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Quality of Service on Road User Satisfaction: Study on Surabaya-Malang Toll Road Customers

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Abstract *- Travel satisfaction can be considered as a type of road user satisfaction. This level of satisfaction is possible to arise as a result of the performance of Road User Satisfaction with the Services provided by the toll road infrastructure manager in relation to the response of road users to the road services. So this study aims to analyze the quality of service in terms of the satisfaction of users of the Surabaya-Malang toll road. Quantitative research with a community satisfaction survey approach, taking incidental purposive sampling. The sample size used the Slovin formula with a 5% margin of error, and data was collected using a Thurstone scale model questionnaire and distributed to 388 respondents. The research instrument is composed of 5 indicators and 14 sub-indicators, which are then analyzed using Importance Performance Analysis (IPA) to measure service performance and toll road user satisfaction. The results of the analysis show that the value of the Customer Satisfaction Index (CSI) for the service quality of the Surabaya-Malang toll road as a whole is 82.09 (CSI Very Satisfied Category). The Surabaya-Malang toll road management service quality index (Expectation ratio value - MSI) as a whole is 3.28 (MSI is classified as Good), and is in line with the expectations of Surabaya-Malang toll road users (CSI Satisfaction is smaller than the CSI Average satisfaction average) includes (1) road conditions; (2) structure of emergency relief assistance; and (3) street lighting problems.*

Keywords*: Quality Service, customer satisfaction, user toll road*

I. INTRODUCTION

Satisfaction is an important aspect that is often ignored in the implementation of toll road service delivery. Toll road users, of course, hope that there will be reciprocity from toll road managers so that they can continue to improve their services to toll road users, this is because toll roads are subject to toll fees when using them. Because service conditions such as the physical condition of toll roads and toll road supporting facilities are still a major problem for toll road users (Yana, and Salasa (2019). Based on Government Regulation No. 15 of 2005 concerning toll roads it is explained that toll roads have a level of service to security and higher convenience compared to public roads and can serve large volumes of long-distance traffic flows. The purpose of implementing toll roads is to increase the efficiency of the distribution of goods and services in order to support increased economic growth in the East Java region. In practice, toll roads have a minimum service standard (SPM) for toll roads that have been regulated in the Minister of Public Works Regulation Number 16/PRT/M/2014 concerning minimum service standards, as the government's effort to protect toll road users.

Likewise the management of toll roads, such as the Pandaan-Malang Toll Road in 2022 has changed to PT Jasa Marga (Persero) Tbk or the private sector as the manager of toll roads, namely PT Jasamarga Pandaan Malang (PT JPM). It should be noted, PT JPM is a Toll Road Business Entity (BUJT) for the 38.5 kilometer Pandaan-Malang Toll Road section which has been fully operational since 2020 with concession rights for 35 years (2017-2052). So far, Astra Infra has become a strategic partner of Jasa Marga in several other toll road concessions. As a private company, PT. Jasa Marga and ASTRA Infra share the same vision in realizing professional, efficient and sustainable toll road operations, as well as prioritizing the best service to road users by strengthening the toll road business portfolio by investing in the Pandaan-Malang Toll Road section which is a form of corporate endeavor in 2021 to grow and contribute in the midst of a pandemic. As is known, the Pandaan-Malang Toll Road has been fully operational, thus contributing to increasing connectivity in the East Java region, especially access to tourist areas, so as to encourage regional economic growth. Among other things, it also

supports access connectivity, especially for the Singosari Special Economic Zone and Abdul Rachman Saleh Airport in Malang City. Thus increasing the economy in the East Java region in the tourism sector, such as the Prigen Tourism and Safari Park Area, the Wonosari Tea Garden, Singosari Temple, and the Batu Tourism Area.

Public roads that are part of the road network system and as a rational use are required to pay a toll are called toll roads. Toll roads are part of the national road network system and are integrated with an integrated transportation system (UU No. 2 of 2022). Tol stands for tax on location, so that everyone who uses a motorized vehicle is required to make toll road payments. The construction of toll roads has played a role in increasing the local economy through increasing the participation of micro, small and medium enterprise products in toll road business spaces and rest areas. In order to accommodate the local economy, toll road services can be developed by adding supporting facilities in the form of local economic promotion areas, so as to connect limited access to off-highway roads. Government Regulation Number 15 of 2005 concerning Toll Roads article 2 states the aims, objectives and scope of toll road management, namely: 1) Toll road operations are intended to achieve equitable development and balance in regional development; 2) The implementation of toll roads aims to increase the efficiency of distribution services in order to support increased economic growth, especially in areas that have a high level of development; and 3) The scope of this Government Regulation includes arrangements for the operation of toll roads, BPJT, as well as the rights and obligations of business entities and toll road users. The amount of toll rates is different for each class of vehicle and is calculated based on the ability to pay toll road users, the profit margins on vehicle operating costs and investment feasibility (PP No. 15 of 2005). So that the management of this toll road is a part of the service industry process that relates to community needs.

As a public sector business entity, toll road managers provide service facilities for road users, especially on certain days such as holidays and religious holidays. Several rest areas on the Surabaya-Malang toll road have various facilities, ranging from gas stations, toilets, places to eat, to mosques. In addition, some of the rest areas also have beautiful natural views. Rest area 754A which is on the Surabaya toll road to Gempol. This rest area includes a type A rest area with facilities for Public Fuel Filling Stations (SPBU), mosques, places to eat, coffee shops, toilets, minimarkets and Automated Teller Machines (ATMs), with ample parking space. Rest area 753B, which is on the Gempol route to Surabaya, is included in the Sidoarjo Regency area. This rest area is also included in the type A rest area with the same facilities as the 754A rest area. Rest area km 66A. This is a rest area for those of you heading to Malang. Including the type B rest area, where gas stations are not available but the facilities are quite complete, although simple, such as toilets, mosques, places to eat, and mini markets. The parking area is also quite large. Rest area km 66B. This resting place is still relatively new and is still under construction, but it can be used. Gas stations are not available but provide toilets, a mosque, a mini market and places to eat. Apart from that, service facilities are provided through one 24-hour call center at jasa marga Group Number 14080. In addition, the Toll Road management provides services in the form of the Travoy Travoy application, an application released by Jasa Marga in 2019 to access information about toll roads, one of which is toll rates. Twitter @PTJasamarga and the Travoy 4.1 application for iOS and Android users.

With regard to this description, this study aims to examine the quality of service in the management of the Surabaya-Malang Toll Road through the road user satisfaction level approach. This is in accordance with Law Number 25 of 2009 concerning public services article 15 regarding the obligations of public service providers, namely providing quality services in accordance with the principles of public service delivery, carrying out services in accordance with service standards. Decree of the Minister of Administrative Reform No. 25 of 2009 states the definition of public service is all service activities carried out by public service providers as an effort to fulfill the needs of service recipients and the implementation of statutory provisions. Public service providers are work units in government agencies that directly provide services to recipients of public services (Putra, Wicaksono, & Prayitno, 2022). While recipients of public services are people, communities, government agencies and legal entities. Decree of the Minister of Administrative Reform Number 58 of 2005 classifies three types of services from government agencies as well as BUMN/BUMD. The grouping of these types of services is based on the characteristics and nature of the activities and service products produced, namely, administrative services, goods services, and services.

Evaluation of road service performance is carried out by assessing the operational conditions of traffic flow, which includes the level of road service and road capacity. However, this must also be complemented by an analysis of road service performance in the form of an assessment of road user satisfaction. The importance of evaluating the performance of road services in maintaining optimal service quality is a fundamental process that must be implemented.

II. METHOD

This survey research uses a descriptive quantitative approach that collects data directly from toll road users, and document data on the number of road users, and PT. Jasa Marga Transjawa Toll. The document data shows that the average volume of private and public transport vehicles leaving the Waru Gunung toll gate and getting off at the Malang toll gate is 12,958 and those leaving the Malang toll gate entering the Waru Gunung toll road are 13,952 under normal conditions in February 2023. Furthermore, the number of respondents is determined through the Slovin formula as follows.

$$n = \frac{12.500}{1 + Ne^2}$$

From the Slovin formula, the margin of error is set at 5%, with a precision of 3%, so that 388 people are taken as a sample. Furthermore, the data was collected through a questionnaire designed with indicators as stipulated in the Ministerial Decree regarding community satisfaction surveys. The Community Satisfaction Index can be defined as a value that indicates the level of public satisfaction with the services that have been provided in public services. To find out the size of the customer satisfaction index (CSI), it can be done with the following steps (Sulistiani, 2021).

Determining the Mean Importance Score (MIS), or the average value of the interests of each consumer or user of the Surabaya-Malang or Malang-Surabaya toll road

$$\boldsymbol{MIS} = \frac{(\sum_{i=1}^{n} \boldsymbol{Y_1})}{\boldsymbol{n}}$$

Information

n = Number of Consumers

Yi = Importance Value of the i-th Attribute

Determine Weight Factors (WF). This weight is the percentage of the MIS value per attribute to the total MIS of all attributes.

$$\boldsymbol{WF} = \frac{\boldsymbol{MISi}}{\sum_{i=1}^{n} \boldsymbol{MISi}} \boldsymbol{x}\ \mathbf{100\%}$$

Determine the Weight Score (WS), this weight is the multiplication between WF and the average level of satisfaction (X), (Mean Satisfaction Score = MSS)

WSi = WFi x MSS

Determining the Community Satisfaction Index (CSI)

$$\boldsymbol{CSI} = \frac{\sum_{i=1}^{n} \boldsymbol{WSi}}{\boldsymbol{HS}} \boldsymbol{x}\ \mathbf{100\%}$$

Information

HS = (Highest scale) Maximum scale

The CSI value is divided into 4 criteria from dissatisfied to very satisfied according to Permenpan No. 16 of 2014, regarding the Community Satisfaction Survey which comprehensively sets out the following criteria.

Table 1. Criteria and value categories

Interval Value	Conversion Interval Value	Category
1,00 – 1,75	25,00 – 43,75	Not satisfied
1,76 – 2,50	43,76 - 62,50	Less satisfied
2,51 – 3,25	62,51 – 81,25	Satisfied
3,26 – 4,00	81,26 – 100,00	Very satisfied

Furthermore, an inferential analysis was performed which was used to determine the intensity of the level of community satisfaction with the community background which was reflected by the research respondents. Sugiyono (2018) explains that inferential statistics is a method that can be used to analyze small groups of main data or samples taken from the population to forecasting and drawing conclusions on the main data group or population. Inferential statistics is a summary of all methods related to the analysis of some data and then arrives at forecasting or drawing conclusions about the entire parent data (population).

III. RESULT AND DISCUSSION

A. Result

Through the data collected through questionnaires, several series of analysis processes have been carried out, namely testing the validity and reliability of the instrument as well as data analysis and data reduction according to the needs of the analysis. From the questionnaires collected, the characteristics of the toll road user respondents can be described as shown in the following graph.

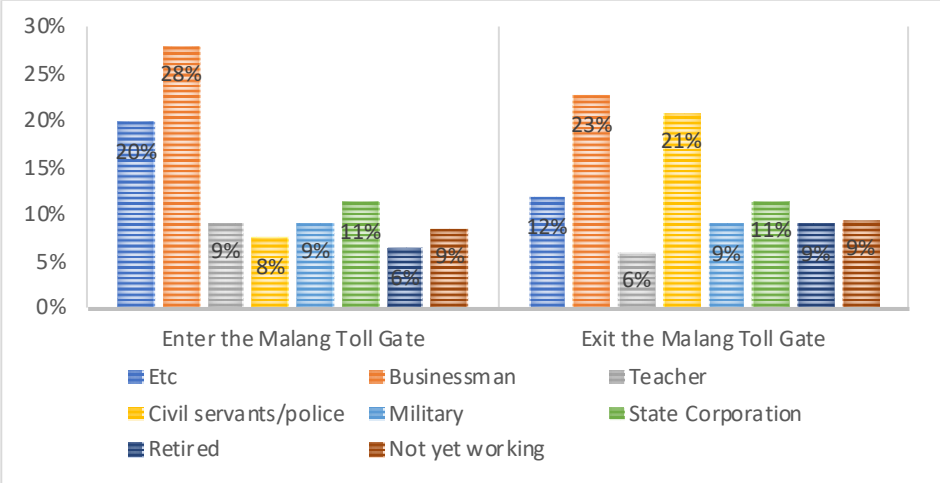

Figure 1. Respondent's work in terms of location
(Source: questionnaire data, processed by researchers)

The data in the graph above can explain the characteristics of Surabaya-Malang or Malang-Surabaya toll road users who volunteer to fill out the questionnaire. The graph shows that most of the toll road users in this study are business actors, then civil servants and police and other types of work. Likewise respondents with other occupational backgrounds, such as teachers or company employees. The graph also explains that the composition of the sampling is the same, between toll road users leaving the Malang toll gate, and respondents entering the Malang toll gate with the aim of going to Surabaya.

From the data filled in by the respondents it is also known the intensity of use or utilization of toll road access by respondents as illustrated in the following graph.

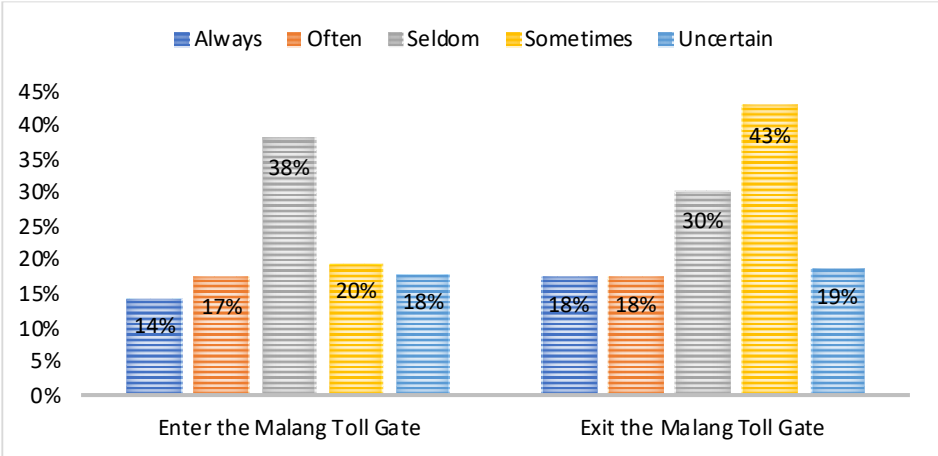

Figure 2. Intensity of use of toll roads in terms of location
(Source: questionnaire data, processed by researchers)

Always, i.e. users pass toll roads with an intensity of once a week/more; and frequent is the use of toll roads as much as between 2-4 weeks; while infrequent is to pass the toll road about once a month, and occasionally, namely to pass the Malang-Surabaya toll road about 2-4 times a year; as well as according to

conditions, is passing toll roads with uncertain intensity and not routinely. Respondents from the direction of entering Surabaya to Malang stated that the intensity was relatively rare, while those leaving the Malang Toll Road towards Surabaya stated that the intensity was sometimes and rarely. Furthermore, the intensity of use of this toll road can be known further from the purpose of utilizing toll road facilities.

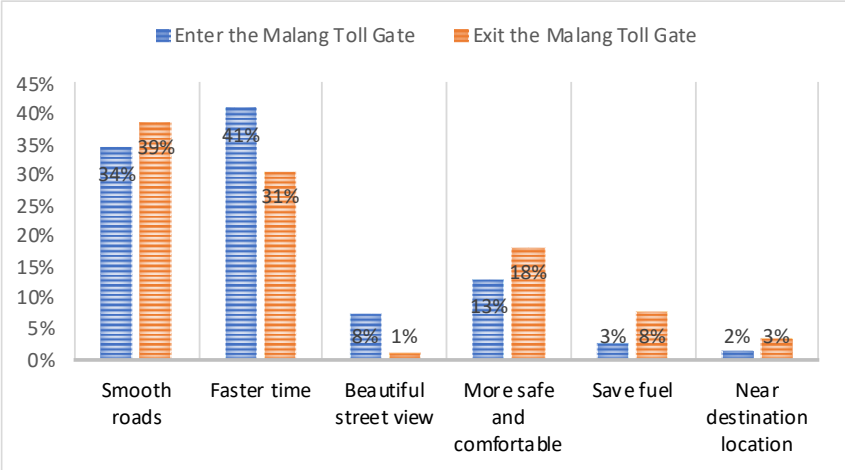

Figure 3. The purpose of passing the toll road is viewed from the location of data collection (Source: questionnaire data, processed by researchers)

Referring to the main indicators collected, it can be seen that respondents from Surabaya who entered the Malang toll road gave the same reasons as respondents who left the Malang toll road for Surabaya. The main reasons are smooth road access, relatively shorter travel time, and traffic comfort and safety issues on toll roads passing through toll roads which are better, safer than arterial roads outside toll roads which are congested and traffic accidents often occur. Another reason given by respondents, especially from the direction of Surabaya to Malang, is that the road views along the toll road are quite beautiful, feel beautiful and not boring. Besides that, the reasons given were to save fuel for vehicles and the intended location was closer to the toll gate.

Table 2. MIS and CSI Analysis of Service Quality for the Surabaya-Malang Toll Road

Toll Road User Satisfaction Index	MIS	CSI
Ease of entry	0,25	6,19
Ease of transaction	0,26	6,45
Toll gate queue	0,18	4,58
Officer alertness	0,24	6,11
Emergency help	0,25	6,16
Serving Help	0,25	6,34
Sign Board (Roadmap)	0,23	5,77
Road environmental conditions	0,21	5,34
Street lighting	0,24	5,88
Smooth running	0,23	5,68
Physical condition of the road	0,23	5,67
Mileage	0,23	5,73
Complaint handling	0,24	5,92
Traffic information	0,25	6,26
Total	3,28	82,09

Table 2 shows the aspects of officer vigilance and road environmental conditions that have very good toll road management performance criteria in the realm of service quality. Then the value of the smoothness of

the trip shown in the MSI value which shows efforts to regulate traffic flow and manage queues at the exit and entry of the toll road under normal conditions and on holidays is quite good. The value of service quality is also supported by the CSI value which shows the level of satisfaction of toll road users who are classified as very satisfied in these three aspects.

On the other hand, the aspect of service quality that shows performance that is still lacking is required in the CSI value at ratings 10 to 12, namely in the physical condition of the road aspect which according to toll road users still needs to be repaired because it is bumpy or cracked. One of the road condition problems that is meant is the road material, which reflects light due to spotlights from the opposite direction when conditions are wet. Then traffic information which, according to the statements of some toll road user respondents, is considered a bit confusing, the writing is not clear from a long distance; and serving help that is seen as slow, or the clerk is not in place. The help that road users need is assistance when road users experience problems with engine damage or problems with leaky wheels, in which case there is no adequate service. Then there is the problem of street lighting, according to road users, there are times when the atmosphere of street lighting is lacking, it is very dark, and the anti-fog lights installed are inadequate.

Referring to this explanation, referring to the indicators as stipulated in Law Number 25 of 2009 concerning public services article 15 regarding the obligations of public service providers, namely providing quality services in accordance with the principles of public service delivery, carrying out services in accordance with service standards. Decree of the Minister for Administrative Reform Number 25 of 2009 states that the definition of public service is all service activities carried out by public service providers as an effort to fulfill the needs of service recipients and the implementation of statutory provisions.

Furthermore, in the process of analyzing the satisfaction of toll road users, instruments are also included that measure tariffs or entry fees. This refers to the policy regarding toll rates according to distance, and as quoted from the auto2000 page, "Toll" is an acronym for "Tax on Location" which means that every vehicle that crosses a toll road is a tax object that must pay its taxes at a predetermined toll rate. . Many are of the opinion that some toll roads in Indonesia will increase their tariffs per year, which is often a source of complaints about costs which are sometimes felt to be not in proportion to the conditions or toll facilities available. For this reason, the results of the analysis of satisfaction of toll road users can be seen by including tariffs as shown in the following graph.

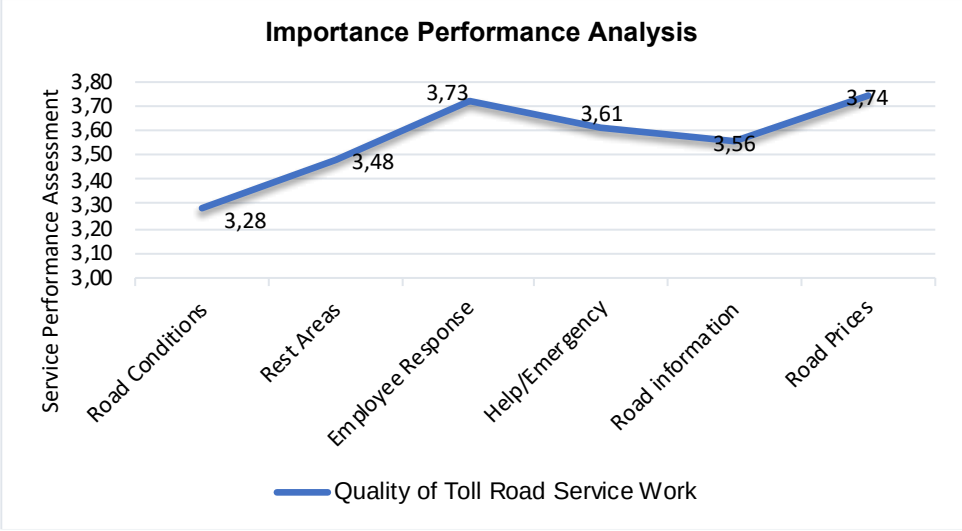

Figure 4. Analysis of Service Quality for the Surabaya-Malang Toll Road
(Source: questionnaire data, processed by researchers)

The results of the performance analysis on service quality show the service quality index, especially on road condition indicators that have met the minimum service facility requirements. Toll Road Minimum Service Standards are a measure of the type and quality of service that must be achieved in the implementation of toll road operations (Public Works PM Number 16/PRT/M/2014 2014). The Ministerial Regulation is used as a reference for Toll Road Business Entities in providing services to toll road users. It is known from the graph that road conditions relatively get the lowest score, but already meet the conversion value standard for toll road user satisfaction. This GHal is supported by the average response value of toll road officers who get a good impression,

and the toll road fare price which is considered in accordance with the facilities obtained or expected by toll road users.

The quality of service is a reflection of the performance of the toll road manager, namely PT. Jasa Raharja Pandaan Malang (PT JPM) is synergistic with the level of satisfaction of toll road users. This means that a relatively high level of service quality is followed by a level of satisfaction from the community or users of the Surabaya-Malang toll road who are also very satisfied with the toll road services and facilities provided. The level of satisfaction of the community using this toll road can be seen from the results of the CSI (Customer satisfaction index) analysis as shown in the following graph.

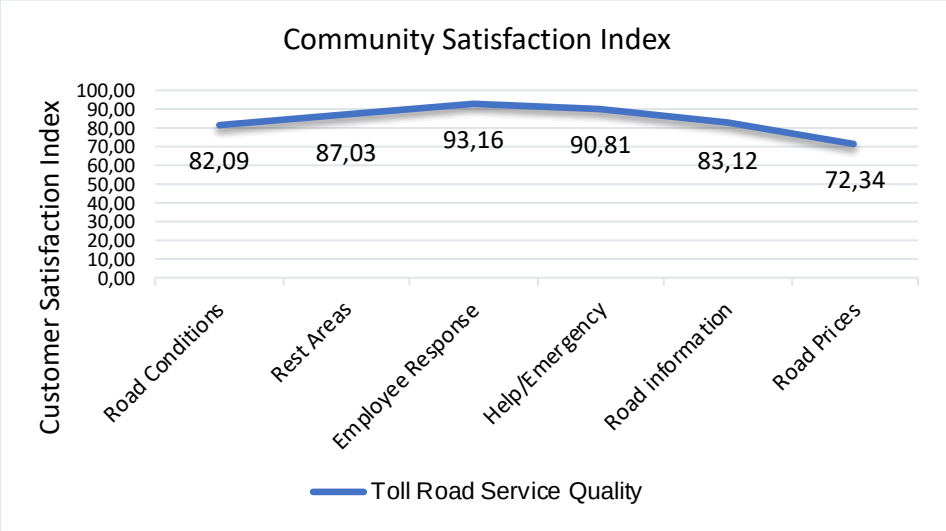

Figure 5. Analysis of the value of user satisfaction on the Surabaya-Malang toll road (Source: questionnaire data, processed by researchers)

The graph above explains that the service facilities which are seen as giving the greatest satisfactory impression are the alertness of toll road officers, and the readiness of officers in providing assistance or assistance services. These two indicators and other indicators are in principle interrelated, such as road condition indicators, road information, and the provision of rest area facilities. It is known that roads are infrastructure to support various activities and human needs in terms of mobility interests in order to achieve economic and non-economic goals. Mobility will be created well if the movement of the population is increasingly integrated with one another in a system. Indirectly, roads function as transportation infrastructure for economic activities, namely supporting economic equity as connecting roads. Thus, accessibility for the community will be easier to achieve the desired goals.

B. Discussion

Based on Law Number 2 of 2022 Concerning Roads, article 11 paragraph (1) states that, "Every road must have parts of the road which are spaces used for mobility, road construction, the need to increase road capacity, the need to increase road capacity, and safety for road users" (Utomo, et.,al, 2022). Sections of the road determine what is meant, namely: 1) Road Benefit Space (Rumaja) Road benefit space is space along the road which is limited by a certain width, height and depth determined by the road administrator and used for road bodies, roadside channels and road boundaries. protection (PM Public Works No. 20/PRT/2010 2010); 2) Road-owned space (Rumija) Road-owned space is the road-use space and a certain line of land outside the road-use space that is provided for road-use space, road widening, additional traffic lanes in the future as well as the need for space to secure the road and is limited by width. , certain depth and height (PM of Public Works No. 20/PRT/2010 2010); 3) Road Monitoring Room (Ruwasja) Road monitoring room is a certain space outside the road-owned space whose use is supervised by road administrators so as not to interfere with the driver's free view, road construction, and road functions (Muatan, Rifai, & Handayani, 2023).

Based on Figure 4, it can be seen that the service quality attribute that has the highest weighted score is the service quality attribute. This indicates that the completeness and clarity of signs and information boards to read and the completeness and clarity of perkilometer markers to read have better performance than other service

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quality attributes. While the attribute of service quality that has the lowest score is the attribute of presence and Readiness of Patrol Officers in Securing the Malang-Surabaya road which has a value of 3.73. This indicates that the attributes of the presence and Readiness of Patrol Officers in Securing the Surabaya-Malang toll road have an unsatisfactory level of performance compared to other service quality attributes. However, if it is related to the results in Table 2, the attributes of the Presence and Readiness of Patrol Officers in Securing the Surabaya - Malang toll road do not really affect the level of satisfaction of toll road users. Based on Table 2, it can also be seen that the total weighted average value is the total value of the weighted score value.

The graph (Figure 4) can also explain that in general, the main indicators considered for measuring toll road performance are the physical condition of the toll road and travel time which is closely related to traffic conditions. Although it has not been defined as an important factor in toll road performance, user perception has been widely used as a measuring tool to improve service quality in many service sectors. This is in accordance with the concept put forward by Resdiansyah, et., al. (2019) states that there are 6 elements that contribute to measuring the road user satisfaction index, which include: (1) road safety of 17%; (2) road infrastructure components by 26%; (3) environmental impact of 17%; (4) services for road users 12%; (5) social factors of 14%; and (6) traffic management by 14%.

The results of the analysis of the quality of service for the Surabaya-Malang toll road have illustrated that the implementation of Toll Road Minimum Service Standards (SPM) must be implemented by Toll Road Business Entities in order to improve services to toll road users. Based on the Regulation of the Minister of Public Works Number 16/PRT/2014 concerning Minimum Toll Road Service Standards, article 3 states, Toll Road Minimum Service Standards include service substance, one of which is the condition of the Toll Road. Basically, the condition of toll roads consists of 3 (three) indicators, namely: a) Derangement, meaning that the standard toll road error level that must be met is more than 0.33 Mu; 2) Unevenness, meaning the level of comfort in driving, while the benchmark used for this aspect is the amount of IRI which must be less than or equal to 4 m/km; 3) There are no holes, meaning that visual monitoring is carried out which includes observing grooves, cracks, subsidence, release of wave grains, holes and edge damage/additions. In addition, the quality of service with indicators that are part of the community satisfaction assessment is about accessibility, which is a measure of the ease of traveling from the location of residence to the location of the service needed. Indicators for accessibility include transaction speed and the number of toll booths (Vinayaka, & Kurugod, 2017). The benchmarks used are divided into open transaction systems and closed transaction systems. Mobility is a measure of a person's ability to move. The indicator for this service aspect is the speed of handling traffic obstacles which includes patrol observations and tow vehicle patrols with a requirement of 30 minutes/observation cycle (Arganata, & Swasto, 2022).

The level of user satisfaction for the Surabaya-Malang toll road to examine the quality of this service is in accordance with research reported by Purnomo and Wibawa (2020), that the level of satisfaction of toll road users for the services of PJR Ditlantas Polda East Java personnel uses Importance-Performance Analysis (IPA) and The Customer Satisfaction Index (CSI) shows good quality and satisfied people. Research by Faisal, Mulyono, and Utomo (2022), identified the performance of road services in terms of the aspect of the level of importance and level of application of road infrastructure components in the perception of road users, so that priorities for handling road service performance can be identified which have not met the expectations of road users. In improving the quality of road services, road user satisfaction can also be used as a reference to determine the actual road conditions and the handling needed to increase the comfort of road users. Vinayaka, and Kurugod (2017), explain that the measurement of road user satisfaction is a form of assessment of the achievement of service quality within the scope of the performance of road infrastructure components and trip satisfaction. Satisfaction of road users with the performance of road services is strongly influenced by the choice of the mode of travel used. The choice of travel mode on trip satisfaction is related to travel time, vehicle speed, vehicle operating costs (BOK), and safety while traveling.

According to Vinayaka and Kurugod (2017), a road user satisfaction survey was conducted to determine road user satisfaction with road services provided in current conditions. The data obtained will help road management agencies and related road operating agencies as a consideration for carrying out appropriate handling to improve the quality of road services today and in the future. Arganata, and Swasto (2022) state that the HCM-2000 and HCM-2010 guidelines provide a new 2-indicator approach for conducting capacity analysis and road service levels, namely the level of service and quality of service. The level of road service is a qualitative measure of road network traffic conditions by using indicators of speed and travel time, while service quality is an indicator of satisfaction of road users with their travel conditions.

IV. CONCLUSION

The results of the data analysis of the Customer Satisfaction Index (CSI) method stated that the overall user satisfaction index (CSI) rating for Surabaya-Malang toll road users was 82.09 (CSI Very Satisfied Category). The performance of road services that have not met the expectations of road users (CSI Satisfaction is smaller than the average CSI Satisfaction) includes; utilization of part of the road space; and road equipment. The Surabaya-Malang toll road user satisfaction index (Expectation Value - MSI) as a whole is 3.28 (Service Quality MSI is classified as Good), and is in accordance with the expectations of Surabaya-Malang toll road users (CSI Satisfaction is smaller than the average CSI Satisfaction average) includes: (1) road conditions; (2) structure of emergency relief assistance; and (3) street lighting problems.

As a low MIS value is the problem of street lighting, the alertness of officers in providing assistance in conditions where road users need assistance due to a broken vehicle engine or a flat wheel problem. It is suggested that toll managers provide mechanic assistance services as well as handling punctured tires along the Surabaya-Malang toll road route. It is also recommended that lighting problems get attention, especially on relatively dark trails due to environmental conditions that are flanked by cliffs or forests, as well as foggy areas. It is also suggested for future researchers to examine aspects of toll road user satisfaction from the aspect of service quality which refers to various business management theories by imposing various indicators through a more comprehensive research study.

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