Analysis of Parking Space Needs on the Kornita High School

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ABSTRACT

Kornita High School is a Senior High School located on Jalan Tanjung Kampus IPB Darmaga Bogor, which is under the auspices of the Dharma Foundation of the Bogor Agricultural Institute. The school has grown and developed since 1986. Generally, in the school area, the need for parking space is quite large considering that most students, teachers, and employees bring private vehicles. In solving this problem, this study aims to determine the characteristics of parking, capacity and parking space needs that occur at this time. Based on the data obtained from the maximum volume of motorcycle parking included in the parking load, namely the number of vehicles during a certain time period occurred on Monday, October 23, 2023, as many as 149 vehicles, with the maximum accumulation of motorcycle parking vehicles parked during a certain time period of 148 vehicles, with a maximum motorcycle parking duration (in hours) of 10:00 hours. For the maximum average duration, it occurred at 09:36 hours. For the minimum duration, it occurred at 0:47 minutes, with the highest parking turn over of motorcycles in a certain period of time reaching 123.14%. The motorcycle parking index is the percentage of the number of vehicles parked in the Kornita High School parking area, the highest reaching 122.31%, this shows that the performance of motorcycle parking is quite high, this is indicated by seeing the parking index exceeding 100%. thus the parking capacity for motorcycles available is not sufficient to accommodate motorcycles in the Kornita High School parking lot.

Keywords: parking needs, SRP, parking lot, parking duration, Kornita High School.

INTRODUCTION

Kornita High School is a Senior High School located on Jalan Tanjung Kampus IPB Darmaga Bogor, which is under the auspices of the Dharma Foundation of the Bogor Agricultural Institute. The school has grown and developed since 1986, and every year there is an increase in students at Kornita High School, this also greatly affects the increase in the number of motorcycle users, the high number of motorcycles in Kornita High School requires the availability of parking locations that accommodate motorcycle users at Kornita High School.

Therefore, the development of motorcycles is increasing, with the increasing number of vehicles, the availability of parking space and parking facility arrangements must be considered. Generally in the school area, the need for parking space is quite large considering that most students, teachers, and employees on average bring private vehicles. With the increasing number of vehicles in Kornita High School, an integrated arrangement must be carried out as a single transportation system in order to realize the availability of parking space to accommodate existing vehicles.

By providing a large and organized parking space in Kornita High School, so that the level of need for the number of vehicles can balance the need for parking space with the number of vehicles needed. In solving the problem, this study aims to determine the characteristics of parking, capacity and parking space needs that occur at this time. Based on the formulation of the problem above, the objectives of this study are: 1) to obtain the existing capacity of motorcycle parking at the Kornita High School Building parking location, 2) to obtain the characteristics of motorcycle parking

(parking volume, parking accumulation, parking duration, parking turnover Turn Over and parking index) at the Kornita High School Building.

Definition of Motorcycle

A motorcycle is a two-wheeled vehicle driven by an engine and the location of the two wheels is in a straight line. At high speeds, the motorcycle remains stable due to gyroscopic force, while at low speeds the stability or balance of the motorcycle depends on the control of the handlebars by the rider.

Motorcycles are a means of transportation that is often used by some people to travel to a place, either in and out of town or in remote places and motorcycles are the largest component in the movement of travel in traffic on public roads because motorcycles are a type of vehicle with low costs that can be owned by low-income groups and are considered practical and easier to break through traffic jams.

Motorcycle ownership is a driving force or strength that arises from within the community to provide easy mobility in achieving the desired goals. In an effort to own a motorcycle, there is a process carried out by the community, according to their economic capabilities. Operationally, motorcycle ownership is a response from low-income people to the desire in society to own a motorcycle, because the role of motorcycles is so important for the sustainability of their economy and they strive to achieve it.

Characteristics of Motorcycle Riders

The characteristics of motorcycle riders, gender affects the differences in activities carried out so that it causes differences in movement or travel patterns. The number of traffic accidents involving male riders as victims is higher than women. This is because female motorcyclists are fewer in number than male motorcyclists based on police report data [1]. Differences in gender characteristics can have an impact on driving. Men and women have different driving behaviors [2]. Age has an important influence on accidents, young people are more often involved in traffic accidents than older people. The Directorate General of Land Transportation shows that drivers aged 16-30 years are the biggest cause of traffic accidents [3], [4].

Based on the Law on Road Traffic and Transportation Number 22 of 2009, it states that a Driving License (SIM) is a letter or document used by motor vehicle drivers as a requirement for drivers to drive motor vehicles. Based on these provisions, children under the age of 17 are not allowed to drive motor vehicles because they are not old enough and have the potential to endanger other road users.

Definition of Parking

Parking is a non-moving vehicle, a vehicle that is temporary because it is left by the driver and stops for a while or long enough according to needs, the existence of parking activities causes the need for parking space and can be organized by the government or other parties in the form of individuals or business entities, parking facilities are built together to facilitate motor vehicles or not.

Included in the definition of parking that stops at certain places, whether stated by traffic signs or not, and not solely for the purpose of picking up and dropping off people or goods. Parking of vehicles on the road is done parallel or at an angle according to the direction of traffic, and regarding parking that is permitted in emergency conditions, drivers are required to install a safety triangle, hazard warning lights, or other signals. Parking facilities must be in a location that is easily accessible, safe, and comfortable.

Based on Parking Status

Guidelines for Parking Facility Providers are grouped into several parts:

a. Public Parking
   Public parking is a parking area that uses land that is controlled, and its management is organized by the local government.
b. Special Parking

Special parking is parking that uses land that is managed by a third party.

c. Emergency Parking

Emergency parking is parking in public places that uses land owned by the local government, or privately owned, which occurs due to incidental activities.

d. d. Parking Building

A parking building is a building used as a parking area whose management is controlled by the local government, or a third party, who has obtained permission from the local government.

e. Parking Area

Parking area is a building, or parking lot complete with the necessary parking facilities, and its management is controlled by the local government [1].

Parking Space Unit for Motorcycles

Parking Space Unit (SRP) is an effective area measurement for placing vehicles (passenger cars, buses/trucks, or motorcycles). The length and width of the parking space are adjusted to the size of the parked vehicle, the following is the parking space unit (SRP) for motorcycles shown in table 1 and figure 1 below.

Table 1. Determination of Parking Space Unit (SRP) for Motorcycles [1]

Vehicle type	Parking Space Unit (m^2)
Motorcycle	0,75 x 2,00
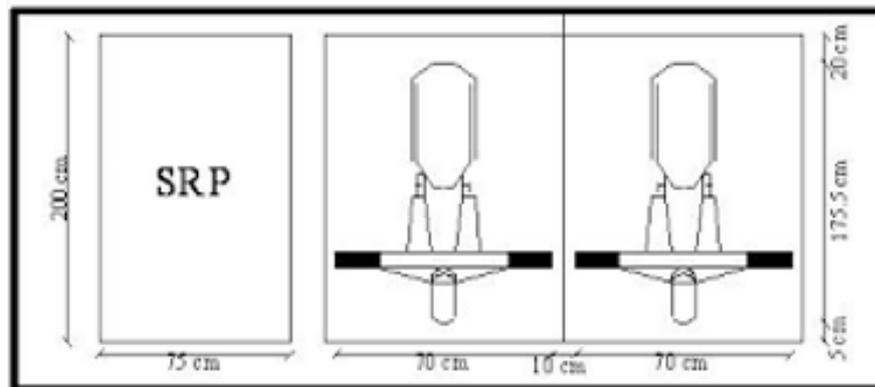
Figure 1. Parking Space Unit (SRP) for Motorcycles [1]

Motorcycle Parking Pattern

To implement a parking policy, it is necessary to first think about the parking pattern that will be applied. The parking pattern will be better if it is in accordance with existing conditions. The parking pattern used is 90°. The selection of this parking angle aims to make parking lot users feel safe and there are no obstacles in entering or exiting vehicles.

This parking pattern has a greater capacity compared to the parallel parking pattern, but for the convenience and comfort of drivers maneuvering in and out of vehicles will be more difficult compared to the parking angle pattern with a pattern smaller than 90°. The following is a 90° angle parking pattern.

This parking pattern is applied if the availability of space is sufficient and the movement of vehicle parking can be one-way and two-way, which is shown in Figure 2 below.
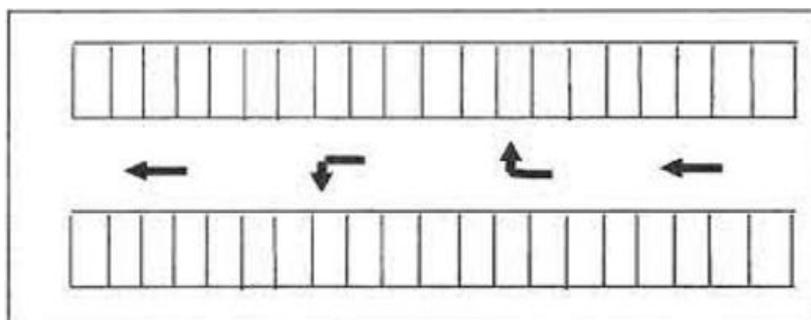
Figure 2. Two-Sided Parking Pattern with 90º Angle [1]

Parker movement space requirements

The need for parking vehicle movement space is influenced by:

1. The area of the parking equipment.
2. Circulation lane (a place used for the movement of vehicles entering and exiting the parking facility).
3. Parking space dimensions.
4. Alley lane (a lane between two adjacent rows of parking spaces).

The difference between circulation lanes and alley lanes lies mainly in their use. To facilitate the flow of parking circulation, an optimal alley lane width is needed, providing a limit on the width of the alley lane for two-wheeled vehicles which can be seen in table 2 below.

Table 2. Width of the alley lane for two-wheeled vehicles [1]

SRP	Alley width (m)	
	90º	
	One way	Second way
SRP sepeda motor (0.75 x 2)m	-	1,6 *
	-	1,6 **

Parking Facilities

Parking facilities are locations designated as temporary vehicle stops to carry out activities for a certain period of time, an area requires various facilities that can be used by the community to meet their life needs. Facilities can be interpreted as:

1. Buildings or open spaces.
2. A general term used to indicate an important element in government assets or the provision of services in general.
3. Networks or buildings that provide services with certain functions to the community or individuals in the form of convenience for the lives of the community and government.
4. Supporting community needs.

Parking Characteristics

In a parking activity, information will be obtained regarding some or all of the parking characteristics, and the characteristics that we can see include: Parking volume, parking accumulation, parking duration, parking turnover rate, parking index, parking average, parking capacity.
1. Parking Volume.
   Parking Volume = Ei + X…………………………………….…………………….. (1)
   Description:
   Ei = Entry (vehicles entering the location)
   X = Vehicles already parked during the survey period

If there are already vehicles parked at the survey location before observation, the number of existing vehicles is added to the total accumulation as in:

2. Parking Accumulation.

The parking accumulation value can be calculated using the formula:

$$\text{Accumulation} = Ei - Ex \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots \quad (2)$$

If before the research was conducted there were already vehicles parked at the survey location, then the number of existing vehicles is added to the accumulation that has been made, with the following equation formula 3:

$$\text{Accumulation} = Ei - Ex + X \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots \quad (3)$$

Description:

Ei = Entry (vehicles entering the location)

Ex = Exit (vehicles leaving the location)

X = Number of vehicles parked before observation

3. Parking Duration.

The parking duration value can be calculated using the formula:

$$D = (Nx.(X).(I))/Nt \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots \quad (4)$$

Description:

Nx = Number of vehicles in time interval X

X = Number of Intervals

I = Length of time for each interval (hours)

Nt = Total number of vehicles during the survey time

4. Parking Turnover.

The parking turn over value can be calculated using the formula:

$$\text{Parking Turnover} = (\text{Parking Volume})/(\text{Parking Capacity}) \dots\dots\dots\dots\dots\dots\dots \quad (5)$$

5. Parking Index.

The parking index value is obtained using the equation:

$$\text{Parking Index} = (\text{Parking Accumulation} \times 100\%)/(\text{Parking Capacity}) \dots\dots\dots\dots\dots \quad (6)$$

6. Basic parking analysis formula.

$$Z = (y \times D)/T \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots \quad (7)$$

Description:

Z = Required parking space (SRP)

y = Number of vehicles parked at one time

D = Average parking duration (hours)

T = Survey duration (hours)

Parking at schools and in public places is shaped by safety, accessibility, traffic flow, and community use patterns, often requiring more structure and regulation than parking in purely commercial settings. At schools, parking design and management are heavily influenced by the presence of children, peak-time congestion, and the need for clear separation between pedestrians and vehicles. In elementary and secondary schools, designated drop-off and pick-up zones are typically positioned close to main entrances to reduce the distance children must walk near traffic [5]-[7]. These zones often operate as short-term standing areas rather than traditional parking spaces, with strict time limits during morning arrival and afternoon dismissal. Staff parking is usually located in a separate lot to prevent conflicts between employee vehicles and parent traffic. Visitor parking spaces are commonly placed near administrative offices and clearly marked to ensure that guests do not interfere with bus lanes or student pathways. School bus circulation is a central consideration. Many campuses include a dedicated bus loop physically separated from parent drop-off lanes and student parking areas. This separation minimizes crossing conflicts and improves safety [8]-[10]. In high schools and some middle schools, student parking introduces additional complexity. Schools may issue parking permits, assign specific spaces, and enforce rules regarding speed, vehicle registration, and adherence to designated areas. Parking lots are often monitored by staff or security personnel, and signage is used extensively to reinforce one-way circulation patterns, fire lanes, and accessible parking spaces. Accessibility is a legal requirement, so spaces for individuals with disabilities are placed close to entrances and built to comply with national or regional standards [11], [13].

In public places such as parks, libraries, transit stations, shopping districts, and civic centers, parking must accommodate a broader and more varied population. The design depends heavily on the function of the facility. For example, facilities near major attractions like Central Park or large civic spaces such as Millennium Park often rely on a combination of surface lots, structured parking garages, and street parking to handle fluctuating demand. In dense urban areas like New York City, public parking frequently includes metered curbside spaces with time limits to encourage turnover, while garages may use hourly or daily pricing models that adjust based on demand [15], [16].

Public parking areas must also consider accessibility, pedestrian pathways, lighting, and security. Clear striping, signage, and marked crosswalks help guide both drivers and pedestrians. Lighting is particularly important in lots used during evening hours, such as those serving theaters, community centers, or transit hubs [17]-[19]. Surveillance cameras, emergency call stations, and regular patrols are sometimes implemented to enhance user safety. In addition, many municipalities designate specific parking spaces for electric vehicle charging, car-sharing programs, or bicycles, reflecting evolving transportation trends. Traffic flow management is another shared concern between schools and public venues. One-way aisles, clearly marked entrances and exits, speed bumps, and traffic-calming measures reduce collisions and protect pedestrians [20]. During special events, temporary staff or police officers may direct vehicles to prevent bottlenecks. Environmental considerations are increasingly incorporated, including permeable paving materials, landscaped islands for stormwater management, and shaded parking areas to reduce heat buildup [21], [22].

RESEARCH METHOD

The location of the research was conducted at Kornita High School, Bogor Agricultural University Jl. Tj. Babakan Campus, Dramaga District, Bogor Regency, West Java. The research was conducted within 3 months, starting from September 25, 2023 to November 27, 2023. The implementation time of this research was carried out for 2 weeks, in 1 week the research was conducted in 5 days, namely Monday to Friday at 06:00 - 16:00 WIB, the following is the research location shown in Figure 3.
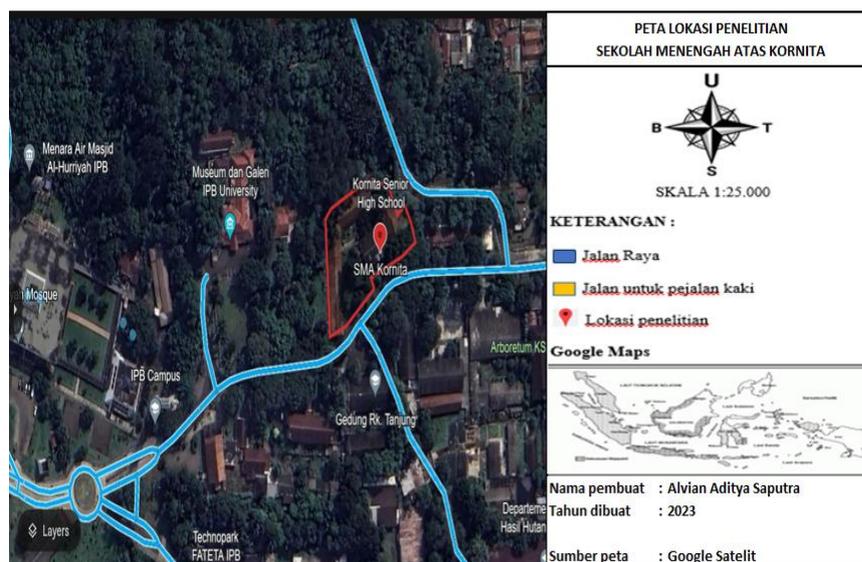
Figure 3. Research location (Source: Google satellite)

The following is the layout of the research location shown in Figure 3.
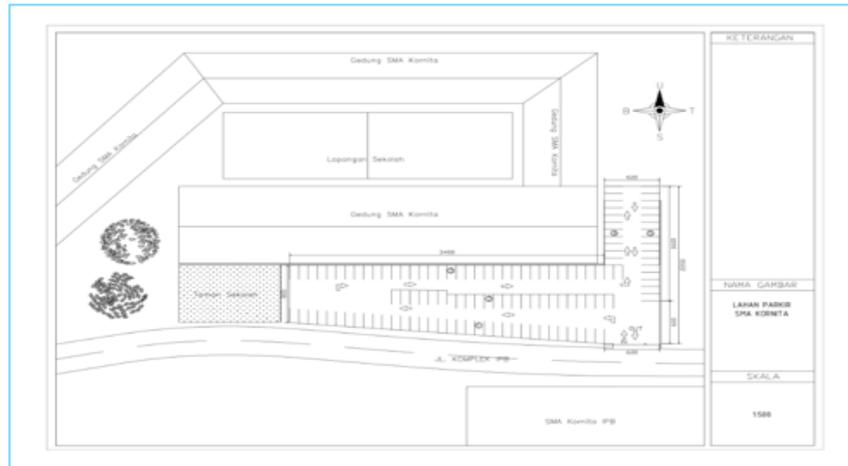
Figure 4. Layout of the research site

The following is a description of the existing conditions in the parking area of the Kornita High School Building:

1. Capacity No. 1 is 34 SRP
2. Capacity No. 2 is 24 SRP
3. Capacity No. 3 is 36 SRP
4. Capacity No. 4 is 11 SRP
5. Capacity No. 5 is 16 SRP

With a capacity of 121 SRP and a parking area of 455 m^2 in the Kornita High School Building, a two-sided parking pattern forms a 90° pattern.

The following is a research flow diagram shown in Figure 5 below.
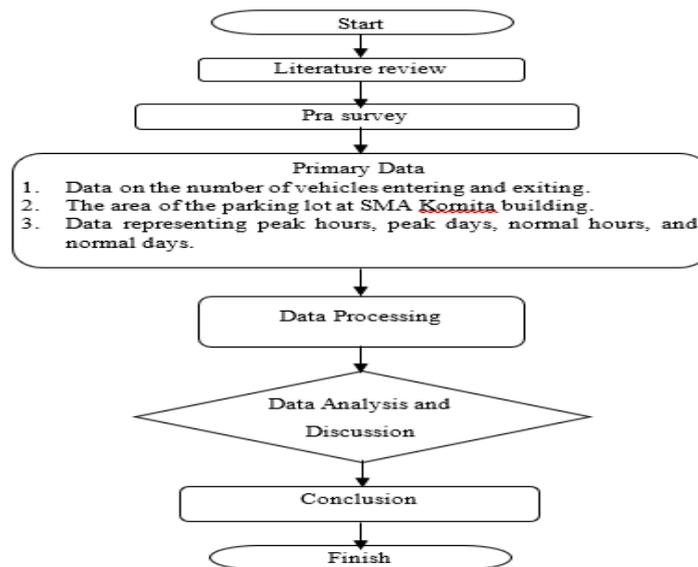
Figure 5. Research flowchart

RESULTS AND DISCUSSION
Parking area plan data

Existing parking conditions at the Kornita High School Building. Based on observations that have been made at the Kornita High School Building, the parking

needs at the Kornita High School Building are unable to accommodate vehicles that will park. The number of parking spaces for motorbikes is 121 SRP, so many motorbike users prefer to park close together without considering the distance and are not organized in the parking area. The existing parking conditions at the Kornita High School Building are in Figure 6 below.

Figure 6. Existing parking conditions at the Kornita High School Building.

a. Research data.

The research conducted at the Kornita High School Building began on September 25, 2023 to November 27, 2023, while the collection of vehicle volume data was carried out for 10 days, namely Monday, October 16, 2023 to Friday, October 27, 2023, the data obtained can be seen in Appendix III.

b. Research variables

In order to meet the need for parking space, there are several variables that can affect the need for parking space, including:

a) Number of vehicles

Based on the results of the study and the calculation of vehicle accumulation, it was found that the average number of motorcycles parked the highest on Monday at 09:15 - 09:30, amounting to 148 vehicles.

b) Parking area

The parking area at the Kornita High School Building is 455 m^2.

Recording vehicles when entering and exiting

a. Parking volume

Parking volume is the number of vehicles parked at the study location during a certain period of time, in this case the calculation is grouped every 15 minutes. By knowing the volume of parking vehicles from a parking facility, the amount of parking space needed can be determined to accommodate the volume of parking vehicles that occur. The greater the parking volume at the study location during 10 hours of observation as shown in Table 3 and Figure 7 below:

Table 3. Motorcycle parking volume

| No	Day/Date	Time	Number of Vehicles
1	Monday, October 16, 2023	06:00 - 16:00	144
2	Tuesday, October 17, 2023	06:00 - 16:00	139
3	Wednesday, October 18, 2023	06:00 - 16:00	128

No	Day/Date	Time	Number of Vehicles
4	Thursday, October 19, 2023	06:00 - 16:00	129
5	Friday, October 20, 2023	06:00 - 16:00	133
6	Monday, October 23, 2023	06:00 - 16:00	149
7	Tuesday, October 24, 2023	06:00 - 16:00	130
8	Wednesday, October 25, 2023	06:00 - 16:00	140
9	Thursday, October 26, 2023	06:00 - 16:00	128
10	Friday, October 27, 2023	06:00 - 16:00	138
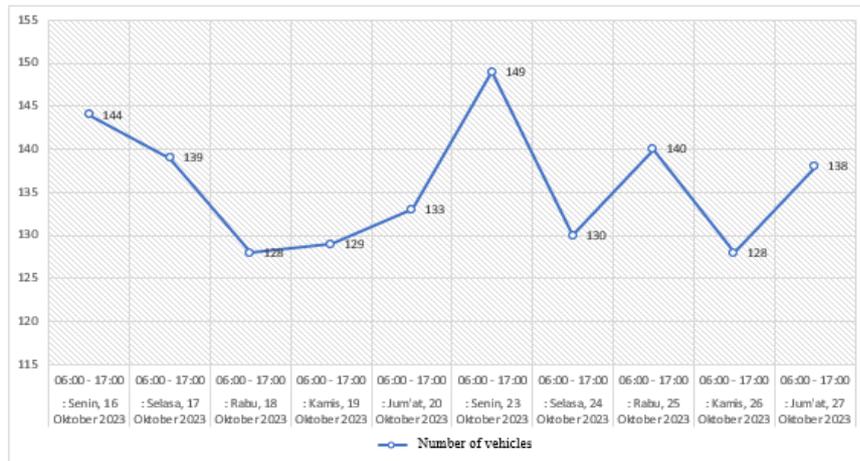
Figure 7. Motorcycle parking volume

a. Peak vehicle entry hour

The peak vehicle entry hour is the period of time when most drivers enter the parking area. In this case, the peak vehicle entry hour is grouped based on the largest number in a period per day as shown in Figure 8 below.
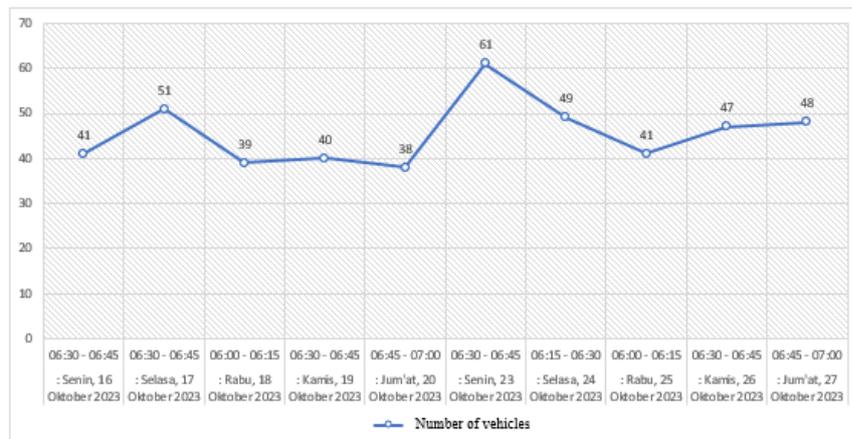
Figure 8. Peak vehicle entry hours

Based on Figure 8 above, it can be seen that the highest peak vehicle entry hour period occurred on Monday, October 23, 2023 with a total of 61 vehicles.

Peak vehicle exit hour

The peak vehicle exit hour is the period of time when drivers exit the parking area the most. In this case, the peak vehicle exit hour is grouped based on the largest number in a period per day as shown in Figure 9 below
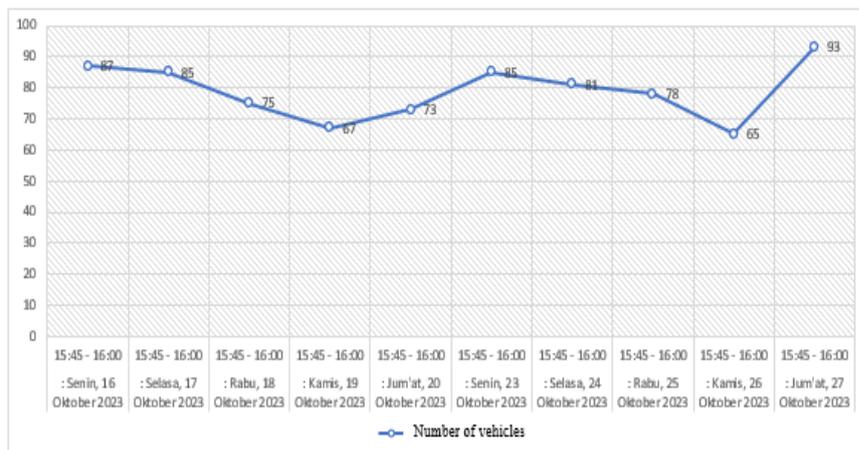
Figure 9. Peak vehicle exit hours

Based on Figure 9 above, it can be seen that the highest peak vehicle exit hour period was on Friday, October 27, 2023 with a total of 93 vehicles.

Parking accumulation

Parking accumulation is the number of vehicles parked in a place at a certain time and can be divided according to the category of type and purpose of travel. Peak parking time and the number of parked vehicles can be obtained from the results of parking accumulation. Data obtained for 10 days recorded the number of vehicles entering and leaving and then grouped into 15-minute time intervals, so that the percentage of vehicle distribution entering and leaving and parking accumulation figures were obtained. Based on the parking accumulation table and the number of motorcycles entering and leaving the Kornita High School building, the distribution of the number of vehicles for each 15-minute survey interval can be seen. The following is the maximum accumulation shown in Figure 10.
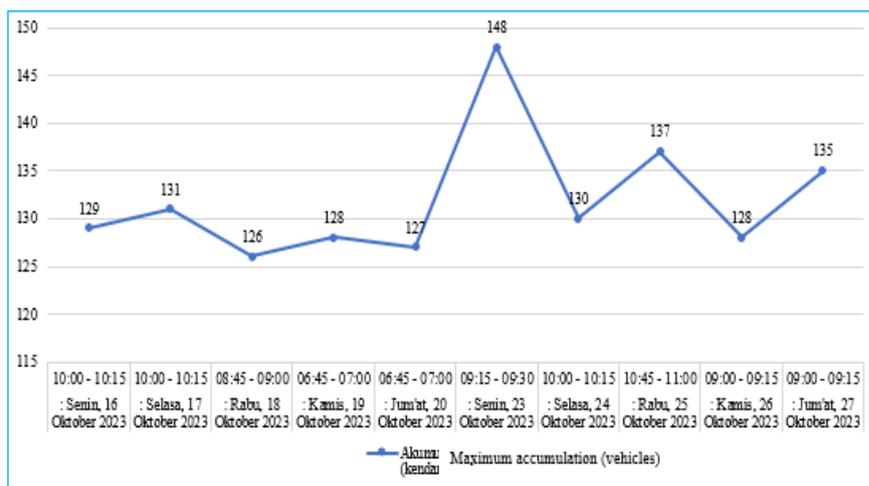

Figure 10. Maximum parking accumulation

1. The maximum number of motorcycles entering and exiting on Monday, October 16, 2023 can be seen in Figure 10 parking accumulation. The maximum number of motorcycles entering the parking lot was 41 vehicles (28.472%) occurring at 06:30 – 06:45. The maximum number of motorcycles exiting the parking lot was

87 vehicles (60.417%) occurring at 15:45 – 16:00. For the maximum parking accumulation with a total of 129 vehicles at 10:00 – 10:15.

2. The maximum number of motorcycles entering and exiting on Tuesday, October 17, 2023. The maximum number of motorcycles entering the parking lot was 51 vehicles (36.691%) occurring at 06:30 – 06:45. The maximum number of motorcycles leaving the parking lot was 85 vehicles (61.151%) occurring at 15:45 – 16:00. For the maximum parking accumulation with a total of 131 vehicles at 10:00 – 10:15.

3. The maximum number of motorcycles entering and leaving on Wednesday, October 18, 2023. The maximum number of motorcycles entering the parking lot was 39 vehicles (30.469%) occurring at 06:00 – 06:15. The maximum number of motorcycles leaving the parking lot was 75 vehicles (58.594%) occurring at 15:45 – 16:00. For the maximum parking accumulation with a total of 126 vehicles at 08:45 – 09:00.

4. The maximum number of motorcycles entering and exiting on Thursday, October 19, 2023. The maximum number of motorcycles entering the parking lot was 40 vehicles (31.008%) occurring at 06:30 – 06:45. The maximum number of motorcycles exiting the parking lot was 67 vehicles (51.938%) occurring at 15:45 – 16:00. For the maximum parking accumulation with a total of 128 vehicles at 06:45 – 07:00.

5. The maximum number of motorcycles entering and exiting on Friday, October 20, 2023. The maximum number of motorcycles entering the parking lot was 38 vehicles (28.571%) occurring at 06:45 – 07:00. The maximum number of motorcycles exiting the parking lot was 72 vehicles (54.135%) occurring at 15:45 – 16:00. For the maximum parking accumulation with a total of 127 vehicles at 06:45 – 07:00.

6. The maximum number of motorcycles entering and exiting on Monday, October 23, 2023. The maximum number of motorcycles entering the parking lot was 61 vehicles (40.940%) occurring at 06:30 – 06:45. The maximum number of motorcycles exiting the parking lot was 85 vehicles (57.047%) occurring at 15:45 – 16:00. For the maximum parking accumulation with a total of 148 vehicles at 09:15 – 09:30.

7. The maximum number of motorcycles entering and exiting on Tuesday, October 24, 2023. The maximum number of motorcycles entering the parking lot was 49 vehicles (37.692%) occurring at 06:15 – 06:30. The maximum number of motorcycles leaving the parking lot was 81 vehicles (62.308%) occurring at 15:45 – 16:00. For the maximum parking accumulation with a total of 130 vehicles at 10:00 – 10:15.

8. The maximum number of motorcycles entering and leaving on Wednesday, October 25, 2023. The maximum number of motorcycles entering the parking lot was 41 vehicles (29.286%) occurring at 06:00 – 06:15. The maximum number of motorcycles leaving the parking lot was 78 vehicles (55.714%) occurring at 15:45 – 16:00. For the maximum parking accumulation with a total of 137 vehicles at 10:45 – 11:00.

9. The maximum number of motorcycles entering and exiting on Thursday, October 26, 2023. The maximum number of motorcycles entering the parking lot was 47 vehicles (36.719%) occurring at 06:30 – 06:45. The maximum number of motorcycles exiting the parking lot was 65 vehicles (50.781%) occurring at 15:45 – 16:00. For the maximum parking accumulation with a total of 128 vehicles at 09:00 – 09:15.

10. The maximum number of motorcycles entering and exiting on Friday, October 27, 2023. The maximum number of motorcycles entering the parking lot was 48 vehicles (34.783%) occurring at 06:45 – 07:00. The maximum number of motorcycles exiting the parking lot was 93 vehicles (67.391%) occurring at

15:45 – 16:00. For the maximum parking accumulation with a total of 135 vehicles at 09:00 – 09:15.

Parking duration

Parking duration is the time span of a vehicle parked in a place (in hours). Based on the results of the study above, it was obtained that the average parking duration with a time interval of 15 minutes, as shown in Figure 11 as follows:
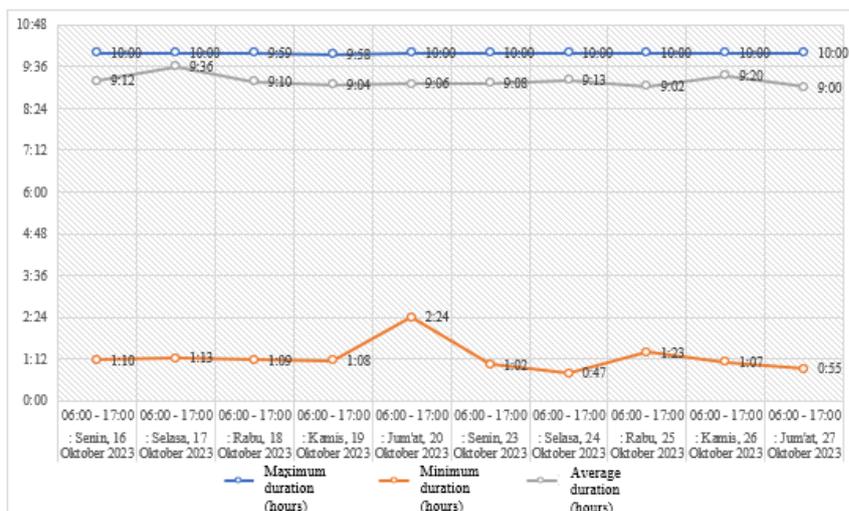

Figure 11. Parking duration

Based on Figure 11 above, the maximum duration is 10:00 hours. The average maximum duration occurs at 09:36 hours, and the minimum duration occurs at 0:47 hours.

Parking Turnover

Parking Turnover is the level of parking space usage and is obtained by dividing the parking volume by the number of parking spaces for a certain period. By knowing the parking turnover value, the level of parking space usage can be determined as shown in Figure 12 below:
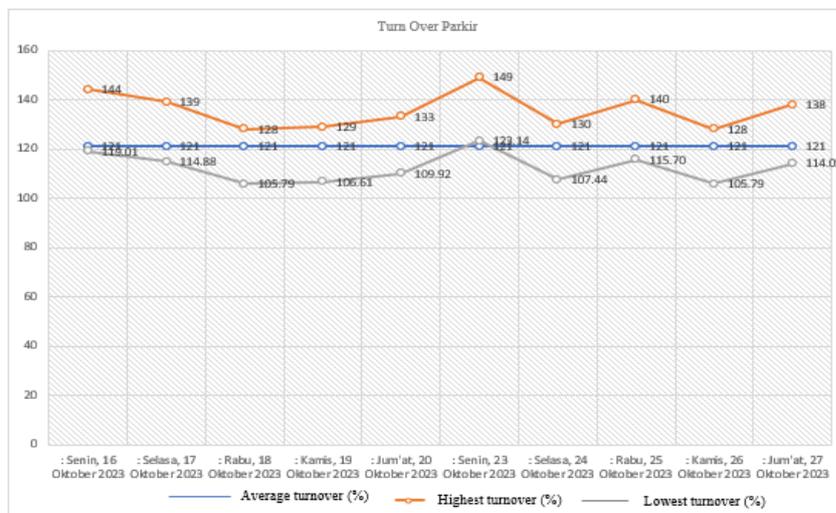

Gambar 12. Pergantian parkir (Turn Over)

Based on Figure 12 above, it can be seen that the highest motorcycle parking turnover rate is (123.14%), the average value is (112.23%) and the minimum value is (105.79%). This shows that the performance of motorcycle parking is quite high, exceeding 100%.

Parking index

Parking performance can also be seen based on the parking index number. The motorcycle parking index value at the Kornita High School Building which is based on the maximum parking accumulation is obtained. The parking index after going through the calculation stage is shown in Figure 13 as follows:
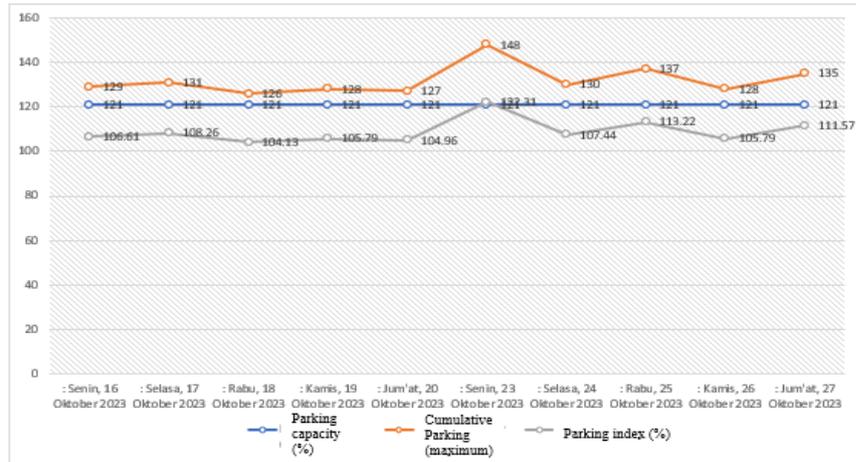

Figure 13. Parking index

Based on Figure 13 above, the motorcycle parking index that occurs at the maximum value is (122.31%), for the average value is (109.01%) and the minimum value is (104.13%) based on the maximum accumulation. From the parking index value obtained, it is stated that the demand for parking space is greater than the parking capacity because it has an index value of more than 100%.

Analysis of Parking Space Needs

Parking space needs

From the results of these calculations, a recapitulation of parking space needs at the Kornita High School Building is obtained as shown in Figure 14 as follows:
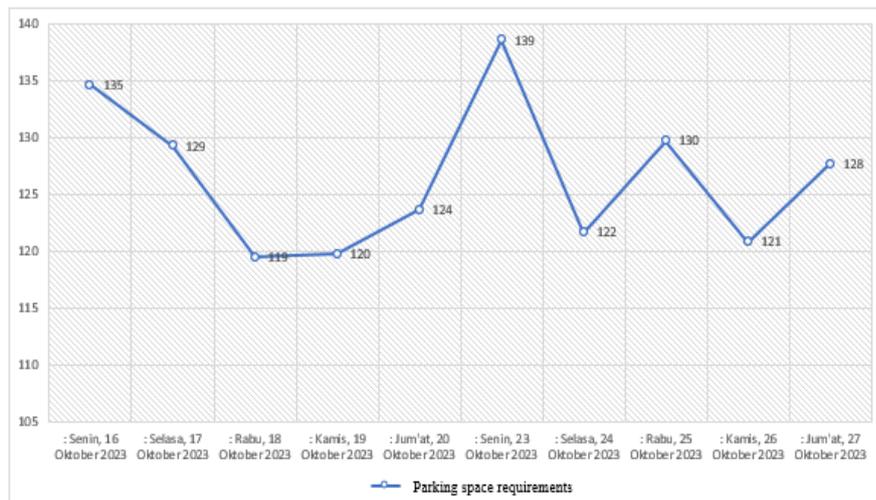
Figure 14. Parking space requirements

Based on Figure 14 above, it shows that the largest parking space requirement for motorbikes at the Kornita High School Building occurred on Monday, October 23, 2023, amounting to 139 SRP. 1. Parking space capacity requirement standards Based on the data analysis that has been carried out, the available parking capacity and parking space requirements can be determined by analyzing the number of vehicles parked against the number of parking spaces available. If the parking space requirement is greater than the available parking capacity, then the number of parking spaces available is insufficient. If the parking space requirement is smaller than the available parking capacity, then the number of parking spaces available is still able to accommodate vehicles that will park in the parking area. The largest parking space requirement is determined as the parking space requirement value that must be met by Kornita High School. If the parking space requirement is determined based on the results of research in the field, then the parking space requirement value taken is when the maximum accumulation occurs. The following is a comparison of parking space requirements to parking space capacity shown in Figure 15.
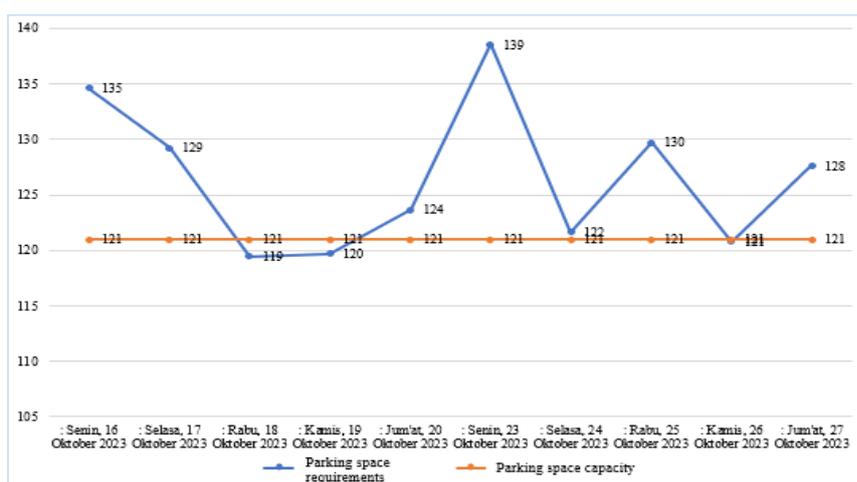
Figure 15. Parking space capacity requirements

Based on Figure 15, the parking space capacity requirement shows that on Monday, October 16, 2023, the parking space requirement is 135 SRP, while the parking capacity available at the research location is 121 SRP, so the difference between the parking space requirement and the parking capacity is -14 SRP.

Based on Figure 15, the parking space capacity requirement shows that on Tuesday, October 17, 2023, the parking space requirement is 129 SRP, while the parking capacity available at the research location is 121 SRP, so the difference between the parking space requirement and the parking capacity is -8 SRP.Based on Figure 15, the parking space capacity requirement shows that on Wednesday, October 18, 2023, the parking space requirement is 119 SRP, while the parking capacity available at the research location is 121 SRP, so the difference between the parking space requirement and the parking capacity is 2 SRP.Based on Figure 15, the parking space capacity requirement shows that on Thursday, October 19, 2023. The parking space requirement is 120 SRP, while the parking capacity available at the research location is 121 SRP, so the difference between the parking space requirement and the parking capacity is 1 SRP.

1. Based on Figure 15, the parking space capacity requirement shows that on Friday, October 20, 2023. The parking space requirement is 124 SRP, while the parking capacity available at the research location is 121 SRP, so the difference between the parking space requirement and the parking capacity is -3 SRP.

2. Based on Figure 15, the parking space capacity requirement shows that on Monday, October 23, 2023. The parking space requirement is 139 SRP, while the parking capacity available at the research location is 121 SRP, so the difference between the parking space requirement and the parking capacity is -18 SRP. 7) Based on Figure 15, the parking space capacity requirement shows that on Tuesday, October 24, 2023. The parking space requirement is 122 SRP, while the parking capacity available at the research location is 121 SRP, so the difference between the parking space requirement and the parking capacity is -1 SRP.

3. Based on Figure 15, the parking space capacity requirement shows that on Wednesday, October 25, 2023. The parking space requirement is 130 SRP, while the parking capacity available at the research location is 121 SRP, so the difference between the parking space requirement and the parking capacity is -9 SRP.

4. Based on Figure 15, the parking space capacity requirement shows that on Thursday, October 26, 2023. The parking space requirement is 121 SRP, while the parking capacity available at the research location is 121 SRP, so the difference between the parking space requirement and the parking capacity is 0 SRP.

5. Based on Figure 15, the parking space capacity requirement shows that on Friday, October 27, 2023. The parking space requirement is 128 SRP, while the parking capacity available at the research location is 121 SRP, so the difference between the parking space requirement and the parking capacity is -7 SRP.

Based on the explanation above, it shows that the parking space requirement value is greater than its static capacity, so the parking space requirement for static capacity requires additional space.

CONCLUSION

Based on the results of survey data conducted on the Bogor Agricultural University Campus parking space in the Kornita High School building for 10 (ten) days on Monday, October 16, 2023 to Friday, October 27, 2023, with a parking capacity provided for motorbikes at Kornita High School of 121 SRP with a parking area of 455 m2. Based on the data obtained from the maximum volume of motorcycle parking included in the parking load, namely the number of vehicles during a certain time period occurred on Monday, October 23, 2023, as many as 149 vehicles, with the maximum accumulated number of motorcycle parking vehicles parked during a certain time period occurring as many as 148 vehicles, with a maximum motorcycle parking duration span (in hours) of 10:00 hours. For the maximum average duration, it occurred at 09:36 hours, and for the minimum duration, it occurred at 0:47 minutes, with the highest motorcycle parking turn over in a certain time period reaching 123.14% and the motorcycle parking index is the percentage of the number of vehicles parked in the Kornita High School parking area, the highest reaching 122.31%, this shows that the motorcycle parking performance is quite high, this is indicated by seeing the parking index exceeding 100%. thus the parking capacity for motorcycles available is not sufficient to accommodate motorcycles in the Kornita High School parking lot.

REFERENCES

[1] DJPD. (1996). *Pedoman Teknis Penyelenggaraan Fasilitas Parkir*.

[2] Amirullah, W. (2021). *Analisis Kapasitas Parkir Kawasan Pasar Sudimampir (Studi Empiris Jalan Simpang Sudimampir I Samping Mesjid Noor Dan Samping Toko Orion Kota Banjarmasin)* (Doctoral Dissertation, Universitas Islam Kalimantan Mab).

[3] Anggraini, D., & Syaiful, S. (2020). Analisis Konsep Parkir Pada Plaza Ekalokasari Bogor. ASTONJADRO, 2(2), 9–18. https://doi.org/10.32832/astonjadro.v2i2.794

[4]   Arfianto, M. R. (2022). *Analisis Desain User Interface pada Aplikasi Pencari Parkir Mobil*. Desainpedia Journal of Urban Design, Lifestyle & Behaviour, 1(1).

[5]   Arianto, W. (2021). *Analisis Kebutuhan Ruang Parkir (Studi Kasus Pada Area Parkir Ict Universitas Teknokrat Indonesia)* (Vol. 02, Issue 02). http://jim.teknokrat.ac.id/index.php/tekniksipilJurnalTeknikSipil

[6]   Bambang Tripoli, Rahmat Djamaluddin, & Faisal Nas. (2019). *Analisis Karakteristik Parkir Kendaraan Bermotor*. *5*(2), 82–91.

[7]   Bertarina, B., & Arianto, W. (2021). Analisis Kebutuhan Ruang Parkir (Studi Kasus: Area Parkir Ict Universitas Teknokrat Indonesia). *Jurnal Teknik Sipil*, *2*(02), 67-77.

[8]   Diasa, W., Sumarda, G., & Septyana, A. A. G. A. (2019). *Evaluasi Kinerja Ruang Parkir Rumah Sakit Umum Pusat Sanglah Denpasar.* Jurnal Teknik Gradien, 11(2), 90-103.

[9]   Gustiaji, L., Herianto, D., & Hadi, Y. M. (2016). Studi Optimalisasi Perparkiran dan Pedestrian di Fakultas Teknik Jurusan Teknik Mesin, Teknik Elektro, Teknik Kimia dan Teknik Geofisika Universitas Lampung. Jurnal Rekayasa Sipil dan Desain, 4(1), 33-42.

[10]   Hendi Jaya, F., & Fermana, A. (2021). Analisis Kebutuhan Parkir pada Dinas Pengelolaan Sumber Daya Air Provinsi Lampung Analysis of Parking Needs at the Water Resources Management Office of Lampung Province. In *Jurnal Teknika Sains* (Vol. 06).

[11]   Kurniawan, S., & Sriharyani, L. (2020). *Analisis Kapasitas Ruang Parkir Kendaraan Kampus 1 Universitas Muhammadiyah Metro*. http://u.lipi.go.id/1320332466

[12]   Mansuetus Gare, Ireneus Kota, & Andreas Luis. (2023). Analisis Kapasitas Ruang Parkir Sepeda Motor PadaPelabuhan Ipi Ende. *Analisis Kapasitas Ruang Parkir Sepeda Motor PadaPelabuhan Ipi Ende*.

[13]   S Syaiful, Y Elvira. (2017). Case Study on Use Area Parking at New Market City Shopping Center Bogor. International Journal of Transportation And Infrastructure (IJTI) 1 (1), 34-40.

[14]   S Syaiful, H Prayoga, J Akbardin. (2020). Sustainable About the need of Parking Systems at the Mall RDS Bogor. ARPN Journal of Engineering and Applied Sciences 15 (22), 2620-2626.

[15]   S Syaiful, M Yuliantino. (2017). The Study of Land Parking Mall Bogor Indah Plaza. Global Research on Sustainable Transport (GROST 2017), 286-303.

[16]   S Syaiful, S Suherman. (2024). Performance Evaluation of Paid Parking at Cilebut Station. ASTONJADRO 13 (1), 12-22.

[17]   S Syaiful, T Murtejo, R Rulhendri, D Gunawan, AK Wardhani, DHM Lestari. (2025). Paid Parking Performance Evaluation at Depok Baru Station. ASTONJADRO 14 (1), 20-36.

[18]   FA Pratama, S Syaiful, RS Aminda. (2023). Paid Parking Performance at Depok Lama Station. ASTONJADRO 12 (3), 934-952.

[19]   S Syaiful, AM Zein, R Rulhendri, RS Aminda. (2023). Parking Analysis on Bogor Agricultural University Campus. ASTONJADRO 12 (3), 919-933.

[20]   S Syaiful, A Suparman, AK Wardhani. (2025). Analysis of Parking Lot Needs at Cibinong Regional General Hospital. ASTONJADRO 14 (2), 524-541.

[21]   S Syaiful, R Rulhendri, D Megawati, MR Rojudin, AK Wardhani. (2025). Parking Model in IPB University Campus Environment. ARPN Journal of Engineering and Applied Sciences 20 (5), 270-280.

[22]   S Syaiful, M Anggi. (2024). Evaluation Paid Performance on Station Bojonggede. ASTONJADRO 13 (2), 326-336.