Stakeholder Satisfaction in Long Segment Maintenance Contract: Application to a Hills-Road Network

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Abstract: Hills-road network has an essential role in maintaining the flow of transportation and logistics in mountainous 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 research 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, the hills road network in Cirebon-Kuningan-Ciamis, West Java, Indonesia, was chosen along 103.08 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 three respondents, contractors four respondents, supervised seven respondents, and road users as many as 100 respondents. The results showed that, in general, the level of stakeholder importance was relatively high, with an average of 4.22, an average performance level of 3.70, and a CSI value of 86.9.% or very satisfactory. In comparison, road users' on-road performance is relatively high, with an average of 4.44 with, an average level of performance of 4.41, and a CSI value of 86.83%, or very satisfactory. Furthermore, the importance of road users' on-road response time is relatively high, with an average of 4.42, an average performance level of 4.41, and a CSI value of 86.09%, or very satisfactory. Attributes that greatly influence the opinion of road users and stakeholders on LSCM in the Hill Road Network are related to the control of runoff water and routine road maintenance.

Keywords: Hills-road network, Long segment, Road performance

1. INTRODUCTION

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 with the role of distributing goods and services to people in urban areas [1]. Indonesia

is an archipelagic country with a combination of volcanic mountains, so it has diverse geography. The various forms of the land surface in Indonesia are divided into flat terrain, hills, and mountains.

Road terrain in Indonesia is classified according to the condition of most of the terrain slope 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 hills field is undoubtedly different from other fields. Geometrics and natural conditions significantly influence pavement and road performance in this hill's terrain [2].

Transportation facilities and infrastructure are essential elements in supporting community activities in mountainous areas. The transportation and logistics activities, mountainous terrain is usually accessed by the hills road network as it is known that road facilities and infrastructure are the main components of the land transportation system [3]. Therefore, a Pavement Management System (PMS) is needed to realize sustainable infrastructure. Internationally, PMS has made rapid progress and continues to be developed in various countries [4].

PMS has an essential role in maintaining road performance through planning, implementation, and maintenance. This process can be carried out if the stakeholders properly carry out 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 the feeling in the future [5]. Currently, in developed countries, PMS is an essential thing in road pavement management. PMS will increase rapid access between urban and rural communities, help reduce poverty and promote growth and socio-economic development of any country [6]. Furthermore, PMS that is carried out continuously and pays attention to changing field needs can positively influence the quality of road services [7].

Several developing countries, including Indonesia, have implemented PMS in road pavement maintenance. PMS implementation in Indonesia has undergone many developments, starting with conventional management and performance-based contracts. The Long Segment Maintenance Contract (LSMC) has been implemented [8]. Since 2016, the implementation 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 improvements are still needed.

Road conditions on the hill's road network are dynamic and require adaptive handling and maintenance [9]. It will be challenging to implement if road maintenance is carried out under conventional contracts. The LSMC that continues to be developed by involving all stakeholders provides better opportunities for its implementation. The choice of LSMC can be the right choice in road maintenance on the hill's road network. The LSMC has been used in road maintenance on the hill's road network for the last five years. To measure the success of this type of maintenance, customer satisfaction analysis is needed. Based on the background of the problem, this paper will discuss the analysis of Stakeholder satisfaction in Long Segment Maintenance Contract: Application to a Hills Road Network.

2. LITERATURE REVIEW

A road maintenance contract is a form of Contract for implementing construction work. Currently, the form of Contract is carried out periodically. The period of responsibility for implementing 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 a work contract between service users and service providers is a binding work contract in a short period [10].

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, the calculation of services uses the cost method without services, costs plus services, and costs plus definite services. Third, the payment system, namely monthly, for achievements and full pre-funding by service providers. The last is based on a division of tasks, namely conventional contracts, turnkey, and Engineering Procurement and Construction (EPC) [11].

A. Traditional Pavement Maintenance Contract

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 planned by another party supervised by the project manager appointed by the service user [12]. The advantage of conventional contracts is that service users in providing work have been divided among specific 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 additional 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 minimum performance indicators. Road management through the PBC approach has advantages over traditional, namely cost savings in managing and maintaining road assets [13]. Cost savings in this type of PBC contract can be realized due to incentives to the private sector for innovation and higher productivity.

In implementing road maintenance contracts, various payment methods can be made, including the type of lump-sum Contract [15]. A lump-sum contract is a contract for completing all work within a specific time limit specified in the Contract. Some of the characteristics of a lump sum contract are that the amount of the price is fixed and fixed, and it is not possible to adjust the price. In a lump sum contract, the executor fully bears all risks. 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.

*B. Long Segment Maintenance Contrac**t***

Long Segment Maintenance Contract (LSMC) is a treatment in maintaining 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, but the focus remains on-road performance and maintenance according to the scope of its activities [15].

The road maintenance program consists of the Routine Maintenance Program and the Periodic Maintenance Program. Routine Maintenance Program is a program to overcome minor damages, and need immediate treatment, such as patching potholes, closing small cracks, cleaning channels and so on with the aim of maintaining road conditions according to their service life. Meanwhile, the Periodic Maintenance Program is a program to overcome major damage such as overlaying some roads, repairing and constructing drainage channels, adding sidewalks and so on. The relationship between Routine Maintenance and Periodic Maintenance is a continuous relationship within a certain time span up to the service life limit. Routine maintenance can be carried out in a period of three to four years, or up to a certain handling limit which can still be categorized as minor damage. Furthermore, to a certain extent will require major handling, it is necessary to carry out a Periodic Maintenance program

Long Segment Maintenance Contract has four to five activity components [16]. 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 carried out by carrying out continuous handling in one road segment to get uniform road conditions, namely stable and standard throughout 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 improve the performance of road maintenance actors to achieve the national target of road stability [16]. The implementation of the Long Segment Scheme Road Preservation project is still experiencing problems in its implementation, as can be seen from the project implementation, which is subject to sanctions for late fines, poor construction quality, and delays in completing work [17].

The road service level in the LSCM is measured by a performance index consisting of several components. 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 be able to measure the success rate of LSCM implementation. In addition to a lump sum, turnkey contracts are also known for completing all work within a specific time limit with the characteristics of a fixed and fixed amount of work until all work is completed. In addition, payments are made based on the results of a joint assessment which shows that the work has been carried out following the established performance criteria.

C. Hills 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 that distributes 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 the community in urban areas. Good integration between road networks can ensure smooth traffic flow [18]. Several variables can assess the reliability of a road network, one of the most popular is measuring travel time [19].

The total length of the road network in Indonesia is 541,478 km, which consists of national roads, provincial roads, and district/city roads. High road lengths require good and sustainable asset management [20]. 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 has a consistent performance on all existing road networks.

Besides various types of the road authority, road asset management in Indonesia also faces challenges from various types of road terrain. The road network exists in various fields with different conditions and challenges. As an illustration, the road network on Java Island 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 mostly being 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 the mountainous character as a characteristic of Indonesia, the connecting road network must pass through the hills and mountains area. The road network in the hills area has its challenges because it has different types of soil and rainfall [21].

3. RESEARCH METHOD

This research was conducted using Importance Performance Analysis (IPA) and Customer Satisfaction Index (CSI). The data is collected from the hills road network that connects the north corridor with the south corridor of West Java. The case study location was chosen because the segment has a unique character. The hills road network in the Ciremai Mountain area is directly adjacent to several primary arterial roads that connect the northern corridor of the Island of Java. 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 in the case study can be seen in Figure 1.

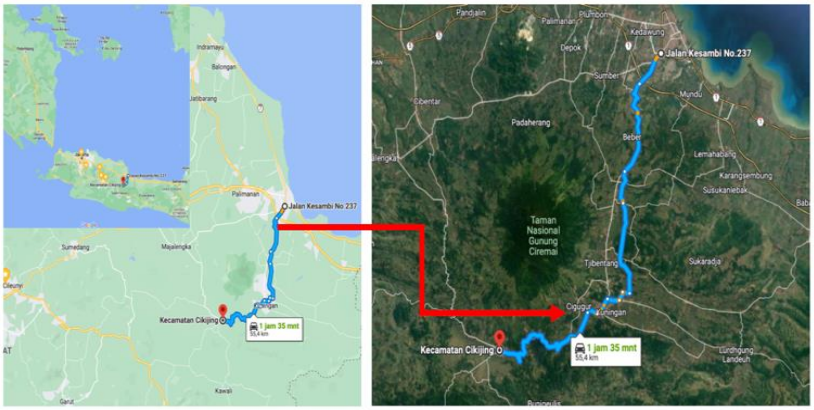

Figure 1. Location of case study

Several steps of analysis do data processing. After the statistical test is carried out, then 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 results from a comparison between the implementation performance score and the importance score. This level of conformity 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 sections bounded by two lines that intersect perpendicular to the points.

The application IPA begins with identifying 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; then, by pairing the two rank sets, each attribute is assigned to one of the four predefined performance interest quadrants. IPA has been widely applied to evaluate importance and performance value in the market, identify opportunities for improvement, and guide strategic planning efforts. In IPA, service attributes are plotted in a two-dimensional matrix based on the importance and performance of each attribute. All attributes' average or median importance and performance divide the matrix into four quadrants. The priority for improvement is then summarized based on the location of the points matrix, which can be seen in Figure 2.

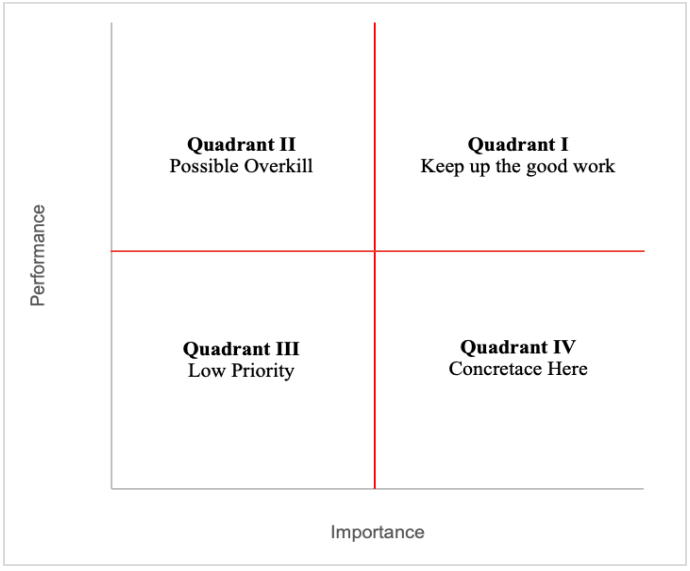

Figure 2. Importance Performance Analysis

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' a low priority. Quadrant 4 (high importance and low performance) has a management scheme for this quadrant is 'concentrate 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 regarding 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 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)

4. 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 hill's road network. One hundred one respondent's returned questionnaires. The results of the data processing were separated into two parts, namely 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 will also have different behavior and psychology in providing 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, 53 are female, or 53.00%. As for the age, since the survey was conducted on the digital platform, and most of the network users and the main labor force in the society are middle-aged, the age of the respondents is concentrated at 21-30 years old, accounting for 41.00%. As for the occupation, 48.00% of the respondents are private sector employees. As for the time per week, 45.00% of the respondents' one time. Most vehicles used by respondents are two-wheeled vehicles as much as 56%.

Table 1. Statistical characteristics of road user

Variable	Category	Frequency	Relative Frequency
Gender	Male	47	47,00%
	Female	53	53,00%
Age	Under 20 years old	35	35,00%
	21 – 30 years old	41	41,00%
	31 – 40 years old	20	20,00%
	41 – 50 years old	3	3,00%
	Above 50 years old	1	1,00%
Occupation	Government sector employees	19	11,50%
	Private sector employees	48	48,00%
	Entrepreneur	10	10,00%
	Student	17	17,00%
	Housewife	17	17,00%
	Public Transport Driver	5	5,00%
Tripper Week	1 Time	45	45,00%
	2 Times	22	22,00%
	3 Times	6	6,00%
	>3 Timer	27	27,00%
Vehicle	Car	56	56,00%
	Motorcycle/Scooter	32	32,00%
	Public Transport	12	12,50%

This research is conducted on road users and stakeholders consisting of owners, contractors, and supervision consultants. The following table can be seen the characteristics of the respondents from the stakeholder. With 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 evaluation in the future:

Table 2. Statistical characteristics of stakeholder

Variable	Category	Frequency	Relative Frequency
Gender	Male	9	64,30%
	Female	5	35,70%
Age	Under 20 years old	2	14,28%
	21 – 30 years old	6	42,85%
	31 – 40 years old	4	28,57%
	41 – 50 years old	1	7,14%
	Above 50 years old	1	7,14%
Occupation	Owner	3	21,43%
	Contractor	4	28,57%
	Supervision	7	50,00%
Education	Diploma	7	50,00%
	Undergraduate	7	50,00%
Professional Experience	1 year	2	14,28%
	2 years	7	50,00%
	3 years	2	14,28%
	4years	3	14,28%
	> 4 years	1	7,10%

B. Validity Test

The validity test of the user and stakeholder questionnaire uses the Pearson Correlation value with a significant level 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, the validity test for the stakeholders of LSCM implementation. While Table 4 and Table 5 are validity tests for road users.

Table 3. Statistical characteristics of stakeholder

id	Attribute	R-count		R-table	Remarks
		Importance	Performance		
A1	Pavement condition	0,769	0,830	0,195	Valid
A2	Shoulder Condition	0,839	0,832	0,195	Valid
A3	Drainage Condition	0,902	0,878	0,195	Valid
A4	Traffic and Road Sign	0,890	0,880	0,195	Valid
A5	Road infrastructure support	0,793	0,839	0,195	Valid
A6	Control of plant and grass	0,761	0,883	0,195	Valid

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

Table 4. Statistical characteristics of stakeholder

id	Attribute	R-count		R-table	Remarks
		Importance	Performance		
B1	Pothole	0,557	0,418	0,532	Not Valid
B2	Cracking	0,568	0, 519	0,532	Not Valid
B3	Corrugation	0,752	0, 792	0,532	Valid
B4	Rigid fault	0,322	0, 458	0,532	Not Valid
B5	Joint sealant	0,879	0, 536	0,532	Valid
B6	Roughness	0,632	0, 774	0,532	Valid
B7	Pothole of shoulder	0,729	0, 818	0,532	Valid
B8	Elevation gap	0,628	0, 703	0,532	Valid
B9	Shoulder corrugation	0,778	0, 765	0,532	Valid
B10	Ditch condition	0,441	0, 863	0,532	Not Valid
B11	Slope conditions	0,182	0, 859	0,532	Not Valid
B12	Traffic and Road Sign	0,650	0, 519	0,532	Not Valid
B13	Median and pedestrian	0,535	0, 858	0,532	Valid
B14	Guardrail	0,585	0, 613	0,532	Valid
B15	Approach road	0,662	0, 835	0,532	Valid
B16	Retaining wall	0,632	0, 792	0,532	Valid
B17	Expansion joint	0,712	0, 839	0,532	Valid
B18	Guardrail of bridge	0,635	0, 646	0,532	Valid
B19	Road and shoulder cleanliness	0,752	0, 875	0,532	Valid
B20	Control of plant and grass	0,535	0, 722	0,532	Valid

From table 4 above, there are several valid variables, namely Corrugation (B3), Joint Sealant (B5), Roughness (B6), Elevation Gap (B8), Shoulder gap (B9), Median and Pedestrian (B13) Guardrail (B14), Approach Road (B15), Retaining Wall (B16), Expansion Joint (B17), Guardrail of Bridge (B18), Road and Shoulder Cleanliness (B19) and Control of Plant and Grass (B20). 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. Statistical characteristics of stakeholder

id	Attribute	R-count		R-table	Remarks
		Importance	Performance		
C1	Pothole	0, 294	0, 324	0,532	Not Valid
C2	Cracking	0, 737	0, 617	0,532	Valid
C3	Corrugation	0, 798	0, 622	0,532	Valid
C4	Rigid fault	0,643	0, 566	0,532	Valid
C5	Joint sealant	0, 574	0, 722	0,532	Valid
C6	Roughness	0, 640	0, 642	0,532	Valid
C7	Pothole of shoulder	0, 784	0, 722	0,532	Valid
C8	Elevation gap	0, 686	0, 573	0,532	Valid
C9	Shoulder corrugation	0, 631	0, 653	0,532	Valid
C10	Ditch condition	0, 238	0, 355	0,532	Not Valid
C11	Slope conditions	0, 656	0, 712	0,532	Valid
C12	Traffic and Road Sign	0, 691	0, 597	0,532	Valid
C13	Median and pedestrian	0, 524	0, 733	0,532	Valid
C14	Guardrail	0, 596	0, 674	0,532	Valid
C15	Approach road	0, 322	0, 486	0,532	Not Valid
C16	Retaining wall	0, 701	0, 688	0,532	Valid
C17	Expansion joint	0, 833	0, 712	0,532	Valid
C18	Guardrail of bridge	0, 756	0, 658	0,532	Valid
C19	Road and shoulder cleanliness	0, 532	0, 544	0,532	Valid
C20	Control of plant and grass	0, 652	0, 656	0,532	Valid

From table 5 above, most of the variables are valid, while those that are not valid are Pothole (C1), Ditch Condition (C10), and Approach Road (C15). Therefore, the valid variable is most likely a variable 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. This study carried out reliability testing using SPSS Statistics Software version 26. 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. The results are presented in the form of a percentage. From the road user questionnaire data, the average Conformity Level (Tki) was 87.89% which, according to the literature, the value was included in the "Very Satisfactory" category. There are two Conformity Level (TKI) analyses in the stakeholder questionnaire, based on performance indicators and response time. From the stakeholder questionnaire data, it was obtained that the average Conformity Level (Tki) based on performance indicators was 99.00%, and the Conformity Level (Tki) based on the response time of 99.93%, which according to the literature the value was included in the "Very Satisfactory" category.

There is also an analysis of the importance and satisfaction level 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 three assessment attributes were in quadrant II, which means these attributes are suitable according to the user and need to be maintained in quality. Meanwhile, the remaining three attributes are in quadrant III, which means the level of importance is low and the level of satisfaction is low, so it is better to improve the quality. In Fig 3, Fig 4, and Fig 5 below, we can see the distribution of the IPA analysis carried out.

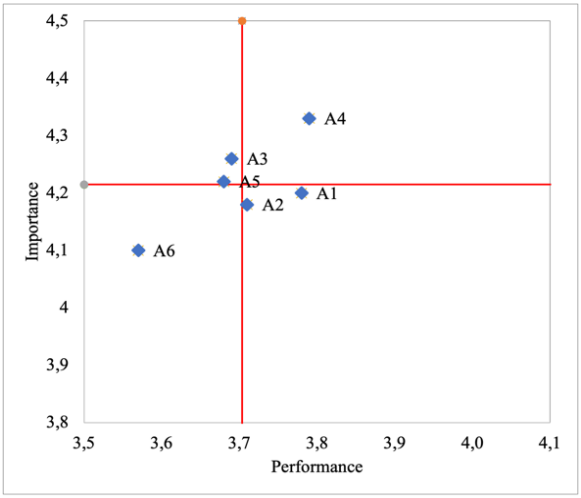

Figure 3. Importance Performance Analysis Diagram for Stakeholders

This condition is understandable because the location of the road is in the mountains, so more attention is needed to drainage and supporting infrastructure.

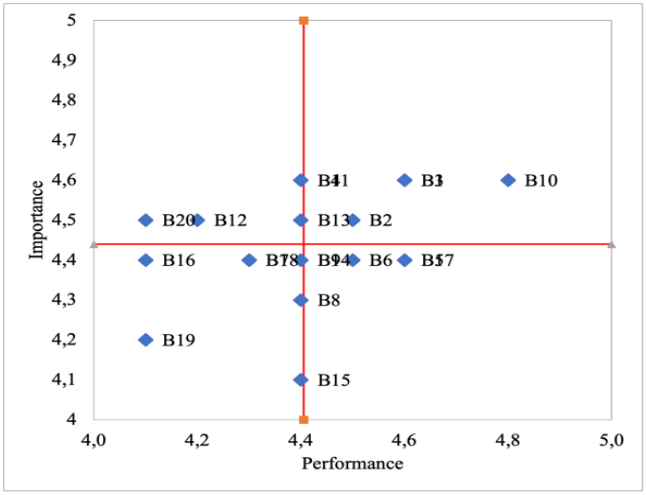

Figure 4. Importance Performance Analysis Diagram for Road User

Meanwhile, from the Importance Performance Analysis for road users, the variables Median and pedestrian (B11) and Control of plant and grass (B20) were found, which were considered necessary but not satisfactory. Median and shoulder maintenance should be a significant concern, especially in the hill road network area, because of the potential for disturbances. Grass plants are still often regarded as harmful weeds and must be eradicated, especially those in the yard or yard. This assumption makes people often ignore the potential contained in grass plants to be used. Grass plants themselves are beneficial for human life, for example, in terms of aesthetics and beauty, which are often found in luxury buildings, city parks, roadblocks, and others.

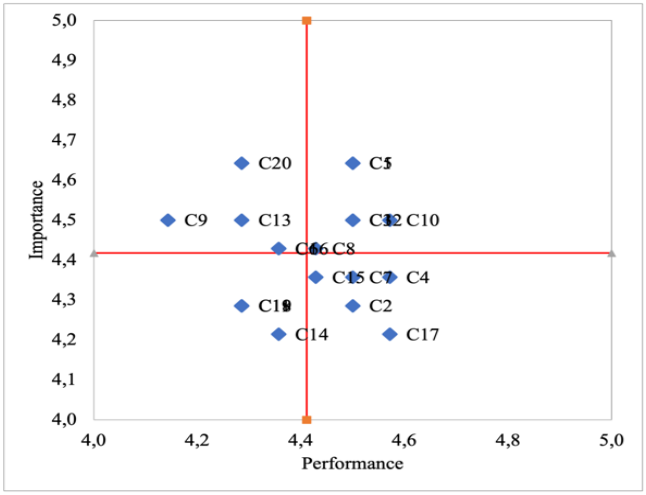

Figure 5. Importance Performance Analysis Diagram for Respond Time

Furthermore, suppose you pay attention to Figure 5. In that case, the road user assesses that there is a gap between importance and performance for Should Corrugation (C9), Median and Pedestrian (C13), and Control of Plant and Grass (C20). The three variables seem to have received less attention in the study area, even though most road users consider these conditions very necessary.

E. Customer Satisfaction Index

The author uses the Customer Satisfaction Index (CSI) method in this study. The CSI method here is used to determine road user satisfaction by considering the importance of the measured road attributes. Based on the data processing results, the percentage of the satisfaction index is obtained. From the road user questionnaire, a satisfaction index of 74.12% was obtained, which, based on the literature, the value was included in the "Satisfied" category. Furthermore, there are two satisfaction indices in the stakeholder questionnaire, namely based on performance indicators and response time. For the stakeholder satisfaction index based on performance indicators,

the results obtained a satisfaction index of 86.83%, which is included in the "Very Satisfactory" category based on the literature value. While the stakeholder satisfaction index based on the response time obtained a satisfaction index of 86.09%, which is based on the literature value, 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. Nevertheless, it is not easy to carry out road maintenance properly if the funds are minimal. Damage to road infrastructure in various areas is estimated to increase. The existence of natural disasters such as floods/landslides due to high rainfall intensity in some areas 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 road sections in good/medium condition and must receive priority for handling. This is intended to keep the road surface close to its original condition. It is also necessary to allow a heavy work project to last according to the planned design life. This consists of annual routine work, periodic resurfacing, and drainage works.

5. CONCLUSIONS

The results showed that, in general, the level of stakeholder importance was relatively high, with an average of 4.22, an average performance level of 3.70, and a CSI value of 86.9.% or very satisfactory. On the other hand, the importance of road users' on-road performance is relatively high, with an average of 4.44 with an average level of performance of 4.41, and a CSI value of 86.83%, or very satisfactory. Furthermore, road users' on-road response time is relatively high, with an average of 4.42, an average performance level of 4.41, and a CSI value of 86.09%, or very satisfactory. Attributes that greatly influence the opinion of road users and stakeholders on LSCM in the Hill Road Network are related to the control of runoff water and routine road maintenance.

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DOI: https://doi.org/10.15379/ijmst.v10i1.2692