EVALUATION OF PARKING SPACES AT THE CLEANERS

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ABSTRACT

Sudimampir market is a complete shopping center in the city of Banjarmasin. Along with its running time, the market sudimampir into a crowded shopping mall visited by people of Banjarmasin and its surroundings for a complete and cost. Most visitors come the shop sudimampir market with a wholesale count.

This research was conducted for analyzing the characteristics of the vehicle parked at the location of the study include: accumulation of parking, the average duration of parking, parking volume, the total number of its full vehicle parking ,and right parking corner. Data collection was performed manually during holidays. Based on the survey results, in getting Parking Penatu is often not operating optimally by not using the appropriate SRP SNI and still perform manual calculations in the counter. Performance Laundry Parking can run optimally if SRP SNI and using the angle of 30 °. So it can produce 67 pieces SRP and able to accept 313 units wheeled vehicles 4. With so, parking can operate properly by its function, namely as a parking area in the city center.

Keywords: Parking Area Laundry, Evaluation SRP, Volume Maximal Parking

PRELIMINARY

1.1   Background

Sudimampir market is a complete shopping center in the city of Banjarmasin. Over time, the market sudimampir into a crowded shopping mall visited by people of Banjarmasin and its surroundings for a complete and cost. Most visitors sudimampir market shopping with a count of bulk. Many visitors who use cargo vehicles, such as pick up and there was also a passenger car. With the increasing number of visitors to the market, this resulted in emerging constraints in terms of transport.

To meet the needs of the visitors do not disturb the market and highways, the government has made a special parking area 1 car load of passengers and cargo cars. Its location right on the ocean prince. Type of parking is in the form of off-street parking, or also called the parking lot, that takes a special area. This area is designed such that it becomes an ideal location as a parking lot. However, many visitors have rarely parked their vehicles on the land which is provided, in because of the remote parking location and sometimes full. Of course, this happens spur jams and traffic disrupted. Moreover, the location of the parking lot right on the roadside is often crowded.

Based on the above description, the authors were interested to know the characteristics of the vehicle parking. Including the accumulation of parking, parking volume, duration of parking, and parking index. To know the provision of parking spaces in the Market sudimampir. As this study to completion writing Final with the title: "EVALUATION OF PARKING SPACES AT THE CLEANERS."

1.2   Formulation of the problem

By a background that has been described, the issues raised by the authors want is the Force Space Center (SRP) and evaluate outflow Sign park on DRY.

1.3   Research purposes

The purpose of this research are:

1. Analyzing the characteristics of a vehicle parked in the study area include accumulation of parking, the average duration of parking, parking volume, turnover rate parking, parking constraints, a vehicle maneuver when parking, the total number of full parking lot ,and the park the vehicle right corner.

2. Im a reviewing parking characteristics to determine whether the parking space capacity can accommodate the parking of vehicles on weekdays and holidays.

1.4   Scope of the problem

Be aware of the extent of the problem in the arrangement of parking spaces that cover many aspects, then in the preparation of this thesis evaluates only Force Space Center (SRP).

1.5   Benefits of Research

This study was to investigate the characteristics used in the market parking sudimampir. This is very important to overcome the problem of parking characteristics that are often filled to result in illegal parking going on. Also, find out the capacity of parking of vehicles and right parking corner.

LITERATURE REVIEW

2.1   Parking

Parking is not moving the vehicle condition is not temporary or does not stop. The stop is the state of a vehicle stopped for a while ,and the driver did not leave the vehicle.

The need for parking for private vehicles, public transportation vehicles, motorcycles, or trucks are very important. These needs are very different and varied. Depending on the shape and characteristics of each vehicle design and location of parking.

2.2   characteristics Of Parking

Parking characteristics are parameters that affect the utilization of parking space. Through the unknown characteristics can park parking conditions that occurred in the study area. To determine the characteristics of the park should be known in advance is (Mariani, 2010).

2.2.1   Parking Accumulations

Accumulation is the number of vehicles parking within a period of accumulation is tertentu.Satuan vehicle.

Accumulation = Qin-Qout + QS .... (1)

Information :

Q in   = Σ vehicles entering the parking location

Q out   = Σ outgoing vehicle parking location

Q S   = Σ vehicles that have been in the parking area before the observations were made.

2.2.2 Length Of Parking

Parking duration is information that is needed to determine the length of a parked vehicle. This information is determined by observing the time the vehicle is entered and the time the vehicle is out.

Length = tout- tin .... (2)

Information :

tout   = Time when the vehicle enters the

parking location tin   = Time when the vehicle out

2.2.3 Volume Of parking

Volume is the number of vehicles parked specified intervals.

2.2.4 Substitution level parking

The parking turnover rate is the amount of use of parking spaces ,and parking is obtained by dividing the volume by the number of parking spaces for a specific period. The amount of parking turnover is derived from the equation:

$$\text{Turnover level pizzeria} = \frac{\textit{Volume Parkir}}{\textit{petak parkir tersedia}} \quad \text{...............................} (3)$$

2.2.5 Parking Index

The parking index is the percentage of the accumulated number of vehicles at certain intervals divided by the available parking space and then multiplied by 100%.

$$IP = \frac{\textit{Akumulasi}}{\textit{petak parkir tersedia}} \; x \; 100\% \quad \text{.......................................} (4)$$

2.4   Unit Space Center

According to the Guidelines for Planning and Operation of parking facilities by the Directorate General of Land Transportation (1998). Parking space (SRP) is a measure of the effective area to put vehicles (passenger cars, buses/trucks, or motorcycles), including free space and a wide-open door. To determine the parking space (SRP) based on the following considerations:

A. Vehicle Dimensions Standards for Passenger Cars.

B. Free vehicle parking space.

C. Vehicle Door aperture width.

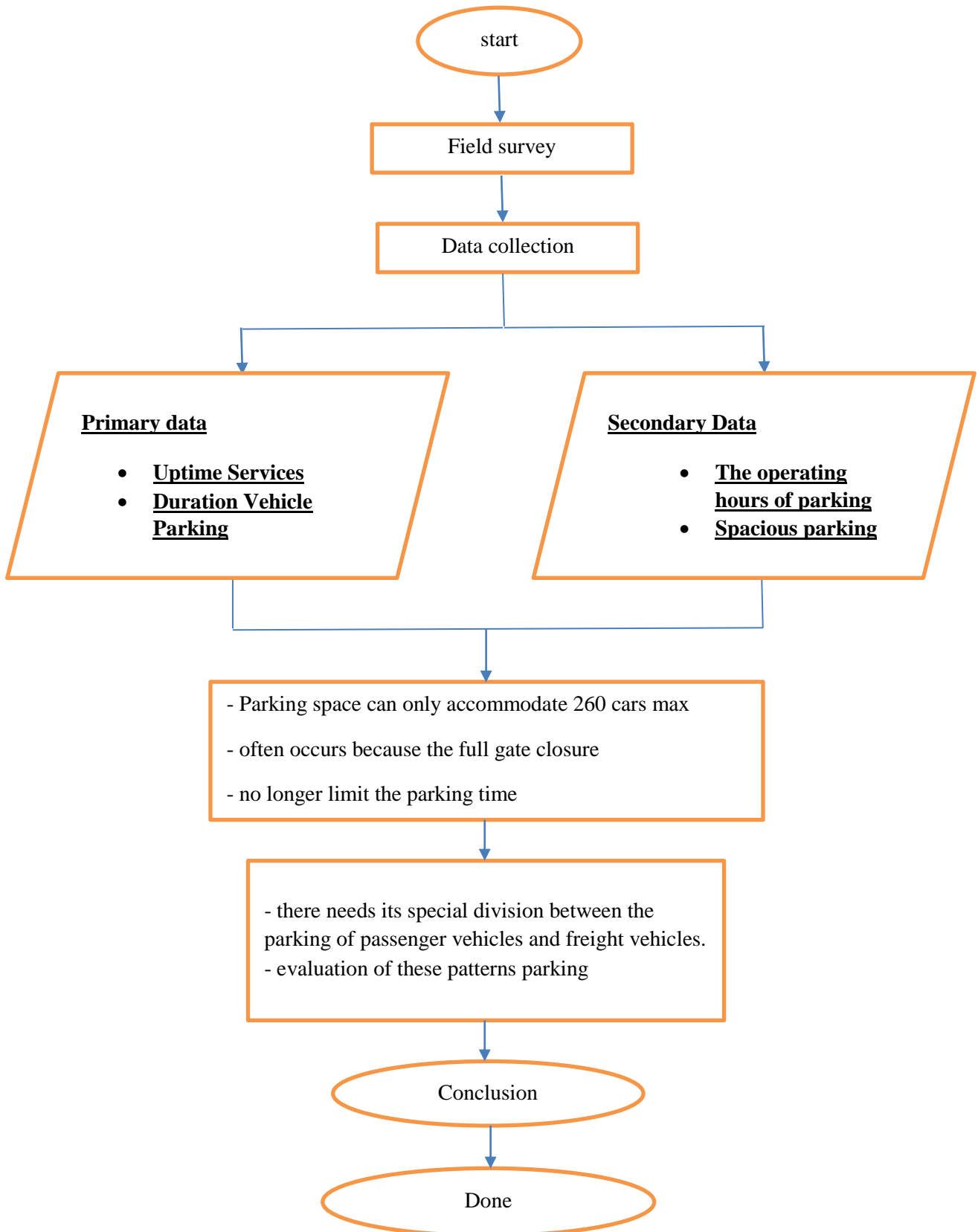D. Determination Unit Space Center.

RESEARCH METHODOLOGY

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                  │  Field survey │
                  └───────────────┘
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                  ┌───────────────┐
                  │Data collection│
                  └───────────────┘
```

Primary data

- **Uptime Services**
- **Duration Vehicle Parking**

Secondary Data

- **The operating hours of parking**
- **Spacious parking**

- Parking space can only accommodate 260 cars max

- often occurs because the full gate closure

- no longer limit the parking time

- there needs its special division between the parking of passenger vehicles and freight vehicles.
- evaluation of these patterns parking

Conclusion

Done

Figure 3.1 Flowchart Top Design

RESULTS AND DISCUSSION

4.1 Characteristics Parking

Based on the research that has been conducted on the parking area dry cleaners, the data obtained as follows:
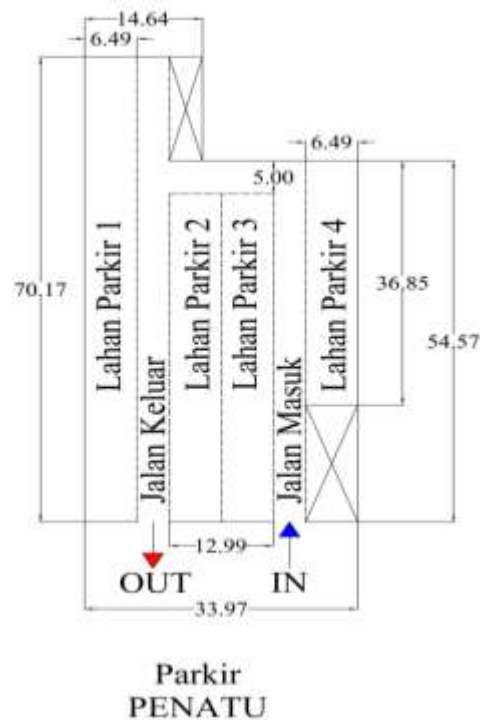
4.1.1 Area Data Center

Figure 4.1 Location Map Laundry Parking

The parking lot has an area of 1338.48 m2 cleaners. This location is only used for 4-wheel vehicles parked passenger and goods. By using a 30o angle, parking space Units are only able to accommodate 67 4-wheel vehicles if full. The figure above shows that the direction of the site plan entry and exit parking area used for parking. The area of each of its SRP is 2.5 x 5 m. SRP in use in the field is smaller in comparison with SRP Standart. Due to the 1338.48 m2 area, To be able to produce 67 pieces ,SRP SRP is smaller than the standard SRP. Sometimes so this field SRP problem is its narrow distance open the door of each car that sometimes makes it difficult to unload.

4.1.2 The volume of accumulated parking and parking

Characteristics parking volume obtained from direct data collection in the field is in though and can be seen in the image provided.

Table 4.1 Table Volume per Hour Parking and Duration Service Average - Average

Duration	volume parking	Service Time Average - Average (Seconds)
10:00 to 11:00 a.m.	45	8
11:00 to 12:00	75	15
12:00 to 13:00	60	10
1:00 p.m. to 2:00 p.m.	50	12
14:00 to 15:00	59	18
3:00 p.m. to 4:00 p.m.	24	11

The above table is a data volume of the total amount of vehicles parked in the can of duration per hour. So also in the can right the average service time in seconds when the 4-wheel vehicles will exit through the ticket office.
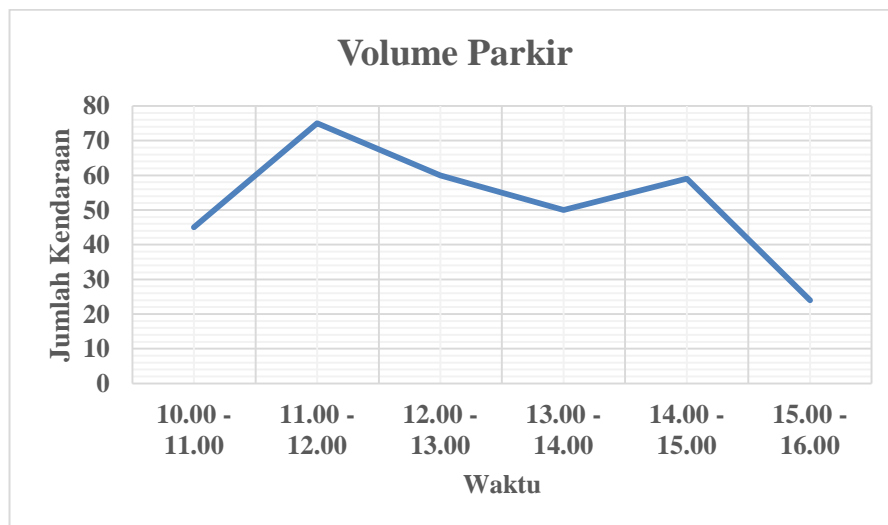

Figure 4.2 Chart Volume parking

The picture above is the percentage of time hourly chart 4-wheeled vehicles are parked at the weekend. can know the total volume of vehicles per hour parking lot full with SRP angle of 30 °, total full vehicle in at 11:00 to 12:00. at that time also became the oldest park and the longest time average vehicle parked. Thus resulting in some denial of the vehicle to be parked. Total vehicles entering at the weekend there were 313 units. Meanwhile, when an ordinary day, enough to accommodate the parking.

No crowds peak at 11:00 to 12:00 o'clock. there are approximately 8 vehicles were rejected.

4.1.3 Hours of Service

There is also time data service. The service time is the time in which the 4-wheel vehicles that are going out have to pay parking fees. Here recount how long on average are in need of a vehicle while in the exit. Calculated starting from the vehicle owner handed Tickets park entrance, to the exit door. The goal is that knowing how the time in 4-wheel vehicles needs to pay at the counter.

Table 4.2 Hours of Service

duration	volume parking	Service Time Average – Average (Seconds)
10:00 to 11:00 a.m.	45	8
11:00 to 12:00	75	15
12:00 to 13:00	60	10
1:00 p.m. to 2:00 p.m.	50	12
14:00 to 15:00	59	18
3:00 p.m. to 4:00 p.m.	24	11

From the table above, are known to the average service time that is required when the 4-wheel vehicles will pay the parking rate is 14 seconds.

Can be seen, the longest service time from 14:00 to 15:00 is 18 seconds. Because many visitors return, and the line at the exit rather full. Average time is fairly quite long, because the operating system is stil a manual ticket booth. So sometimes caused delays in the exit.

4.2 Data Optimization

This section will be described in detail some of the parts needed for the optimization of the data. Optimization of this data is to determine the advantages and disadvantages of the parking location and then optimized according to the capacity.

4.2.1 Unit Space Center (SRP)

Table 4.3 Capacity of SRP for each - each parking system configuration

duration	volume parking	Capacity				
		0 °	30 °	45 °	60 °	90 °
		58	67	54	38	34
10:00 to 11:00 a.m.	45	13	22	9	-7	-11
11:00 to 12:00	75	-17	-8	-21	-37	-41
12:00 to 13:00	60	-2	7	-6	-22	-26
1:00 p.m. to 2:00 p.m.	50	8	17	4	-12	-16
14:00 to 15:00	59	-1	8	-5	-21	-25
3:00 p.m. to 4:00 p.m.	24	34	43	30	14	10

Information: -. Value (-) means that the number of vehicles was rejected because it exceeds

parking capacity.

-.Nilai (+) means the amount of empty space that is unused because

parking space capacity has not reached a maximum.

From the above table obtained volume vehicle parking with a capacity of each corner of its SRP within the time duration per hour.

4.3. Parking Space Unit Results

Once describe items every corner, it can be concluded that a more efficient angle to accommodate the 4-wheel vehicles were parked and the vehicle is able to resist a bit of an angle of 30 °. Compared to the other corner of the SRP, the SRP is able to accommodate a maximum of 67 vehicles. SRP condition such as this is needed for creating a more effective parking conditions.

4.4 The entrance and exit

As we know, the parking service starts from the car park entrance. And on-site parking own cleaners are experiencing delays or congestion at the exit. Therefore, the number of parking gates has a considerable influence on the quality of service. If the door is provided too little compared to the incoming flow of vehicles, it can be sure there will be a long queue at the exit. So it takes quite a long service.

In the field, to create conditions in the form of single-channel queue structure single-phase and queue discipline first come - first served, then exit and entrance wearing portal type of lift (lifting barrier-arm) which can be driven by a machine or manually, if at any -time damage occurs. But not with the parking entrance cleaners are still manual. Do not use automatic doors. That sometimes resulted in delays in the exit.

In addition, to not use automatic doors, dry parking cleaners still use manual payments using the ticket. ie only by submitting a ticket, and then calculated how long divided by hour parking sign. The importance of how much should be paid by the applicable rates.

4.5 Optimization Exits

Because of the delay in the parking locations are more prevalent in the user exits, then the calculation will be done before the data.

There are several parameters that are taken into account when planning the queue parking gate operations, which are:

- the number of vehicles arriving per unit time (λ),

- the level of service per unit time (μ),

- traffic intensity (ρ),

- the average queue length (q), and

- Average wait time (w).

Here is the calculation result of observation on the door of the cleaners of parking services:

Is known:

- old Observations   =   At 10:00 to 16:00 (6 hours)

- number vehicle entering   =   313 units

- Old Average Service   =   12.3 second = 0.0034 hours

❖ Calculation:

➢ The number of vehicles arriving per unit time:

$$\lambda = \frac{number\ vehicle\ entering}{duration\ of\ observations} = \frac{313}{6} = 52{,}167\ veicle/hour$$

➢ Service level one door unity of time:

$$\mu = \frac{number\ vehicle\ entering}{average\ service\ time} = \frac{1}{0{,}0034} = 291{,}892\ veicle/hour$$

try:

By one entrance (single service)

n = number of parking gate = 1

$$\rho = \frac{\lambda}{n * \mu}$$

$$\rho = \frac{52{,}167}{1 \times 291{,}892} = 0{,}179$$

❖ intensity:

Because ρ < 1, means indicate that the arrival rate is less than the level of service, so that the entrance is able to serve the flow of vehicles to be parked.

There is a possibility of her right n the vehicle in the system:

$$p(n) = \left[\frac{\lambda}{\mu}\right]^{x}\left[1 - \frac{\lambda}{\mu}\right] = \rho^{x}[1 - \rho]$$

If for the n = 0 in the system

$$\rho\,(0) = \left[\frac{52,167}{291,892}\right]^0 \left[1 - \frac{52,167}{291,892}\right] = 0,179^0 \times (1 - 0,179) = 0,821$$

➤   The average queue length:

$$q = \frac{\rho^2}{1 - \rho} = \frac{0,179^2}{1 - 0,179} = 0,039 \; vehicle \; \approx 1 \; vehicle$$

➤   Wait time in queue:

$$w = \frac{\lambda}{\mu(\mu - \lambda)} = \frac{52,167}{291,892 \, (291,892 - 52,167)} = 0,00075 \; hour$$

$$w = 0,00075 \times 3600 = 2,68 \; second,$$

When the 4-wheel vehicles will exit through the exit door at the counter, in the can 1 piece of the vehicle must stop for 2.68 seconds.

❖   Calculation:

➤   The number of vehicles during rush hour:

$$\lambda = \frac{number \; vehicle \; entering}{duration \; of \; observations} = \frac{75}{1} = 75 \; veicle/hour$$

based on survey data, when the holidays many people come to the market to shop sudimampir. And cleaners also experience the fullness of the rather long. In the know, there are 75 vehicles entered in the first hour.

➤   The level of service one door per unit time:

$$\mu = \frac{number \; vehicle \; entering}{average \; service \; time} = \frac{1}{0,0034} = 291,892 \; veicle/hour$$

try:

By 1 entrance (single service)

n = number of parking gate = 1

$$\rho = \frac{\lambda}{n * \mu}$$

$$\rho = \frac{75}{1 \times 291,892} = 0,257$$

❖   intensity:

Because ρ <1, means indicate that the arrival rate is less than the level of service, so that the entrance is able to serve the flow of vehicles to be parked.

There is a possibility of her right n the vehicle in the system:

$$p(n) = \left[\frac{\lambda}{\mu}\right]^{x}\left[1-\frac{\lambda}{\mu}\right] = \rho^{x}\left[1-\rho\right]$$

➤ If for the n = 0 in the system

$$\rho\ (0) = \left[\frac{75}{291,892}\right]^{0}\left[1-\frac{75}{291,892}\right] = 0,257^{0} \times (1-0.257) = 0,743$$

➤ The average queue length:

$$q = \frac{\rho^{2}}{1-\rho} = \frac{0,257^{2}}{1-0,257} = 0,089\ vehicle\ \approx 1\ vehicle$$

➤ Wait time in queue:

$$w = \frac{\lambda}{\mu(\mu-\lambda)} = \frac{75}{291,892\ (291,892-75)} = 0,001185\ hour$$

$$w = 0,001185 \times 3600 = 4,266\ seconds,$$

❖ Intensity:

Because ρ < 1, at the time of the densest in the number of vehicles, there are 75 pieces of vehicles. It does not require the addition of parking entrance.

CONCLUSIONS AND RECOMMENDATIONS

5.1 Conclusion

Based on the analysis of the parking area in the Laundry which has been in the can, it can take the following conclusions:

5.1.1 Characteristics of parking

a) The parking lot has an area of 1338.48 m2 cleaners.

b) 4-wheel parking space wears a 30 ° angle, with its car parking spaces by 67 spaces.

c) 4-wheel parking capacity at this time there were 67 plots. Judging from the data in the parking lot Sunday, the total number of

vehicles parked there were as many as 313 units. can say the parking lot was not able to accommodate more vehicle wheel 4 again.

5.1.2 Parking space requirements

a) The motorcycle parking space requirement is less more 90 4 minutes during holidays.

b) Its full peak time 4-wheel vehicles in Sunday the parking lot when the clock 11:00 to 12:00.

c) Average in need of each car to back park the car is approximately 2 minutes.

d) The service time that is required to pay at the counter of the vehicle when parking is 14-20 seconds.

e) When hours parking was full, there were about 6-8 cars on the starting sign for parking.

f) The operating system has a parking lot for 1 hour rest period each of its day. Ie in hours of 12:00 to 13:00. so that the entrance in the lid for 1 hour. And vehicles that can not fit, had to find another parking area.

5.1.3 shortage of parking

a) Not in her provide a special place distabillitas

b) HR Employees less on each side of the corner location.

c) The pattern of the vehicle to the parking tends to be slow.

d) Because of SRP narrow distance, vehicle load and unload difficulties and slow down the flow of vehicles going out or going to the parking lot.

e) Ticket booth entrance and exit are still manual.

5.2   SUGGESTION

a) It required current changes from the parking lot entrance when going mem park the car. Based on the survey, the current parking lot has only one straight direction that tends to hours and slow. And sometimes

when the car you want out of the parking need by the way backward to get out.

b) Adding a special place with distabilities would be more helpful.

c) With an area of 1338.48 m2, parking lot can accommodate more than 150 vehicles per day 4-wheel her. Because not all SRP angles of 30 °, but there also are perpendicular, so that its position is not the same.

d) Parking lot cleaners should perform additional parking servants in order to facilitate the process of 4-wheeled vehicles when going to the park or get out. Because of occupying it, managers must possess a parking attendant in each of his sides to make it faster. And also so the parking attendant can alternate without closing the park during recess.

e) Parking his party must also be firm with five street vendors who trade in the parking lot because it is very disrupting the flow of street parking.

f) Needed expansion to accommodate more parking capacity during peak hours.

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