Customer Satisfaction and Road Performance in Long Segment Maintenance Contract: Application of an Urban Road Network

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***Abstract*—** Urban road networks have an essential role in maintaining the flow of transportation and logistics in urban areas. Implementing the Long Segment Maintenance Contract (LSMC) is one step in producing better road services and performance. The success rate of PMS implementation can be seen from the road performance and the level of satisfaction of stakeholders consisting of owners, implementers, supervision consultants, and users. This study was conducted to determine stakeholders' level of interest and satisfaction in the implementation of LSMC in the mountain road network. The methods used are Importance Performance Analysis and Customer Satisfaction Index. As a case study, an urban road network was chosen on Jalan Sultan Agung, West Java, Indonesia, along 3.54 km. Questionnaires were distributed to all stakeholders in the implementation of LSCM in these sections. Data analysis was carried out on questionnaires obtained from the owner as many as five respondents, contractors three respondents, supervised two respondents, and road users as many as 100 respondents. The results showed in general. The results showed that, in general, the level of importance of road users was relatively high, with an average of 3.87, an average performance level of 3.70, and a CSI value of 74.20% or satisfied. While the level of stakeholder importance on-road performance is relatively high with an average of 4.64 with an average performance level of 4.30, and a CSI value of 86.51% or very satisfactory. Furthermore, the level of stakeholder importance on-road response time is relatively high, with an average of 4.59, an average performance level of 4.26, and a CSI value of 86.00% or very satisfactory. Attributes that greatly influence the opinion of road users and stakeholders on LSCM in the Urban Road Network are related to routine road maintenance.

***Keywords*—** Long Segment, Road Performance, Satisfaction, Urban Road Network.

I. INTRODUCTION

[Font: Times New Roman, Size:10] Indonesia is one of the countries with an extensive area and spread in various fields. The region's integration requires a reliable road network, with the main backbone being national roads. National roads are arterial and collector roads in the primary road network system with a length of 47,017.27 km. The primary system is a road network system that distributes goods and services for the development of all regions at the national level. At the same time, the secondary system is a road network system that distributes goods and services to people in urban areas (Mukhsin, Agustina, & Fernanda, 2020). Indonesia is an archipelagic country with a combination of volcanic mountains, so it has diverse geography. Indonesia's various forms of the land surface are divided into flat terrain, hills, and mountains.

Road terrain in Indonesia is classified according to the condition of most terrain slopes measured perpendicular to the contour line. The uniformity of the projected terrain conditions must consider the uniformity of the terrain conditions according to the road alignment plan by ignoring changes in small parts of the road plan segment. The slope is between 3 and 25%, including hills terrain. The road's character in the urban area is different from other fields. Geometrics and natural conditions significantly influence pavement and road performance in this hills terrain (Yang, Fang, Qiu, & Zhu, 2018).

The availability of transportation facilities and infrastructure is one of the essential elements in supporting community activities in urban areas. It is known that road facilities and infrastructure are the main components of the land transportation system (Skorobogatova & Kuzmina-Merlino, 2017). Therefore, a Pavement Management System (PMS) is needed to realize sustainable infrastructure. Internationally, PMS has experienced rapid progress and continues to be developed in various countries (Loprencipe, Pantuso, & Di Mascio, 2017).

PMS is essential in maintaining road performance through planning, implementation, and maintenance. This process can be carried out if the stakeholders properly conduct a series of activities. To get the right

strategy in the implementation of PMS, decision-makers must be able to interpret the existing data and, at the same time, predict the condition of feelings in the future (Rifai, Hadiwardoyo, Correia, & Pereira, 2016). Currently, in developed countries, PMS is an essential thing in the management of road pavement management. PMS will increase rapid access between urban and rural communities, assist in reducing poverty, increasing the growth and socio-economic development of any country (Mantalovas & Di Mino, 2019). Furthermore, PMS that is carried out continuously and pays attention to changing field needs can positively influence the quality of road services (Wang & Pyle, 2019).

Several developing countries, including Indonesia, have implemented PMS in road pavement maintenance. The implementation of PMS in Indonesia has undergone many developments, starting with conventional management and performance-based contracts. The Long Segment Maintenance Contract (LSMC) has been implemented (Rifai, Handayani, & Lita, 2018). Since 2016, the performance of the LSMC has continued to be developed by making various improvements to various variables. Of course, the implementation of LSCM has advantages and disadvantages, so some upgrades and improvements are still needed.

Road conditions in the urban road network are dynamic and require adaptive handling and maintenance. The LSMC that continues to be developed by involving all stakeholders provides better opportunities for its implementation. Therefore, the choice of LSMC can be the right choice for road maintenance in the urban road network. Over the past five years, LSMC has been used in road maintenance in the urban road network. However, customer satisfaction analysis is needed to measure the success of this type of maintenance. Based on the background of the problem, this paper will discuss the analysis of customer satisfaction and road performance in LSCM applications in an urban road network.

II. LITERATURE REVIEW

A road maintenance contract is a form of Contract in the implementation of construction work. Currently, the condition of the Contract is carried out periodically where the period of responsibility for the performance of the work is during the physical implementation and the guarantee period is several months. So that if there is damage to the construction that is faster than the planned life, it will be the responsibility of the service user. The above occurs because the form of an employment contract between service users and service providers is a binding work contract for a short period (Yarmukhamedov, Smith, & Thiebaud, 2020).

Some types of contracts in Indonesia can be divided into four parts. First, the Contract is based on cost calculations using the fixed lump sum price and unit price methods. Second is the analysis of services, namely using the cost method without services, costs plus services, and expenses plus definite benefits. Third, the payment system, namely monthly, for achievements and full pre-funding by service providers. The last is based on the division of tasks, namely conventional contracts, turnkey, and Engineering Procurement and Construction (EPC) (Choi, Choi, Kim, & Lee, 2021).

Traditional Pavement Maintenance Contracts in Indonesia follow the pattern of other construction contracts. The form of the division of tasks is straightforward. Namely, the service user assigns the service provider to carry out a job that has been planned by another party who is supervised by the leader appointed by the service user (Ismail, Razelan, Yusof, Zulkiple, & Masri, 2021). The advantage of conventional contracts is that service users in providing work have been divided among specialized service providers (planning consultants, supervisory consultants, and service providers working on projects) so that service users can reduce their involvement directly with the project. The weakness is the additional coordination of service users, so it requires other requests for service user staff.

Next is a Performance Based Contract (PBC), a type of Contract where payments for the management and maintenance of road assets are explicitly linked to contractors who successfully meet or exceed specific performance indicators. Road management through the PBC approach has advantages compared to traditional, namely cost savings in managing and maintaining road assets (Lu & Meng, 2018). Cost savings in this type of PBC contract can be realized due to Incentives to the private sector for innovation and higher productivity.

In the implementation of road maintenance contracts, various payment methods can be made, including the type of lump sum contract (Hafizyar & Mosaberpanah, 2018). A lump sum contract is a contract for completing all work within a specific time limit as specified in the Contract. Some of the characteristics of a lump sum contract are the amount of the price is fixed and fixed, and it is not possible to adjust the price. In a lump sum contract, all risks are fully borne by the executor. Payment is based on the stages of the product/output produced under the contents of the Contract.

Furthermore, the nature of the output-based work with the total bid price is binding.

A. Long Segment Maintenance Contract

Long Segment Maintenance Contract (LSMC) is a treatment in the maintenance of one road segment continuously to get uniform road conditions, which are stable and standard throughout the segment. The scope of activities (output) of the LSMC includes widening, reconstruction, repair, and maintenance of roads. Based on its implementation, LSMC also applies design-bid-build (DBB) as in conventional contracts. Still, the focus remains on-road performance and maintenance according to the scope of activities (Calahorra-Jimenez, Alarcón, Torres-Machi, Chamorro, & Molenaar, 2020).

Long Segment Maintenance Contract has four to five scopes of activity components (Directorate General of Highway, 2017). The outputs of the LSMC consist of reconstruction, preventive maintenance, major rehabilitation, minor rehabilitation, and widening. In addition, there is also preservation maintenance work, namely routine maintenance and corrective maintenance). The current implementation of the LSMC on various road networks aims to obtain optimal road maintenance. Optimization is done by carrying out handling in one road segment continuously to get uniform road conditions, namely stable and standard along the segment.

LSCM is the handling of road preservation within the limits of one continuous segment length (can be more than one segment) which is carried out to get uniform road conditions, namely steady and standard roads along the segment. LSCM is an effort to improve road performance, where performance-based road maintenance is required to meet the road service level. DGH's efforts to implement LSCM aim to enhance the performance of road maintenance actors to achieve the national target of road stability (Directorate General of Highway, 2017). The implementation of the Long Segment Road Preservation Scheme project is still experiencing problems in its performance, as can be seen from the implementation of projects that are subject to late fines, poor construction quality, and delays in completing work (Mohammadi, Igwe, Amador-Jimenez, & Nasiri, 2020).

A performance index of several components measures the road service level in the LSCM. Each performance component exhibits different qualities. To make it easier to get a comprehensive measure, it can be started by analyzing the level of stakeholder satisfaction. Some of the main stakeholders who can determine the success of LSCM implementation are contractors, project manager officers, supervision consultants, and customers of the national road. Therefore, a satisfaction index from stakeholders is expected to measure the success rate of LSCM implementation.

B. Urban Road Network

The road network system consists of a primary road network system and a hierarchically related secondary road network system. The primary road network system is a road network system with the role of distributing goods and services for the development of all regions at the national level by connecting all distribution service nodes in the form of activity centers. The secondary road network system is a road network system that distributes goods and services for people in urban areas. Good integration between road networks can ensure smooth traffic flow (Shepelev, Aliukov, Nikolskaya, & Shabiev, 2020). Several variables can assess the reliability of a road network, one of the most popular is measuring travel time (Li, Qu, Zhang, Li, & Ran, 2018).

The total length of the road network in Indonesia is 541,478 km, consisting of national roads, provincial roads, and district/city roads. The high number of road lengths requires good and sustainable asset management (Alshboul, Shehadeh, & Hamedat, 2021).

Currently, good road performance is only recorded on national roads with excellent and moderate conditions of 92%. However, it is not continuous on sub-national roads, namely provincial roads, which are in excellent and moderate condition, 68%, and district roads, only 57%. This condition causes high transportation costs. At the same time, the road network will be called effective if it consistently performs on all existing road networks.

Besides comprising various types of road authority, road asset management in Indonesia also faces challenges from multiple types of road terrain. The road network exists in various fields with different conditions and challenges. As an illustration, it is the road network in Java island, which is the area with the densest population and traffic in Indonesia.

The leading road network on the Island is through the northern coastal corridor, with the terrain character mainly in the lowlands. Meanwhile, to support the leading road network, a radial road is needed that connects cities and other areas in the center and south of Java Island. Of course, with an urban character as a characteristic of Indonesia, the connecting road network must pass through residential areas, offices, and other public facilities. The road network in the hills area has its challenges because it has different types of soil and rainfall (Wang, Wang, Zhang, Ni, & Yuan, 2020).

III. RESEARCH METHOD

This research was conducted using Importance Performance Analysis (IPA) and Customer Satisfaction Index (CSI). Data was collected from the urban road network that connects Jalan Bekasi Raya with Jalan Jenderal Sudirman, Bekasi. The case study location was chosen because the section is one of the main roads in Bekasi City. Primary data is obtained by observing and recording road performance conditions in the field. Furthermore, distributing questionnaires to all stakeholders in the implementation of the LSMC. The location and map of the segment used as a case study can be seen in Figure 1.

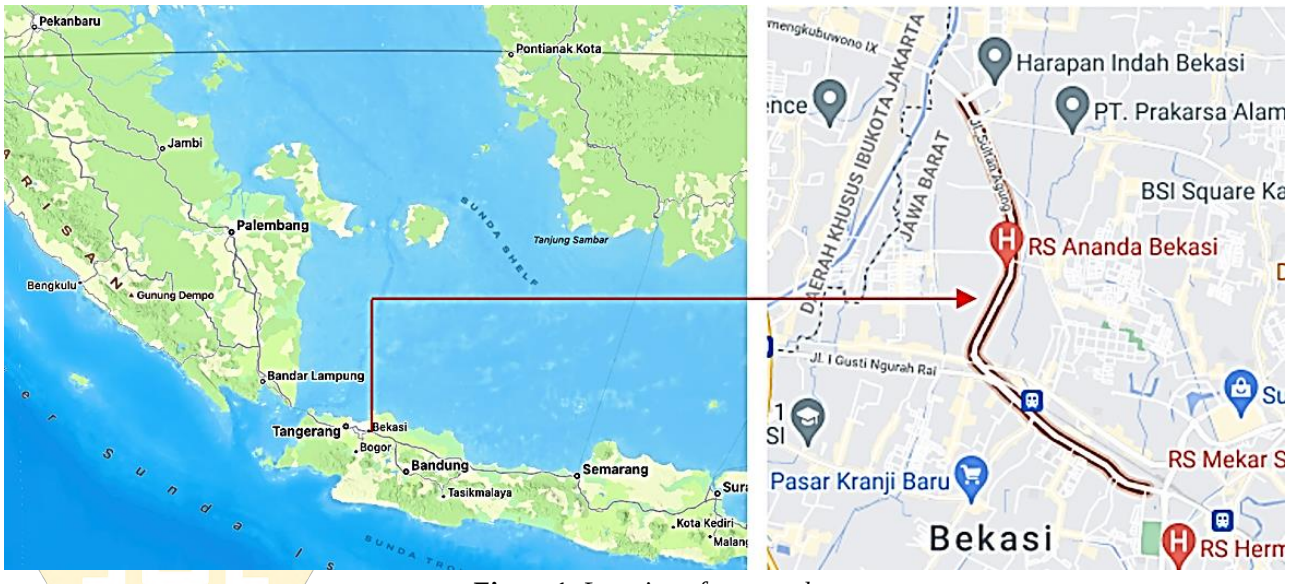

Figure 1: *Location of case study*

Several steps of analysis do data processing. After the statistical test is carried out, Importance Performance Analysis (IPA) is carried out. This IPA is a tool to compare the performance/service that service users can feel compared to the desired level of expectations. The level of conformity is the result of a comparison between the implementation performance score and the importance score so that this level of the agreement will determine the priority scale that will be used in suggestions for improving LSCM implementation. The results of the IPA will be displayed in a Cartesian diagram which depicts four parts bounded by two lines that intersect perpendicular to the points.

The application IPA begins with the identification of attributes that are relevant to the observed choice situation. Attribute lists can be developed using mean, median, or ranking measures, aggregated importance scores, and performance attributes and classified into high or low categories. By pairing the two rank sets, each attribute is assigned to one of the four predefined performance interest quadrants. IPA has been widely applied as an effective way of evaluating importance and performance value in the market, identifying opportunities for improvement, and guiding strategic planning efforts. In IPA, service attributes are plotted in a two-dimensional matrix based on the importance and performance of each attribute. The average or median importance and performance of all attributes divide the matrix into four quadrants. The priority for improvement is then summarized based on the location of the points. The matrix can be seen in Figure 2.

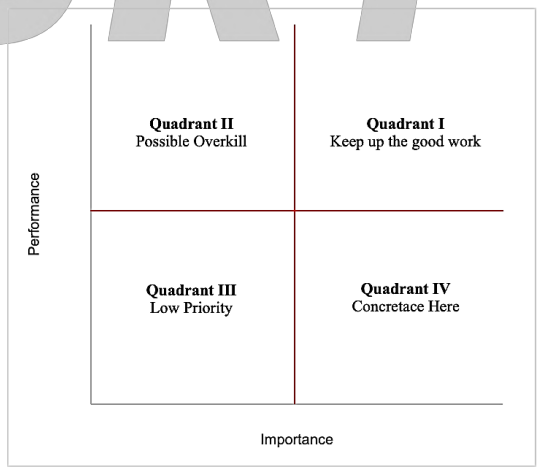

Figure 2: *Importance Performance Analysis*

Quadrant 1 (high importance and high performance) has the management scheme for this quadrant is 'continue to work well. Quadrant 2 (low importance and high performance) have a management scheme for this quadrant that is' likely to overdo.'Quadrant 3 (low importance and low performance): having a management scheme for this quadrant is' low priority.'Whereas Quadrant 4 (high importance and low performance) has a management scheme for this quadrant is 'concentrated here .'Furthermore, an analysis

of the customer satisfaction index (CSI) is carried out, which is an index to determine the level of overall stakeholder satisfaction. CSI provides precise data on the level of stakeholder satisfaction so that periodic evaluations can be carried out to improve various service variables.

Next, the Customer Satisfaction Index analysis was carried out. This step is a method that uses an index to measure the level of user satisfaction based on specific attributes.

Attributes measured can be different for each variable that has been set. The way to measure this index is done through 4 (four) stages, namely calculating:

1. Determine the Mean Importance Score (MIS). This value is derived from the average interest of each consumer.
2. Create a Weight Factor (WF). This weight is the percentage of MIS value per attribute to the total MIS of all attributes.
3. Make a score of Weight Score (WS). This weight is the multiplication between WF and the average level of satisfaction (X) (Mean Satisfaction Score - MSS)
4. Determine the Consumer Satisfaction Index (CSI).

IV. RESULT AND DISCUSSION

The survey was conducted during the period in August until December 2021. Questionnaires were distributed digitally to stakeholders who were directly involved in the implementation of LSMC in the urban road network. One hundred respondents returned questionnaires. The data processing results were separated into two parts: personal attributes and perceptions of LSMC. In this discussion, a statistical analysis of the IPA and CSI.

A. Personal Attributes

Respondents have different personal attributes, which of course, will also have other behavior and psychology in giving opinions about the implementation of LSCM. Therefore, these differences will affect the perception of the use of pavement management systems. The survey results can be seen in table 1. As for the gender, among the 100 respondents, 56 are male, or 56.00%. The age since the survey was conducted on the digital platform, and most of the network users and the primary labor force in the society are middle-aged, the age of the respondents is concentrated at 21-30 years old, accounting for 40.00%. As for the occupation, 48.00% of the respondents are employees of the private sector. As for the time per week, 41.00% of the respondents more than three times. Finally, the most vehicles used by respondents were private cars, as much as 51.00%.

Table 1: *Statistical characteristics of road user*

Variable	Category	Frequency	Relative Frequency
Gender	Male	56	56,00%
	Female	44	44,00%
Age	Under 20 years old	9	9,00%
	21 – 30 years old	40	40,00%
	31 – 40 years old	22	22,00%
	41 – 50 years old	19	19,00%
	Above 50 years old	10	10,00%
Occupation	Government sector employees	19	19,00%
	Private sector employees	48	48,00%
	Entrepreneur	10	10,00%
	Student	17	17,00%
	Housewife	17	17,00%
	Public Transport Driver	5	5,00%
Trip per Week	1 Time	26	26,00%
	2 Times	18	18,00%
	3 Times	15	15,00%
	>3 Timer	41	41,00%
Vehicle	Car	51	51,00%
	Motorcycle/Scooter	31	31,00%
	Public Transport	18	18,00%

Research is conducted on road users and stakeholders consisting of owners, contractors, and supervision consultants. The following table shows the characteristics of the respondents from the stakeholder. Experience in Long Segment contracts, most respondents have two years of experience in applying LSMC. This is because the application-based contract system is still relatively new, and there is still room for further evaluation.

Table 2: *Statistical characteristics of stakeholder*

Variable	Category	Frequency	Relative Frequency
Gender	Male	7	70,00%
	Female	3	30,00%
Age	Under 20 years old	0	00,00%
	21 – 30 years old	0	00,00%
	31 – 40 years old	5	50,00%
	41 – 50 years old	3	30,00%
	Above 50 years old	2	20,00%
Occupation	Owner	5	50,00%
	Contractor	3	30,00%
	Supervision	2	20,00%
Education	High School	2	20,00%
	Diploma	1	10,00%
	Bachelor	6	60,00%
	Graduate	1	10,00%
	Postgraduate	0	00,00%
Professional Experience	1 year	3	30,00%
	2 years	7	70,00%
	3 years	0	00,00%
	4years	0	00,00%
	> 4 years	0	00,00%

B. Validity Test

The validity test of the user and stakeholder questionnaire uses the Pearson Correlation value with a level of significance of 95%, namely road users 0.195 and stakeholders 0.532. To analyze whether the responses obtained from the respondents can be said to be valid, then a validity test will be carried out for all respondents. This validity test will be carried out using the help of SPSS version 26 software. In Table 3, it can be seen that the validity test for LSCM implementation stakeholders. While Table 4 and Table 5 are validity tests for road users.

Table 3: *The validity test of road user*

id	Attribute	R-count		R-table	Remarks
		Importance	Performance		
A1	Pavement condition	0,561	0,561	0,195	Valid
A2	Shoulder Condition	0,619	0,550	0,195	Valid
A3	Drainage Condition	0,598	0,629	0,195	Valid
A4	Traffic and Road Sign	0,606	0,616	0,195	Valid
A5	Road infrastructure support	0,682	0,622	0,195	Valid
A6	Control of plant and grass	0,611	0,729	0,195	Valid

Table 3 shows that all questions for the LSCM attribute for stakeholders have valid status because the value of count (Corrected item-total Correlation) > rtable is 0.195. So that the validity test for stakeholders, all variables show valid conclusions.

Table 4: *The validity test of stakeholder–performance indicators*

id	Attribute	R-count		R-table	Remarks
		Importance	Performance		
B1	Pothole	0,898	0,906	0,532	Valid
B2	Cracking	0,639	0,897	0,532	Valid
B3	Corrugation	0,898	0,723	0,532	Valid
B4	Rigid fault	0,853	0,736	0,532	Valid
B5	Joint sealant	0,728	0,877	0,532	Valid
B6	Roughness	0,801	0,887	0,532	Valid
B7	Pothole of shoulder	0,801	0,901	0,532	Valid
B8	Elevation gap	0,801	0,722	0,532	Valid
B9	Shoulder corrugation	0,665	0,887	0,532	Valid

B10	Ditch condition	0,665	0,858	0,532	Valid
B11	Slope conditions	0,665	0,840	0,532	Valid
B12	Traffic and Road Sign	0,898	0,840	0,532	Valid
B13	Median and pedestrian	0,665	0,809	0,532	Valid
B14	Guardrail	0,813	0,869	0,532	Valid
B15	Approach road	0,791	0,888	0,532	Valid
B16	Retaining wall	0,830	0,916	0,532	Valid
B17	Expansion joint	0,898	0,793	0,532	Valid
B18	Guardrail of bridge	0,898	0,793	0,532	Valid
B19	Road and shoulder cleanliness	0,741	0,665	0,532	Valid
B20	Control of plant and grass	0,703	0,793	0,532	Valid

From table 4 above, it can be seen that all attributes can be said to be valid. At the same time, the rest of the variables are not valid to be used as samples in this paper. The valid variable is most likely a variable that is of full attention and becomes the needs of road users. Furthermore, only valid variables will be used in further analysis.

Table 5: *The validity test of road user – response time*

id	Attribute	R-count		R-table	Remarks
		Importance	Performance		
C1	Pothole	0,681	0,811	0,532	Valid
C2	Cracking	0,613	0,836	0,532	Valid
C3	Corrugation	0,613	0,853	0,532	Valid
C4	Rigid fault	0,707	0,838	0,532	Valid
C5	Joint sealant	0,799	0,838	0,532	Valid
C6	Roughness	0,867	0,869	0,532	Valid
C7	Pothole of shoulder	0,867	0,892	0,532	Valid
C8	Elevation gap	0,867	0,847	0,532	Valid
C9	Shoulder corrugation	0,705	0,887	0,532	Valid
C10	Ditch condition	0,705	0,805	0,532	Valid
C11	Slope conditions	0,664	0,888	0,532	Valid
C12	Traffic and Road Sign	0,699	0,817	0,532	Valid
C13	Median and pedestrian	0,734	0,913	0,532	Valid
C14	Guardrail	0,638	0,823	0,532	Valid
C15	Approach road	0,861	0,770	0,532	Valid
C16	Retaining wall	0,867	0,815	0,532	Valid
C17	Expansion joint	0,681	0,913	0,532	Valid
C18	Guardrail of bridge	0,666	0,805	0,532	Valid
C19	Road and shoulder cleanliness	0,792	0,789	0,532	Valid
C20	Control of plant and grass	0,703	0,745	0,532	Valid

From table 5 above, it can be seen that all attributes can be said to be valid. At the same time, the rest of the variables are not valid to be used as samples in this paper. The valid variable is most likely a variable that is of full attention and becomes the needs of road users. Furthermore, only valid variables will be used in further analysis.

C. Reliability Test

A reliability test was conducted to measure the level of consistency of a questionnaire. In this study, reliability testing was carried out using SPSS Statistics version 26 Software. Determination of whether a questionnaire is considered reliable or not is the result of the alpha value of the test results. If the Cronbach Alpha value of the reliability coefficient r> 0.6, then the study is considered reliable.

D. Importance of Performance Analysis

In data processing using IPA, the Conformity Level (Tki) analysis is carried out by dividing the satisfaction score by the importance score, and the results are presented in the form of a percentage. From the road user questionnaire data, the average Conformity Level (Tki) is 95.04% which, according to the literature the value is included in the "Very Satisfactory" category. In the stakeholder questionnaire, there is two Conformity Level (TKI) analyses based on performance indicators and response time. From the stakeholder questionnaire data, the average Conformity Level (Tki) based on performance indicators is 92.64% and the Conformity

Level (Tki) based on response time is 92.83% which, according to the literature, the value is included in the "Very Satisfactory" category.

There is also an analysis of the level of importance and satisfaction in data processing using IPA. This analysis is presented using a Cartesian diagram which is divided into four quadrants. In the analysis of the level of importance and satisfaction of the road user questionnaire, it was found that there were three assessment attributes in quadrant II, which means that these attributes are good according to the user and need to be maintained in quality. While the remaining three attributes are in quadrant III, which means the level of importance is low and the level of satisfaction is also typical, it is better to improve the quality. In Fig 3, Fig 4, and Fig 5 below, can be seen the distribution of the IPA analysis that has been carried out.

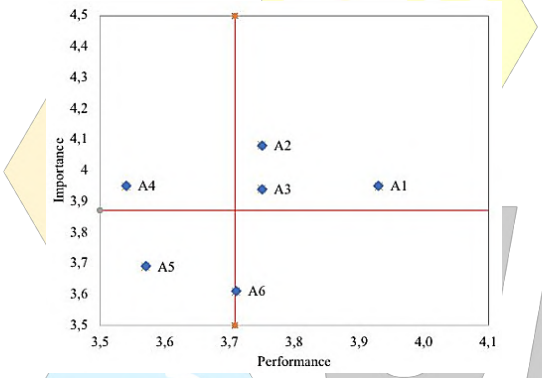

Figure 3: *Importance Performance Analysis Diagram for Road User*

Looking at figure 3 above, it can be seen that the Pavement Condition (A1) is considered important and has been satisfactory. Meanwhile, Traffic and Road Sign (A4) is considered important but unsatisfactory. So one of the messages from this IPA analysis is that repairs must be made immediately for A4. This condition should be handled immediately because the completeness of the road attributes as a guide and pioneer of traffic on the road.

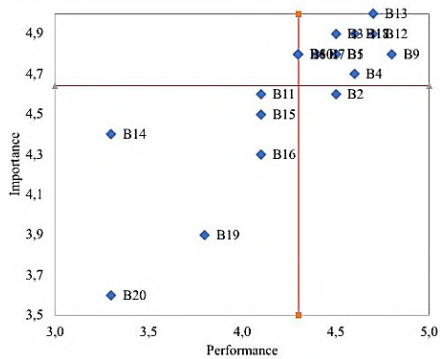

Figure 4: *Importance Performance Analysis Diagram Stakeholder Performance Indicators*

Meanwhile, in Importance Performance Analysis of Stakeholders for Performance Indicators, it is found that the Cracking variable (A4) is considered important but not satisfactory. Crack conditions on roads with high vehicle intensity often occur, and the handling of road regularly cracks regarding road safety guidelines needs to be continuously realized. Road management stakeholders in carrying out road maintenance crack conditions.

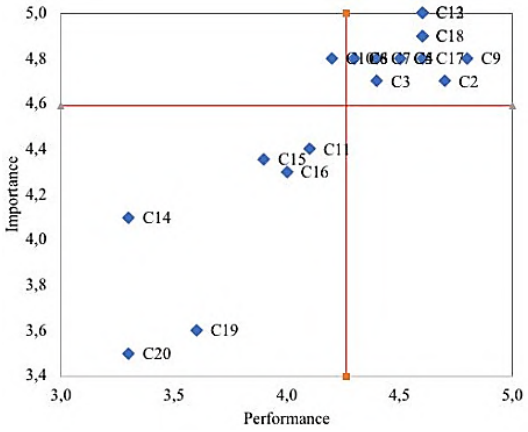

Figure 5: *Importance Performance Analysis Diagram Stakeholder for Respond Time*

Meanwhile, from Importance Performance Analysis of Stakeholders for Response Time, it is found that the Ditch condition variable (B10) is considered unsatisfactory. This condition should get more attention from stakeholders by conducting routine checks on channel conditions periodically because water or waste that is stagnant or spilled into the road area can disturb road users.

E. Customer Satisfaction Index

The author uses the Customer Satisfaction Index (CSI) method in this study. The CSI method here is used to determine the level of road user satisfaction by considering the importance of the measured road attributes. Based on the data processing results, the satisfaction index percentage is obtained. From the road user questionnaire, the results of a satisfaction index of 74.20% were obtained, which, based on the literature, value was included in the "Satisfied" category. Furthermore, in the stakeholder questionnaire, there are two satisfaction indices, namely based on performance indicators and response time. For the stakeholder satisfaction index based on performance indicators, the results of a satisfaction index of 86.51%, based on the literature, value is included in the "Very Satisfactory" category. While the stakeholder satisfaction index based on the response time obtained a satisfaction index of 86.00%, which, based on the literature, is included in the "Very Satisfactory" category.

Based on the data above, the longer the delay in handling road maintenance will result in more severe damage, and the cost of repairing road damage will also increase. Road managers should be aware of this. But it is not easy to carry out road maintenance properly if the funds provided for it are minimal. Damage to road infrastructure in various areas is estimated to increase.

In addition, the existence of natural disasters such as floods due to high rainfall intensity in some regions adds to the length and severity of road damage. While the government has limited funds, on the one hand, the need for funds for road repairs is increasing. On the other hand, considering that road infrastructure is closely related to the national economy, there is no other way to repair damaged roads to become a top priority. Road maintenance work must be carried out on all roads in excellent/medium condition and must receive priority for handling. This is intended to keep the road surface close to its original condition and is also necessary so that a heavy work project allows it to last according to the planned design life. This work mainly consists of annual routine work, periodic resurfacing, and drainage works.

V. CONCLUSION

The results showed that, in general, the level of importance of road users was relatively high, with an average of 3.87, an average level of performance of 3.70, and a CSI value of 74.20. % or satisfied. While the level of stakeholder importance on-road performance is relatively high with an average of 4.64 with an average performance level of 4.30, and a CSI value of 86.51% or very satisfactory.

Furthermore, the level of stakeholder importance on-road response time is relatively high, with an average of 4.59, an average performance level of 4.26, and a CSI value of 86.00% or very satisfactory. Attributes that greatly influence the opinion of road users and stakeholders on LSCM in the Urban Road Network are related to routine road maintenance.

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