

# Road Quality Analysis on the Simpang Parit Rampak – Simpang PT. Mos Road Section Based on Road Serviceability Assessment Using Star Rating

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**Abstract:** This study aims to evaluate the road quality on the Simpang Parit Rampak – Simpang PT. Mos section through a roadworthiness test approach with a star rating. The roadworthiness test is a strategic method in infrastructure maintenance and improvement that assesses the physical aspects, safety, accessibility, and comfort of the road. This road is used for access to the Roro port and for the traffic of Karimun Power Plant (KPP) and PT. Mos employees. This road also connects several areas and is an important route for population mobility and goods distribution. The methodology refers to the Bina Marga approach and incorporates Star Rating-based feasibility testing in accordance with key technical regulations, including Ministry of Public Works Regulation No. 11/PRT/M/2010 on procedures and requirements for road feasibility; Environmental and Road Safety Guidelines No. 06/P/BM/2024 on Technical Instructions for Star Rating-based Feasibility Testing; and Construction Guidelines Pd T-09-2004-B for managing accident-prone locations. The results of this study analyze the condition of the road surface layer on pothole damage, transverse crack damage, patch damage and longitudinal crack damage. on the Simpang Parit Rampak – Simpang PT. Mos road section along 4,280 meters with the calculation of the Priority Order Value is 11 and is still functional and this road is recommended to be included in the Routine Maintenance Program. The results of the accident characteristic analysis with the 5W + 1H approach show that Who (road users involved) is a motorcycle vehicle that is most often involved in accidents, When (time of incident) the highest occurs at 16.00–19.00, Why (cause of accident) is the lack of anticipation and concentration of the driver, What (type of collision) front-rear collision dominates the type of accident, Where (Location of Accident) mostly occurs at STA 2 + 000–3 + 000 in the direction of Simpang Parit Rampak, How (type of vehicle movement) with dominant maneuvers in the form of vehicles moving straight, this road is recommended to add traffic signs and provide driving safety education through banners and social media. The results of the roadworthiness test with a Star rating on Segment 1 are categorized as 3 Stars (orange color) which indicates a sufficient level of safety, while Segment 2 is in the 4 Star category (yellow color), indicating a higher level of safety (safer road), it is recommended that segment 1 needs to be improved again and segment 2 should be maintained with regular maintenance and safety monitoring.

**Keywords:** Accident Characteristics, Feasibility Test, Star Rating

## Introduction

In the context of road maintenance and infrastructure improvement, the roadworthiness test has become an important method for evaluating the condition and performance of roads. One increasingly common approach to assessing road quality is the star rating system. The star rating provides a structured framework for evaluating various aspects of road quality, including physical condition, safety, accessibility, and comfort.

In this study, the research aims to analyze the road quality on the Simpang Parit Rampak – Simpang PT. Mos road section based on the roadworthiness test using the star rating method. This road section was selected because it serves as one of the vital routes in the local transportation network. It provides access to the Roro Port and is frequently used by employees of Karimun Power Plant (KPP) and PT. Mos. Additionally, this road connects several areas and serves as an important route for the mobility of residents and the distribution of goods.

Through the Bina Marga method and the roadworthiness test using the star rating system, this study aims to identify and evaluate various aspects of road quality, including the physical condition of the road surface, traffic congestion, the availability of safety facilities, and other factors that may affect the road users' experience.

This study is based on the Regulation of the Minister of Public Works No. 11/PRT/M/2010 concerning Procedures and Requirements for Roadworthiness, the Construction and Building Guidelines of the Department of Human Settlements and Regional Infrastructure Pd T-09-2004-B on the Handling of Traffic Accident-Prone Locations, the Regulation of the Minister of Public Works and Housing (PUPR) No. 11/P/BM/2024 concerning the Road Traffic and Transportation Safety Action Plan, and the PUPR Ministry DJBM Guideline No. 06/P/BM/2024 on Technical Instructions for Roadworthiness Tests Using the Star Rating System.

Therefore, it is necessary to conduct a study on the analysis of road quality on the Simpang Parit Rampak – Simpang PT. Mos road section based on the roadworthiness test using the star rating system. This research is expected to provide a deeper understanding of the condition of the road and to offer useful information for relevant stakeholders, including local governments, traffic regulatory bodies, and the general public, to support planning and decision-making related to road infrastructure maintenance and improvement in the area.

## **Methodology**

The Bina Marga method and the star rating system were chosen as the research approaches due to their ability to provide a comprehensive understanding of road conditions and a solid foundation for decision-making in road infrastructure planning and management. Through this analysis, the study will evaluate various aspects of road quality, including physical condition, traffic safety, and accessibility, as well as identify areas that require special attention for maintenance and improvement. The research methodology includes comprehensive field data collection, such as road condition surveys, traffic observations, and related statistical analyses. In this study, data collection techniques involve gathering primary data, which refers to authentic data obtained directly from field observations or the research object, and secondary data, which are obtained from relevant and appropriate reference books or guidelines related to the research problem. This study will focus on the road section between Simpang Parit Rampak and Simpang PT. Mos in Karimun Regency, Riau Islands Province.

## **Result And Discussion**

### **Condition Of Road Surface Layer**

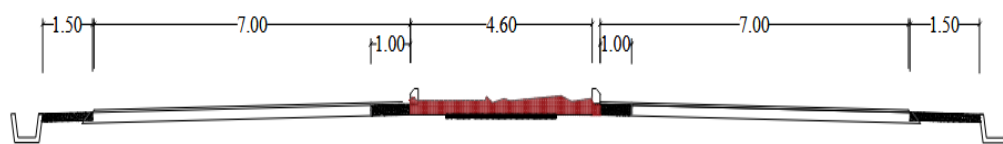
The road damage assessment was conducted on several segments along the road. The recorded damage data show that in the area of STA 2+500 to STA 2+600, the first segment experienced pothole damage and transverse cracking. The next damage was found in the

area of STA 3+450 to STA 3+550, where the second segment showed patching damage and longitudinal cracking.

The cross-section drawings of the road at STA 2+500 – STA 2+600 and STA 3+450 – STA 3+550 illustrate the condition of the road structure in these damaged areas.



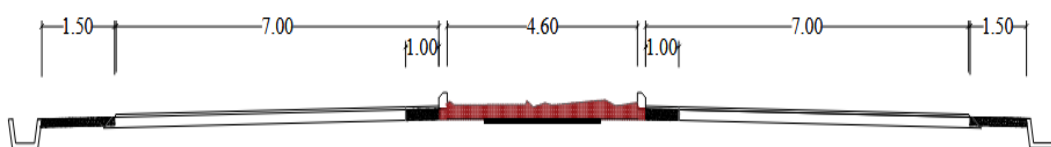
**Figure 1.** Road Damage Measurement at STA 2+500 – STA 2+600



**Figure 2.** Cross Section STA 2+500 – STA 2+600



**Figure 3.** Road Damage Measurement at STA 3+450 – STA 3+550



**Figure 4.** Cross Section STA 3+450 – STA 3+550

## 1. Segment 1 Area STA 2+500 s/d STA 2+600

### a. Pothole Damage

There is a pothole with a length of 1 meter and a width of 0.6 meters, resulting in a total damaged area of 0.6 m<sup>2</sup>. The percentage of pothole damage to the total segment area at STA 2+500 – STA 2+600 is calculated using Equation 3.3, where the damaged area is divided by the segment area and multiplied by 100. The resulting damage percentage is 0.0857%. Based on Table 3.1 – Determination of Condition Index Based on Types of Patching and Pothole Damage, the pothole damage value at STA 2+500 – STA 2+600 is 0.0857% < 10%, corresponding to a Condition Index of 0.



**Figure 5.** Pothole Damage on STA 2+500 - STA 2+600

#### b. Transverse Crack Damage

The percentage of damage relative to the road width for transverse cracking at STA 2+500 – STA 2+600 was calculated to be 0.42%. Based on Table 3.2 – Determination of Condition Index Based on Types of Crack Damage, the transverse crack damage value at STA 2+500 – STA 2+600 is  $0.42\% < 10\%$ , corresponding to a Condition Index of 1.

Based on Table 3.2 – Determination of Condition Index Based on Types of Crack Damage, if transverse cracking occurs on the road, the condition index is 3. The width of the transverse crack damage at STA 2+500 – STA 2+600 is 2 cm. Therefore, according to the Table for Determining Condition Index Based on Type of Damage, with a crack width greater than 2 mm, the Condition Index is 3.



**Figure 6.** Transverse Crack Damage Of STA 2+500 - STA 2+600

## 2. Segment 2 Area STA 3+450 s/d STA 3+550

### a. Patching Damage

There is patching damage with a length of 100 meters and a width of 2 meters, resulting in a total damaged area of 200 m<sup>2</sup>. The percentage of patching damage to the total segment area at STA 3+450 – STA 3+550 is calculated using Equation 3.3, where the damaged area is divided by the segment area and multiplied by 100, yielding a damage percentage of 28.57%. Based on Table 3.1 – Determination of Condition Index Based on Types of Patching and Pothole Damage, the patching damage value at STA 3+450 – STA 3+550 is 28.57%, which falls within the 20–30% range, corresponding to a Condition Index of 2.



**Figure 7.** Patching Damage On STA 3+450 - STA 3+550

**b. Longitudinal Crack Damage**

The percentage of damage relative to the road width for longitudinal cracking at STA 3+450 – STA 3+550 was calculated to be 3.57%. Based on Table 3.2 – Determination of Condition Index Based on Types of Crack Damage, the longitudinal crack damage value at STA 3+450 – STA 3+550 is  $3.57\% < 10\%$ , corresponding to a Condition Index of 1.

Based on Table 3.2 – Determination of Condition Index Based on Types of Crack Damage, if longitudinal cracking occurs on the road, the condition index is 2. The width of the longitudinal crack damage at STA 3+550 is 2 mm. Therefore, according to the Table for

| SEGMENT | STA | Retak – Retak | Lubang dan<br>Tambalan | Angka<br>Kerusaka |
|---------|-----|---------------|------------------------|-------------------|
|---------|-----|---------------|------------------------|-------------------|

Determining Condition Index Based on Type of Damage, with a crack width in the range of 1 mm – 2 mm, the Condition Index is 2.



**Figure 8.** Longitudinal Crack Damage on STA 3+450 - STA 3+550

**3. Segment Assessment**

The segment assessment is obtained from the calculation and summation of the condition index values for each type of damage found in the road segment. The recap of the results of the Condition Index Determination and Road Damage Assessment can be seen in Table 3.1 below.

**Table 1.** Recapitulation Of Damage Index Determination Results

| [1]       | [2]                           | Angka Untuk Tipe Kerusakan     |       | Angka Untuk Lebar Kerusakan |        | Angka Untuk Luas Kerusakan |       | Angka Untuk Luas Kerusakan |       | [4]+[6]+[8]+[10] |
|-----------|-------------------------------|--------------------------------|-------|-----------------------------|--------|----------------------------|-------|----------------------------|-------|------------------|
|           |                               | Tipe                           | Angka | Lebar (mm)                  | Angka  | Luas (m <sup>2</sup> )     | Angka | Luas (m <sup>2</sup> )     | Angka |                  |
| 1         | 2+50<br>0<br>S/d<br>2+60<br>0 | Reta<br>k<br>Meli<br>ntan<br>g | 3     | ><br>mm                     | 2<br>3 | <10%                       | 1     | 0,6                        | 0     | 7                |
| 2         | 3+45<br>0<br>S/d<br>3+55<br>0 | Reta<br>k<br>Mem<br>anjan<br>g | 2     | 1-2<br>mm                   | 2      | <10%                       | 1     | 200                        | 2     | 7                |
| JUMLAH    |                               |                                |       |                             |        |                            |       |                            |       | 14               |
| RATA-RATA |                               |                                |       |                             |        |                            |       |                            |       | 7                |

In Table 1, the total road damage index value is 7. Therefore, based on the Table for Determining Road Condition Value Based on Total Damage Index, a damage index value between 7–9 corresponds to a Condition Value of 3. The Table of Road Condition Value Determination Results can be seen in Table 3.3.

#### 4. Priority Value Of Road Conditions

The Average Daily Traffic (ADT) data for this road can be seen in the table below. The Passenger Car Unit (PCU) values or vehicle types are classified into several categories, namely: MC refers to Motorcycles with 2 or 3 wheels, LV refers to Vehicles

Light Vehicles such as Passenger Cars, Minivans, Pickups, Sedans, or motor vehicles with 2 axles and an axle spacing of 2–3 meters, while HV refers to Heavy Vehicles such as Buses, 2-Axle Trucks, 3-Axle Trucks, and motor vehicles with more than 4 wheels. The results of the Average Daily Traffic (ADT) calculation can be seen in Table 2.

| Interval Waktu | Jenis Kendaraan |    |    | Total<br>Kend/jam | emp  |    |     | smp/hari | Ket |
|----------------|-----------------|----|----|-------------------|------|----|-----|----------|-----|
|                | MC              | LV | HV |                   | MC   | LV | HV  |          |     |
| 08.00 - 09.00  | 120             | 3  | 2  | 125               | 0,5  | 1  | 1,3 | 65,6     |     |
| 09.00 - 10.00  | 100             | 5  | 4  | 109               | 50   | 5  | 5,2 | 60,2     |     |
| 10.00 - 11.00  | 58              | 10 | 3  | 71                | 29   | 10 | 3,9 | 42,9     |     |
| 11.00 - 12.00  | 35              | 3  | 1  | 39                | 17,5 | 3  | 1,3 | 21,8     |     |
| 12.00 - 13.00  | 46              | 2  | 1  | 49                | 23   | 2  | 1,3 | 26,3     |     |
| 13.00 - 14.00  | 25              | 6  | 2  | 33                | 12,5 | 6  | 2,6 | 21,1     |     |
| 14.00 - 15.00  | 67              | 5  | 2  | 74                | 33,5 | 5  | 2,6 | 41,1     |     |

|              |   |              |            |           |           |            |            |           |             |              |                   |
|--------------|---|--------------|------------|-----------|-----------|------------|------------|-----------|-------------|--------------|-------------------|
| 15.00        | - | 16.00        | 75         | 1         | 1         | 77         | 37,5       | 1         | 1,3         | 39,8         |                   |
| <b>16.00</b> | - | <b>17.00</b> | <b>150</b> | <b>15</b> | <b>5</b>  | <b>170</b> | <b>75</b>  | <b>15</b> | <b>6,5</b>  | <b>96,5</b>  | <b>Jam Puncak</b> |
| 17.00        | - | 18.00        | 50         | 10        | 3         | 63         | 25         | 10        | 3,9         | 38,9         |                   |
| <b>TOTAL</b> |   |              | <b>726</b> | <b>60</b> | <b>24</b> | <b>810</b> | <b>363</b> | <b>60</b> | <b>31,2</b> | <b>454,2</b> |                   |

Table 2. LHR Calculation Result Data

In Table 2, the Average Daily Traffic (ADT) value on the road is 454.20. Therefore, based on Table 3.4 of Road Class Values, the ADT falls within the range of 200–500, corresponding to Road Class 3.

Based on the data, the Road Class Value is 3, while the Road Condition Value is also 3. Therefore, the Road Priority Value can be determined using Equation 3.4. The Road Priority Value is as follows:

$$\begin{aligned}
 \text{Nilai Prioritas} &= 17 - (\text{Kelas LHR} + \text{Nilai Kondisi Jalan}) \\
 &= 17 - (3+3) \\
 &= 17 - 6 \\
 &= 11
 \end{aligned}$$

From the calculation, the priority value for the road is 11. Therefore, based on Table 3.5 of Priority Values or Priority Rankings, this result is categorized under the Routine Maintenance Program.

### Accident Characteristic Percentage

The pavement type used on the Simpang Parit Rampak – Simpang PT. Mos road is flexible pavement. The road geometry of the Simpang Parit Rampak – Simpang PT. Mos section is generally divided into two parts: a road without a median (STA 0+000 – 2+500) and a road with a median (STA 2+500 – 4+280). The geometric road data are as follows:

a. Road Without Lane Dividers (STA 0+000 – 2+500)

- Path Width : 7 m
- Shoulder Width : 1 m

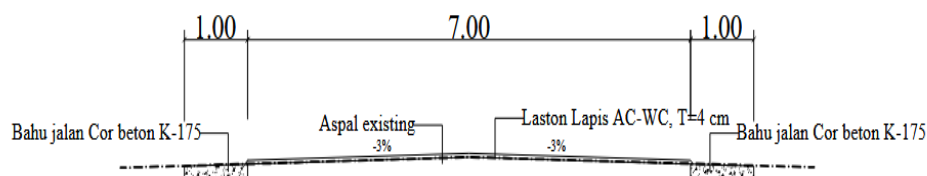
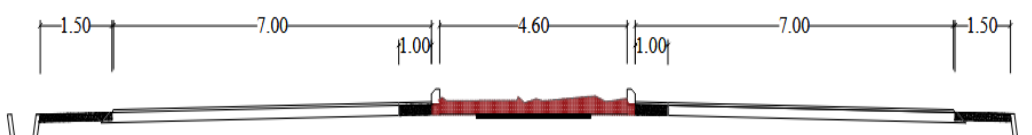


Figure 9. Sketsa Potongan Melintang Jalan Tanpa Median

b. Jalan dengan Median (STA 2+500 – 4+280)

- Lebar jalur : 7 meter
- Lebar Median : 4,6 meter
- Lebar Trotoar : 1,5 meter



**Gambar 10.** Sketsa Potongan Melintang Jalan Dengan Median

### Accident Recapitulation

Based on the recapitulation of traffic accident data that occurred during 2022–2024, the total number of accidents per kilometer along the Simpang Parit Rampak – Simpang PT. Mos road section is shown in Table 3.3.

**Tabel 3.**Jumlah Kecelakaan Pada Ruas Jalan Simpang Parit Rampak–Simpang PT. Mos (Dishub Karimun, 2022-2024)

| Tahun | Jumlah Kecelakaan |
|-------|-------------------|
| 2022  | 9                 |
| 2023  | 7                 |
| 2024  | 4                 |
| Total | 20                |

### Accident Characteristic

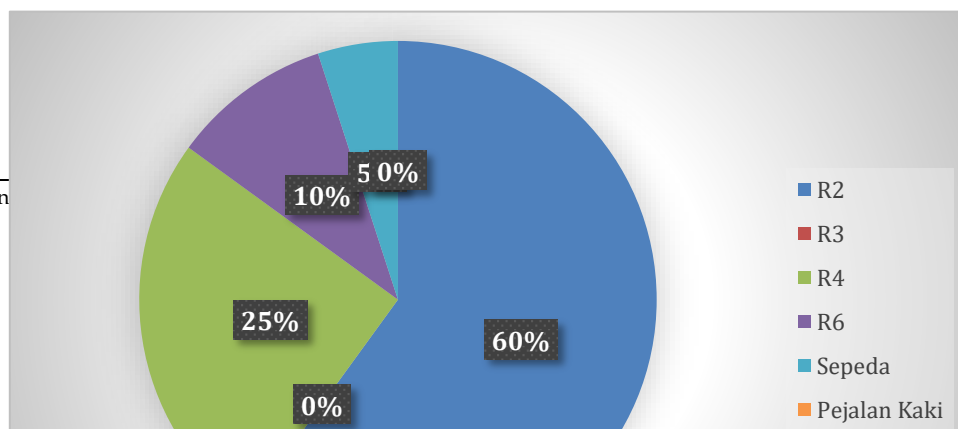
The analysis of accident characteristics on the Simpang Parit Rampak – Simpang PT. Mos road was conducted based on Pd T-09-2004-B from the Department of Human Settlements and Regional Infrastructure using the “5W+1H” approach, namely: Why (the cause of the accident), What (the type of collision), Where (the accident location), Who (the road users involved), When (the time of occurrence), and How (the type of vehicle movement), as follows :

a. Based On The Users Involved In The Accident (Who)

Based on the road users involved in the accident (Who), the road users are categorized into 2-wheeled vehicles, 3-wheeled vehicles, 4-wheeled vehicles, 6-wheeled vehicles, bicycles, and pedestrians. The number of each type of vehicle involved is shown in Table 4 and Figure 3.11

**Tabel 2.** Jumlah Kendaraan Terlibat kecelakaan (Dishub Karimun, 2022-2024)

| Pengguna Jalan Terlibat | R2 | R3 | R4 | R6 | Sepeda | Pejalan Kaki |
|-------------------------|----|----|----|----|--------|--------------|
| Jumlah Kecelakaan       | 12 | 0  | 5  | 2  | 1      | 0            |



**Gambar 11.** Persentase Pihak Terlibat Kecelakaan

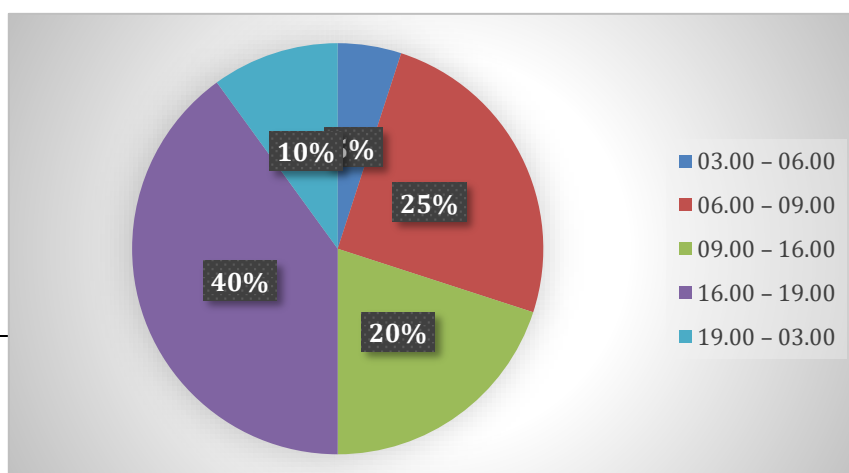
The assessment results show that the percentage of road users involved in accidents is as follows: 2-wheeled vehicles 60%, 3-wheeled vehicles 0%, 4-wheeled vehicles 25%, 6-wheeled vehicles 10%, bicycles 5%, and pedestrians 0%. Based on these results, it can be concluded that the road users most frequently involved in accidents are 2-wheeled vehicles (motorcycles), with a percentage of 60%.

b. Based on the Time of Accident Occurrence (When)

The time of accident occurrence is divided into five periods based on the lighting conditions on the Simpang Parit Rampak – Simpang PT. Mos road, namely: early morning (03:00–06:00), morning (06:00–09:00), daytime (09:00–16:00), evening (16:00–19:00), and night (19:00–03:00). The number of accidents in each time period is shown in Table 3.5, with the corresponding percentages presented in Figure 3.12.

**Tabel 3.** Jumlah Kecelakaan pada Masing – masing Pembagian Waktu (Dishub Karimun, 2022-2024)

| Waktu Kejadian | Jumlah Kecelakaan |
|----------------|-------------------|
| 03.00 – 06.00  | 1                 |
| 06.00 – 09.00  | 5                 |
| 09.00 – 16.00  | 4                 |
| 16.00 – 19.00  | 8                 |
| 19.00 – 03.00  | 2                 |
| Total          | 20                |



**Figure 12.** Persentase Waktu Terjadinya Kecelakaan

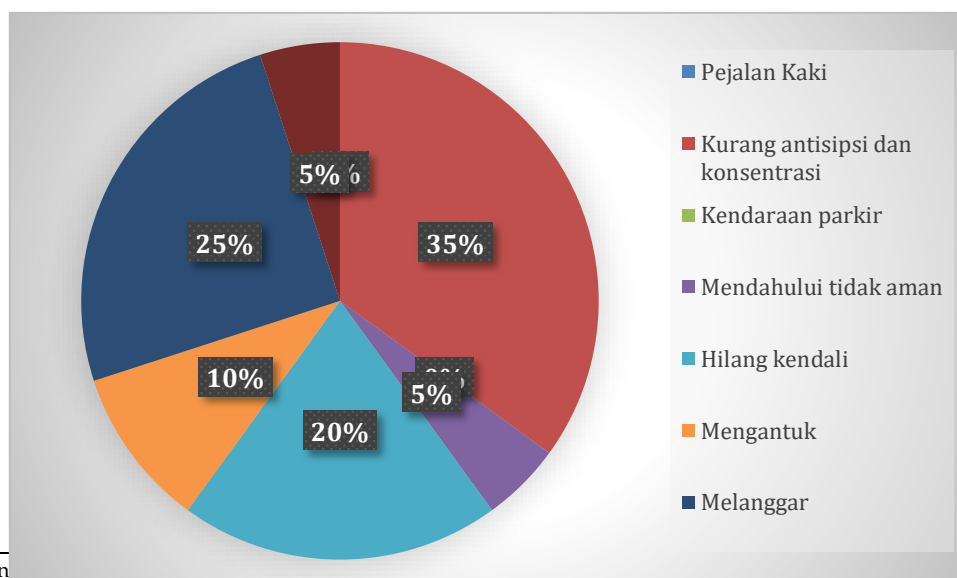
Based on the assessment results, the percentage of accidents by time period is as follows: 03:00–06:00 at 5%, 06:00–09:00 at 25%, 09:00–16:00 at 20%, 16:00–19:00 at 40%, and 19:00–03:00 at 10%. From these results, it can be concluded that the time period with the highest number of accidents is 16:00–19:00, with 8 incidents or 40%.

c. Based on the Cause of Accident (Why)

The causes of accidents refer to Pd T-09-2004-B, which include pedestrians, lack of anticipation and concentration, parked vehicles, unsafe overtaking, loss of control, drowsiness, violations, and collisions. The number of accidents for each cause is presented in Table 3.6, with the corresponding percentages shown in Figure 3.13.

**Tabel 4.** Penyebab Kecelakaan Pada Jalan Simpang Parit Rampak – Simpang PT. Mos (Dishub Karimun, 2022-2024)

| Penyebab Kecelakaan               | Jumlah Kecelakaan |
|-----------------------------------|-------------------|
| Pejalan Kaki                      | 0                 |
| Kurang antisipasi dan konsentrasi | 7                 |
| Kendaraan parkir                  | 0                 |
| Mendahului tidak aman             | 1                 |
| Hilang kendali                    | 4                 |
| Mengantuk                         | 2                 |
| Melanggar                         | 5                 |
| Bersenggolan                      | 1                 |
| Total                             | 20                |



**Figure 13.** Persentase penyebab kecelakaan

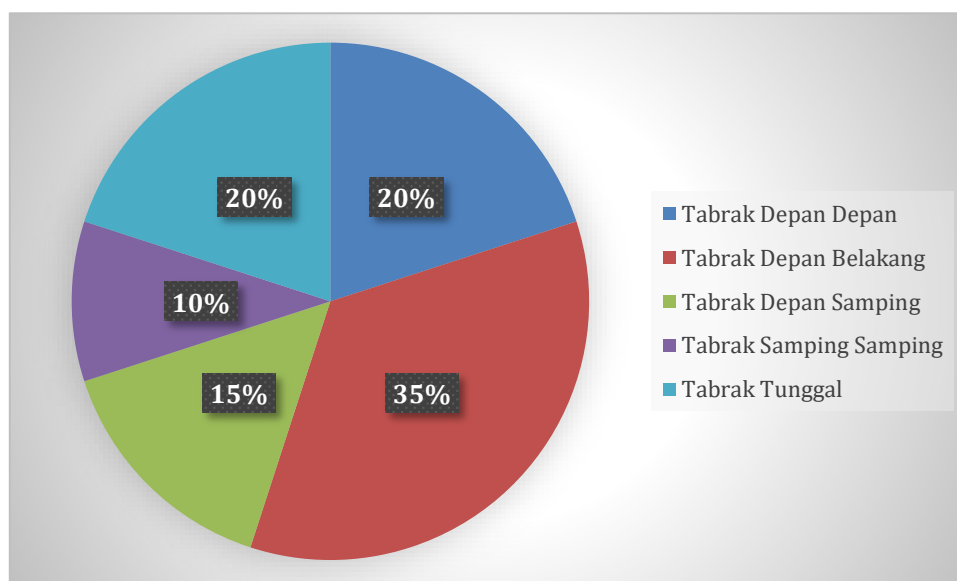
Based on the assessment results, the leading cause of accidents is due to a lack of anticipation and concentration, with a percentage of 35%.

d. Based on the Type of Collision (What)

Based on the accident recapitulation data, collision types are categorized into Side-Side Collision, Rear-End Collision, Single-Vehicle Collision, Collision with Structure, Front-Side Collision, Head-On Collision, and Collision with Pedestrian. The number of accidents for each type is shown in Table 3.7, with the corresponding percentages presented in Figure 3.14.

**Table 5.** Penyebab Kecelakaan Pada Jalan Simpang Parit Rampak – Simpang PT. Mos (Dishub Karimun, 2022-2024)

| Tipe Tabrakan          | Jumlah Kecelakaan |
|------------------------|-------------------|
| Tabrak Depan Depan     | 4                 |
| Tabrak Depan Belakang  | 7                 |
| Tabrak Depan Samping   | 3                 |
| Tabrak Samping Samping | 2                 |
| Tabrak Tunggal         | 4                 |
| Total                  | 20                |



**Figure 14.** Persentase Tipe Tabrakan

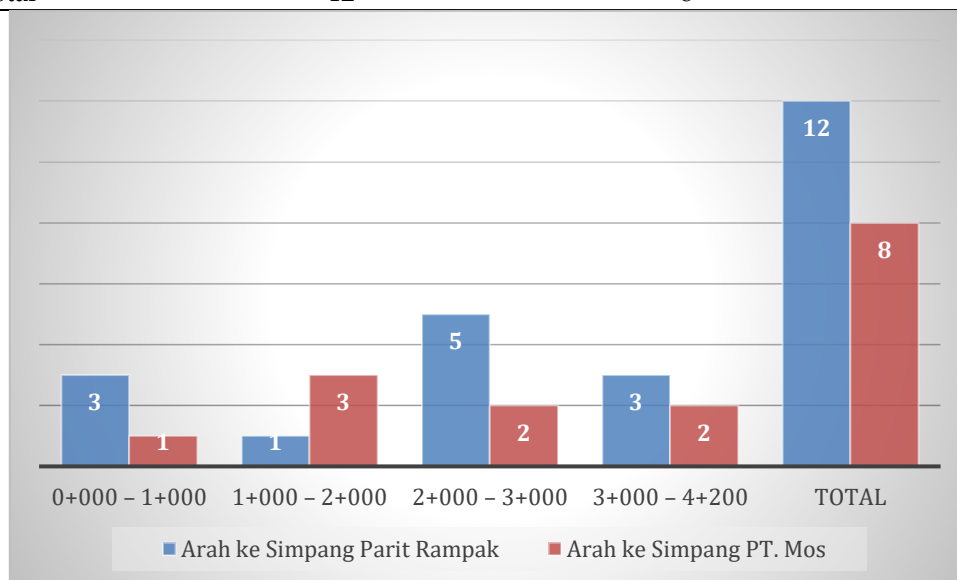
Based on the assessment results, the most frequent type of accident on the Simpang Parit Rampak – Simpang PT. Mos road is rear-end collisions, with a total of 7 incidents or 35%.

e. Based on the Accident Location (*Where*)

In the analysis, the Simpang Parit Rampak – Simpang PT. Mos road is divided into 18 segments, with the number of accidents in each segment presented in Table 3.8 and the corresponding bar chart shown in Figure 3.15.

**Table 6.** Number Of Accident Locations On The Road Simpang Parit Rampak Simpang PT. Mos (Dishub Karimun, 2022-2024)

| STA           | Directions to Parit Rampak Intersection | Directions to Simpang PT. Mos |
|---------------|---|-------------------------------|
| 0+000 – 1+000 | 3                                       | 1                             |
| 1+000 – 2+000 | 1                                       | 3                             |
| 2+000 – 3+000 | 5                                       | 2                             |
| 3+000 – 4+280 | 3                                       | 2                             |
| Total         | 12                                      | 8                             |



**Figure 15.** Bar Chart Accident Location

The location with the highest accident frequency occurred at STA 2+000–3+000, in the direction of the Parit Rampak intersection.

f. Based On Vehicle manemuvvers (*How*)

Traffic accidents are generally preceded by vehicle movements or maneuvers. Vehicle movements, as referred to in the traffic accident reports, include going straight, overtaking, turning, making a U-turn, stopping/parking, entering or exiting property access, changing lanes, and moving slowly. The vehicle maneuver recorded is the one that initiated the occurrence of the accident.

The number of vehicle maneuvers is shown in Table 3.9, with the corresponding

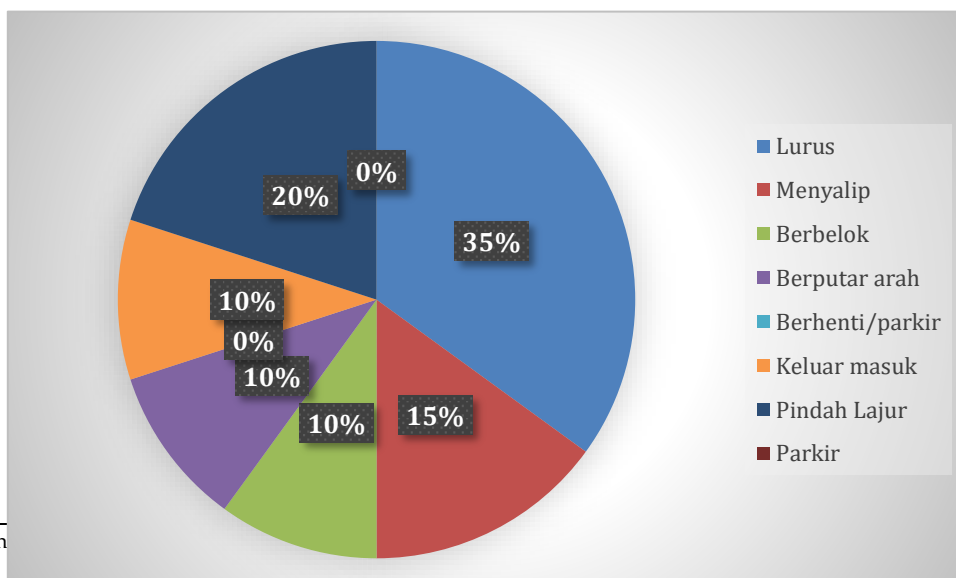
| Manuver     | Number Of Moves |
|-------------|-----------------|
| In and out  | 2               |
| Change lane | 4               |
| Parking     | 0               |
| Sum         | 20              |

percentages presented in Figure 3.13

**Table 7.** Number Of Vehicle Maneuvers On The Parit Rampak Simpang PT. Mos (Dishub Karimun, 2022-2024)

| Manuver     | Number Of Moves |
|-------------|-----------------|
| Straight    | 7               |
| Overtaking  | 3               |
| Turn        | 2               |
| Turn Around | 2               |
| Stop/Park   | 0               |

**Table 8.** Number Of Vehicle Maneuvers On The Simpang Parit Rampak-Simpang Road Section (Continued)



**Figure 16.** Percentage Of Vehicle Manuevers

From the assessment results, it was found that the vehicle maneuver most frequently involved in accidents was vehicles moving straight, with a total of 7 cases, accounting for 35%.

### **Star Rating Score Of Risk Factors For Each Parameter**

Based on the *Technical Guidelines for Roadworthiness Testing Using the Star Rating System* issued by the Ministry of Public Works and Housing, Directorate General of Highways (Bina Marga), 2024, the Risk Factor Value or Crash Modification Factor (CMF) is a multiplier used to estimate the expected number of crashes after countermeasures are implemented at a specific location. The CMF is applied in the star rating system to link road attributes with the level of crash risk.

From this discussion, it can be concluded that the correlation between Road Surface Condition, Accident Characteristics, and Star Rating is as follows: a) Based on the Road Surface Condition, a priority value of 11 was obtained, which means the road falls under the routine maintenance program. To identify risk factors, the road surface condition value was correlated with the risk factor type of pavement condition and categorized as moderate. From this correlation, the Star Rating Result was determined. b) Based on the analysis of accident characteristics, the data were correlated with the accident type score, referring to the relationship between accident types such as run-off-road accidents (SRSRun-off), head-on collisions due to loss of control (SRSHo-Loc), head-on collisions during overtaking (SRSHo-ot), intersection accidents (SRSInt), and property access accidents (SRSPa). From this correlation, the Star Rating Result was obtained.

From the results of the discussion, it can be concluded that the correlation between the road surface condition, accident characteristics, and star rating is interrelated in determining the star category and achieving a safer road.

### **Conclusion**

Based on the results of this study, the following conclusions can be drawn: 1)The road surface condition on the Simpang Parit Rampak – Simpang PT. Mos section, with a total length of 4,280 meters, shows several types of damage, including potholes, transverse cracks, patching damage, and longitudinal cracks. The Priority Value / Priority Order is 11, which, according to the Bina Marga Table, falls under the category of a Routine Maintenance Program. 2)The accident characteristics indicate that 60% of the accidents involve two-wheeled vehicles. The time of accidents most frequently occurs between 16:00–19:00, accounting for 40% of cases. The main causes of accidents are lack of

anticipation and lack of concentration, with a percentage of 35%. The most common type of accident is rear-end collision, also at 35%. The location with the highest accident frequency is between STA 2+000–3+000, in the direction of Simpang Parit Rampak, and the most frequent vehicle maneuver involved in accidents is vehicles moving straight, at 35%. 3)The Star Rating Category for Segment 1 falls under 3-Star Category, and the road segment is colored orange, indicating a road considered to be safe. Meanwhile, the Star Rating Category for Segment 2 falls under the 4-Star Category, and the segment is colored yellow, indicating a safer road.

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