformed into a colorful village tourist attraction. The increase in tourists has overwhelmed the available off-street parking, causing vehicles to park along Ir. H. Juanda Street. This shift has turned road space into makeshift parking, creating inconvenience for tourists and disrupting traffic flow. This study aims to examine the parking conditions along Ir. H. Juanda Street in the Kampung Warna-Warni tourist area of Kelurahan Jodipan, Malang City, particularly by determining the actual demand for parking spaces in the area.

Parking is an event when a vehicle is stationary and not moving for a certain period of time and is not temporary (Directorate General of Land Transportation Dalam Raharjo (2011). Meanwhile, according to (Taju, 1996), parking is a location or area used to place or place a vehicle (means of transportation) by stopping the vehicle for a required period of time.

Furthermore, parking according to (Abubakar 1998) explains that parking is a situation where a vehicle is stationary/not moving for a period of time that is not temporary. Pignarto (1993) and Sukanto (1995) further add that parking is basically stopping, placing/storing a vehicle/means of transportation such as cars, motorcycles, bicycles, and so on for a short period of time in a certain area/location, and the location or area can be a garage or a place that has been provided for storing or parking the vehicle. And finally, regarding the definition of parking, Poerwadarminta (1984) added, stating that parking is a location used by vehicles or other means of transportation as a stopping point for a specific period of time.

The following are the types of parking according to the Directorate General of Land Transportation (1996) Parking by Location On-street parking, parking on the edge of a public road is parking located along the edge of the road. For parkers, this type of parking is considered very advantageous because it is close to the desired destination (Directorate General of Land Transportation, 1998).

RESEARCH METHODS

Research methods are generally scientific methods for obtaining and analyzing data for specific purposes and uses. This is to maximize the desired results of the research entitled "Analysis of Parking Characteristics and Parking Space Requirements for Motor Vehicles in On-Street and Off-Street Parking Areas Along Jalan Ir. H. Juanda, in the Jodipan Colorful Village Tourism Area, Malang City." The topics discussed include research specifications, research stages, data collection methods, and analysis methods. In any research process, the data collection stage must be planned to obtain optimal data in accordance with the research objectives and targets for subsequent processes. The quality of the

research instruments and the quality of data collection are two key factors that influence the quality of research data. Data collection is conducted through primary and secondary sources.

The method used in the parking characteristics analysis stage is quantitative descriptive. This method aims to provide a systematic, factual, and accurate description and overview of the facts in the study area. The quantitative analysis method is a scientific approach that views reality as classifiable, concrete, observable, and measurable, with causal relationships between variables. The research data is numerical and the analysis uses statistics. This is the basis for the researcher's use of quantitative descriptive analysis to address the research objectives at the study location. Using this method, the researcher analyzed parking characteristics by considering the results of field surveys regarding parking accumulation, parking volume, average parking duration, parking capacity, parking index, and parking turnover.

Parking space needs analysis is the number of spaces required to accommodate vehicles requiring parking based on the facilities and functions of a land use. After identifying parking characteristics at the study location, the next step is to conduct a parking space needs analysis by taking into account parking characteristics calculations to determine parking space requirements. In this parking space needs analysis, the researcher used a quantitative descriptive method.

RESULTS AND DISCUSSION

Parking characteristics were analyzed using quantitative descriptive analysis. Quantitative analysis is a scientific approach that views reality as classifiable, concrete, observable, and measurable, with causal relationships between variables. The research data is numerical and the analysis uses statistics. Parking volume, accumulation, index, capacity, and parking duration were calculated to determine parking characteristics at the research location. The number of vehicles entering and leaving was first calculated to determine parking volume.

The number of vehicles entering and leaving the research location is the initial step, which involves counting the number of vehicles arriving and parking at the research location. This calculation is performed at intervals of every 60 minutes (1 hour) to obtain a detailed understanding of the number of vehicles arriving and leaving. This calculation uses both holiday and weekday samples, namely Thursday (a weekday) and Sunday (a holiday). The calculation results can be seen in Table 5.1 and Table 5.2, as follows:

Table 5.1
Data on Vehicles Entering and Exiting on Weekdays at Locations A, B, and C

Time	A		B		C	
	In	**Out**	**In**	**Out**	**In**	**Out**
Number of Vehicles Existing Before 09.00		8		2		1
09:00-10:00	8	1	7	5	6	4
10:00-11:00	26	18	16	13	7	4
11:00-12:00	11	16	7	12	4	8

Parking Space Requirements are the number of spaces required to accommodate vehicles requiring parking based on the facilities and functions of a land use. To determine parking requirements in a study area, it is first necessary to know the purpose of parking (Abubakar, 1998). The formula used to calculate parking space requirements is as follows:

$$S = Nt.D/T.f$$

S = Number of parking spaces (vehicles); Nt = Volume (vehicles);
D = Average parking time (hours/vehicle);

Time	A		B		C	
	In	**Out**	**In**	**Out**	**In**	**Out**
12:00-13:00	10	10	13	10	12	**5**
13:00-14:00	19	19	13	14	8	**10**

14:00-15:00	27	20	14	14	9	**10**
15:00-16:00	29	22	11	6	18	**13**
16:00-17:00	8	31	4	12	5	**16**
Total	**146**	**137**	**87**	**86**	**70**	**70**

(sumber : hasil survey 2024)

Table 5.2
Data on Vehicles Entering and Exiting on Holidays at Locations A, B, and C.

Time	A		B		C	
	In	Out	In	Out	In	Out
Number of Vehicles Existing Before 09.00	9		1		**3**	
09:00-10:00	20	8	13	5	7	**3**
10:00-11:00	29	18	15	12	20	**13**
11:00-12:00	**39**	**16**	**19**	**18**	**20**	**30**

T = Survey duration (hours);
F = Factor, 0.85 to 0.95

Table 5.3
Currently Required Parking Spaces

Point Location	Duration of Survey Time (Hours) (T)	Insufficiency Factor (Due to Turnover) (f)	Average Length of Parking (Hours/Vehicle) (D)	Vehicle Volume (Nt) (Vehicle)	Number of parking spaces S=(Nt* D)/(T*f) (SRP)
A	8	0.90	1	230	**32**
B	8	0.90	1	123	**17**
C	**8**	**0.90**	**1**	**130**	**18**

Based on the analysis results presented in Table 5.25, covering three locations, the following results were obtained:
1. At location A, the current need for parking spaces is 32 parking spaces, while the number of available parking spaces at the research location is 40.
2. At location B, the current need for parking spaces is 17 parking spaces, while the number of available parking spaces at location B is only 16.
3. At location C, the current need for parking spaces is 18, while the number of available parking spaces at the research location is 30.

Map 5.1
Parking Space Needs Analysis

Based on the research and analysis conducted to calculate the current parking space requirement, the location that requires additional parking spaces is point B, which is off-street parking. This is because the vehicle capacity does not match the available parking capacity, which is 16 spaces, while the current need for parking spaces, based on the analysis, is 17. Therefore, several recommendations are proposed to address this capacity issue. First, it is recommended to provide/assign active parking attendants at each parking location to assist in organizing parked vehicles, thereby making parking provision more effective. Alternatively, another alternative is to modify the parking pattern so that the existing parking spaces can accommodate the current number of vehicles.

CONCLUSION

This study examined parking characteristics and parking space needs in the tourism area of Kampung Warna-Warni Jodipan, specifically along Ir. H. Juanda Street. The findings revealed that while Locations A and C had sufficient parking spaces to meet current demand, Location B had a shortfall of one space, indicating a capacity issue in that area. The analysis was based on vehicle volume, average parking duration, and turnover rate, using a quantitative descriptive method supported by field data collected on weekdays and weekends.

To address the parking shortage at Location B, several solutions are recommended. One is to deploy active parking attendants to help arrange vehicles more efficiently, maximizing the use of existing space. Another option is to revise the parking layout or pattern to increase the number of usable parking slots. These steps aim to improve traffic flow, reduce congestion, and enhance the overall visitor experience in this growing tourist destination.

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