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Research Paper

Asset Management Analysis to Road Equipments in Traffic Order Zone (*Kawasan Tertib Lalu Lintas*) of Probolinggo City, East Java Province

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ABSTRACT: *The constant problems encountered by local government while managing regional assets in general are circulating in areas of asset management implementation that inaccordance with the planning, physical and legal procedures of regional assests management (have not been implemented in proper and correct way), also disoderlies in managing asset database. All of which resulting in less optimal management conduct by the local government while using these assets, or in worsen situation, causing local government experience difficulties for utilizing these assets in the future. To achieve an optimum goal of asset management, through a planned, integrated manner and stable ability that able to provide desired data and information needed in short time, requires a supportive information system to decision-making (decision supporting system) on assets or commonly referred as Asset Management Information System (Sistem Informasi Manajemen Aset/SIMA). By an information system that able to support the regional assets management through efficient and effective way, it will lead to policy transparency in the regional assets management. The road equipment assets of Probolinggo city is in great need to be studied for identifying problems and formulating actions to be taken to solve the problems.*

Applied method in this research was a quantitative method with data collection by questionnaries to 40 respondents as the sample size. The method of data analysis was a linear regression method aided by Statistical Package for the Social Sciences (SPSS) program. As a result, the asset management analysis found problems of (1) road equipment asset management supervision is not conducted in optimal way, (2) type of problems affecting the asset management are unreliable (weak) data collection, minimal maintenance budget, lack of labor/human resource capacity, the absence of an integrated asset information system, and low coordination between sectors, and (3) asset management can bring a positive impact on assets security and supervision.

KEYWORDS: *Asset Management, Road Equipment, Road Traffic Order.*

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I. INTRODUCTION

Management of state assets which often referred as State Property Management is described in Government Regulation Number 27 of 2014 regarding the State/Regional Property Management as amended by Government Regulation Number 28 of 2020 concerning Amendment to previous regulation (number 27 of 2014) on subject of State/Regional Property Management. State or regional property is all materials purchased or obtained at the expense of the state revenue and expenditure budget or derived from other legitimate acquistions. Siregar describes the objectives of state management are efficient utilization and ownership, maintain economic value and objectivity in the supervision and allocation control, also use and transfer of control. [1]

Concept of asset management has widely adopted to optimize a decision-making strategy, by balancing elements of cost, risk and workperformance from companies with numerous or dense assets. Yet, any changes in the way of utilizing physical assets of different entities certainly have impact not only in the life cycle but also in the ongoing maintenance risk of the assets. So, the asset management is needed to ensure safety, availability, reliability also provision of products work in accordance with the required quality. Lima, et al., further argues that asset management enables the organization to create value and sustainable benefits of their assets. It is attainable by, among other strategies, through proper maintenance implementation. [2,3,4,5,6,7]

General problems faced by local government in relation to regional assets management, is caused by unsuitable asset management implementation with the planning, the procedures for managing regional assets (both in physical and legal standpoints) and have not been proper and correctly implemented. Also lack of order in managing asset database, which resulted in less than optimal asset management conduct by the local government (or worse, causing local government to experience difficulties for utilizing assets in the future). To achieve an optimum goal of asset management, by a planned, integrated manner and stable ability in providing the desired data and information needed in short time, requires a supportive information system to decision-making on assets (decision supporting system) or commonly referred as Asset Management Information System (*Sistem Informasi Manajemen Aset/SIMA)* Therefore, an information system that able to support the regional assets management through efficient and effective way leading to transparency of policies in the regional assets management is needed in the object of study; the road equipment assets in Probolinggo city which need to be researched to identify problems and action to be taken.

So far, discussion related to analysis of road equipment asset management in Traffic Order Area of Probolinggo City, East Java Province has not been carried out by many researchers, therefore, problem raised in this study are: (1) how the road equipment asset management in the Traffic Order Zone of Probolinggo city is conducted? (2) what problems affect the management of road equipment assets of Traffic Order Zone of Probolinggo city? (3) How does asset management affect asset security and supervision?

II. LITERATURE REVIEW

2.1. Management of Assets

Asset management derived from two words of "Management" and "Asset" as further explained by George R. Terrry as "Management is a distinc process consisting of planning, organizing, actuating and controlling, utilizing both in science and art, and must be followed in order to accomplish predetermined objectives". Therefore, management is defined as a distinct process consisting of planning, organizing, implementing and controlling, utilizing in each scope of science and art, and must be followed in order to achieve the predetermined objectives.

Asset management area encompasses many processes of planning, designing, organizing, using, maintaining and disposing of assets, in addition to asset monitoring. This process is carried out in systematical way and structurized throughout life cycle of the assets. Asset management attempts to optimize the use of assets in order to provide benefits in area of service delivery and financial return. A reliable asset management is able to minimize costs and maximizes asset availability and asset utilization. A term of asset management within the scope of government environment is known as State/Regional Property Management. Britton in Siregar defines good asset management comes in terms of measuring the value of properties (assets) in monetary term and employing the minimum amount of expenditure on its management. [1]

From several literature understanding above, asset management then can be defined as a series of decisions to manage wealth in optimum way through minimizing ownership cost, maximizing availability and use of assets (by process of planning needs, procurement, inventory, ownership or legal audit, assessment, operation, maintenance, disposal, revitalization, transfer and supervision of assets) in support to the organization's goals for serving community, as well as possible to be conducted in an environmental friendly manner.

Research on relationship of asset management or optimization and utilization of assets owned by regional government are very limited in number, thus, this paper uses library research method (literature review) to study what activities should be done within the scope of regional government assets management, to be compared with current situation or type of activities being implemented by the local government at present time. The implementation of Law Number 17 of 2004 regarding State Finance gave a mandate to regional government to prepare a comprehensive financial report where the balance sheets must reveal the regional government financial position (which can not be avoid) and becomes the end result of regional financial management process. Further, Siregar stated that there are four (4) interconnected and integrated work stages within asset management (asset inventory, asset legal audit, asset valuation and asset identification). Moreover, Hidayati said the asset management is very necessary to overcome property problems in regional government environment as the reflection of economization, efficiency, and effectiveness act where the classical problem in property asset management is unclear legal status of the property. It means the party or company with legal ownership right to the assets often become disputal matter between existing units or parties, and the lack of efficiency culture in asset management results in less profitable (suboptimal) contractual relationships, also no relevant relationship between government as the legal owner to its tenants and managers. [8,9]

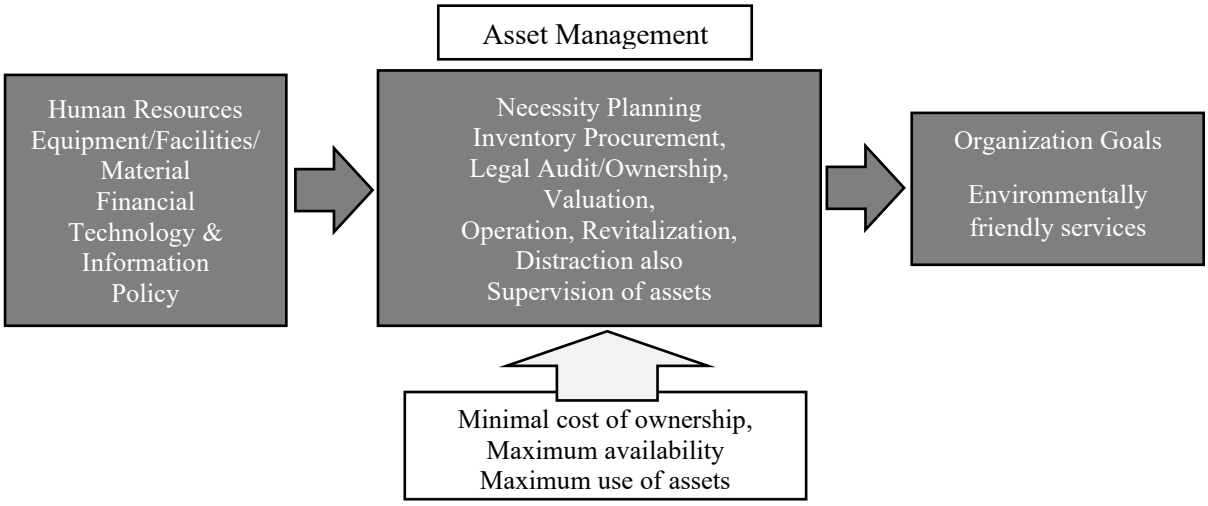

Figure 1. Problem Solving Framework

Property is not only an investment but also an asset. Definition of an asset can be found in Barron's Dictionary of Real Estate Terms which defines as "something having value". This definition when applied to property then can be explained in several ways such as:

1. Owns an economic value related to the highest and the best use values.
2. Able to generate income from operating the property.
3. Have a good physical, functional and control rights.
4. Long economic life-time.

2.2. Optimizing Asset Utilization

Asset optimization is a work process within asset management scope aims to optimize the location, value, volume, legal, economic and physical potentials of the asset. At this stage, assets from state government are identified and grouped based on their potentials. Optimizing asset utilization is a relationship between service utility and the profit returns. From the statement, it can be concluded that asset optimization is maximum level of asset utilization where it can produce more benefits or also generate income. Analysis of optimization of asset use and utilization is used to identify and sort assets that are included in operational assets or non-operational assets. A more in-depth study is conducted for operational assets to determine whether these assets have been optimally utilized or not, meanwhile for non-operational assets, an analysis is conducted to the existing condition of an asset in this category. To determine whether the utilization has reached optimum, it is necessary to examine the economic aspect of the asset utilization. As stated by Siregar, optimizing an asset requires a strategic formulation to minimize and eliminate threats from environmental factor, and for type of assets that unable to be optimized, the causes must be identified. Further stated by Siregar, optimizing asset management requires maximizing asset availability and utilization but minimizing cost of ownership. Optimizing an asset can be done through Highest and Best Use Analysis by minimizing or eliminating threats posing by management of these assets. Therefore, asset with idle capacity status also can be optimized. Siregar added with the general objectives of asset optimization [8,10]:

1. Identify and inventory all assets, these include listing the form, size, physical, legal, and market value of each assets which reflecting its economic benefits.
2. Asset utilization. At this stage, the asset manager must determine whether the assets has been utilized according to its intended use or not.
3. An establishment of information and administration system to achieve afficiency and effectiveness in asset management.

Optimizing an asset or asset optimization can be conducted in two ways: studies of asset optimization and investment intermediary. The optimization study can be done through (among other methods) asset identification, asset database development, Highest and Best Use of assets studies and asset optimization strategy development. [8]

Highest and Best Use (HBU) defined as the most feasible, possible, and lawful use of vacant or built-up land that is physically possible, appropriately supported, while financially feasible and able to produce the highest value of the land.

III. RESEARCH METHOD

3.1. Research Location

The research location of this data collection was held in four road sections (Pahlawan St., H.Cokroaminoto St., Gatot Subroto St., and Soekarno Hatta St.) in Probolinggo City where the road equipment assets were found from audit report of Indonesian Audit Board (*Badan Pengawas Keuangan/BPK)*.

3.2. Population and Sample of the Research

Population of this study is the decision makers that also understand and involved in the asset management activities in Probolinggo City, where in this study was handled by Probolinggo City Transportation Agency and Regional Revenue, Finance, and Asset Management Agency, with total population of 62 individuals. Moreover, the sample of this study obtained in random method by purposive random sampling method.

From the calculation result, the selected number of samples was 40 respondents where these respondents were taken from those who knew and were involved in determining the priority policies for development activities carried out at the Probolinggo City Transportation Agency and Regional Revenue, Finance and Asset Management Agency as a representative, while determination of each sample size was taken based on research needs. The respondents also asked to fill out a list of questions on the questionnaire made by the researchers. In addition, direct interviews were also conducted to clarify certain questions or answers.

3.3. Type of Data and Data Collection

3.3.1. Primary Data

A list of questions in a form of questionnaire was created to obtain primary data based on the required and relevant analysis parameters that in line with the aims and objectives of this study. The questionnaire was given to respondents which had been selected in prior time. The respondents were employees of regional apparatus of Transportation Agency and the Regional Asset Financial Management Agency of Probolinggo City Government.

3.3.2. Secondary Data

The secondary data obtained from result of literature studies in formats of government regulation books, monographs, articles or journals related to road equipment assets.

3.3.3. Data Collection

Data collection was conducted through a questionnaire with 40 respondents as sample study, the individuals who are knowledgeable and involved in managing assets of Probolinggo City as represented by the Probolinggo City Transportation Agency and the Regional Revenue, Finance and Asset Management Agency. A Likert scale was employed for scoring criteria for the answers of the questions in the questionnaire which ranging in points as state below [11]:

1 = Strongly disagree
2 = Disagree
3 = Neutral (no opinion)
4 = Agree
5 = Strongly agree

3.3.4. Tabulation Data

The obtained data from the questionnaire then processed in tabular form for gathering information regarding the study object. The processed data later be used to answer question statements in the problem formulation. The tabulation data should consider the type of collected data and then giving an orientation toward the desired objectives. Accuracy level of the analysis technique has significant impact to the accuracy of research results. In this study, the selected data analysis technique was a linear regression test with the aid of SPSS program.

IV. RESULT AND DISCUSSION

4.1. Road Equipment Management in Traffic Order Zone of Probolinggo City

Asset management of road equipment in Traffic Order Zone (*Kawasan Tertib Lalu Lintas or KTL)* of Probolinggo City currently heading into many fundamental issues related to asset recording, maintenance, optimization and supervision which not carried out in a systematic way. According to the result of research that covering five main dimensions of asset mnanagement (inventory, legal audit, assessment, optimization and application development), the overall average score of 3.44 reflected the asset management was in moderate category with many substantive weaknesses in technical implementation aspects.

The asset inventory dimension is the basic or initial foundation in the asset management cycle and has an average score of 3.35 with main findings of most road equipments such as traffic signs, warning lights, and road markings were not administratively recorded. Direct observation on four main roads (H.Cokroaminoto St., Gatot Subroto St., Soekarno Hatta St., and Pahlawan St.) showed 60 units of a total of 235 traffic signs were not recorded and 37 units were in non-functional condition. It indicates a weak inventory system that should be functioned as entry point for comprehensive asset management is failing to serve its duty. Siregar emphasized that inventory process must include continuous identification, classification, and recording of assets to make the asset information can be used as a basis for decision-making. Irregularity of recording also in line with findings of Basuki that reported the inaccuracy in reporting and classifying assets delays the effective asset management process within government environment. [8,12]

Meanwhile the legal audit and asset valuation dimensions that should strengthen legitimacy and economic value of the assets have not shown optimal performance. Legal audit dimension has an average score of 3.54 and asset valuation dimension has an average score of 3.40 indicate most respondents believe the audit and valuation processes have not been conducted in routine and thoroughly ways. Many road equipments in Traffic Order Zone of Probolinggo City have no clear ownership status, or have not undergone transfer (handing over the ownership status) process as required by regulations. Apart from it, asset valuation has not been conducted in regular schedule although it acts as the basis for decision making regarding disposal, renovation or new procurement plans. These findings are align with a study of Kurniawati and Santoso which reported without regular valuation, the regional assets cannot be utilized optimally and leading to budget inefficiencies. [10,16]

The asset optimization dimension which relates to effective utilization and use of assets also showing a moderate score (3.41). At several strategic points of Traffic Order Zone such as intersections or sharp bends, road equipments like corner mirror and warning light were minimally installed, or in some worse cases, these devices were available but not functioning/damage. It indicates the existing assets were not managed according to the level of urgency and traffic risk, contradictive to the principle of effective asset management principle where emphasizes on asset utilization based on functional needs rather than only performed as annual administrative routines. [14]

The dimension of application development was assessing the use of information technology in asset management and has an average score of 3.53. Although SIAKAD (*Sistem Informasi Aset dan Keuangan Daerah)* or Regional Asset and Financial Information System application is available, the use of SIAKAD has not been optimal and not fully integrated into the road equipment management process. It indicates technology use still unable to address fundamental problems related to speed, punctuality and data accuracy. In line with Home Affairs Ministerial Regulation (*Permendagri)* No.19 of 2016, there is one asset management information system called SIMA as one of the prerequisite for creating accountable and transparent asset management and can be used for management assets of road equipments in dense traffic areas such as in Traffic Order Zone. [15]

The asset security and supervision become the most crucial dimension that received highest average score of 3.93, indicating these aspects are the major weakness in road equipment management in the Traffic Order Zone. Majority respondents stated the road assets were not given security markings like codes or labels, not reported in the admistrative way, and not monitored either through physically (in the field) or administratively (in the data system). This finding indicates no adequate internal control mechanisms to ensure sustainable function and condition of assets in the field. However, according to Siregar, security and supervision are the final stages of the asset management cycle which must be carried out in a systematical way to prevent any loss, misuse or undetected damage. [1]

Overall, the research discussion confirming that road equipment asset management in Traffic Order Zone of Probolinggo City must be dealt with structural and technical challenges as evident in weaknesses in recording, legality, assessment, optimization, and supervision that will bring negative impact not only in asset value losses but also the increased safety risks for road users. Therefore, reformation in asset management is needed through digital-based data collection, technical SOPs development, human resource capacity building and development of integrated SIMA (Traffic Management Information System). Through these measured steps, Probolinggo City will able to build a more orderly and efficient road equipment management system that supports sustainable traffic safety.

4.2. Influential Problems to Road Equipment Management in Traffic Order Zone of Probolinggo City

Asset management of road equipment in Traffic Order Zone (*Kawasan Tertib Lalu Lintas or KTL)* of Probolinggo City currently heading

Based on documentation result and field observation on four main roads (H.Cokroaminoto St., Gatot Subroto St., Soekarno Hatta St., and Pahlawan St.) in Probolinggo City, there are several significant problems found in the management of road equipment assets. The recorded data showed number of traffic signs are dominant type of road equipment from all available equipments with total number of 235 units, but there are 37

units in non-functioning condition (damaged) and other 60 units that are not administratively recorded. This condition indicates a weak recording and maintenance system, where it should be the core part of asset management process. [1]

Other equipments such as cornering mirror was found only one unit in operational located on Pahlawan Street, while the other busy roads were absent. Cornering mirror has crucial role for road location with limited visibility. Also, only one unit of warning light which serves as an early warning system for accident found inoperable condition (non-functional). It indicates that availability of these type of assets is not conforming the standard quality and effectiveness checking, and open a possibility to potential hazard for the road users, in particular at night time or during bad weather.

From a total of 615 identified equipment units, 60 units were unregistered and 42 units were non-functional. Soekarno-Hatta Street was the road section that owned highest number of units (238 units) but also recorded high number of unregistered (30 units) and non-functional (14 units) road equipments. It indicates the asset management has not been implemented consistently across all road sections, also, there is no prioritation based on actual traffic needs in current condition.

This problem is exacerbated by many internal and eksternal factors. From internal standpoint, many government apparatus do not yet understand the professional asset management practices and have not received technical training about the use of asset information system. While external factors are include limited maintenance and procurement budget from Probolinggo City Regional Budget (APBD) and resulted in abandonment of damaged assets without routine maintenance. The absence of Asset Management Information System (SIMA) resulted in the recording activity which must be conducted in manual way that prone to human error and out of sync with the field conditions. [15,16]

These findings align with definition of asset management by Britton, Connellan and Croft in Siregar which states that asset management must be carried out in a systematic process, starting with inventory, legal audit, assessment, maintenance and monitoring and disposal. Whereas the absence of asset management SOPs and weak cross-sectoral coordinations indicate the asset management in Probolinggo City does not yet fulfills these principles. As a result, decisions about new procurement or distribution of road equipment tend to be annual routine activity without consideration of the actual needs in the fields. [1]

This research also conforming a study by Basuki that found the unsystematic asset recording will lead to less optimal management of official vehicle assets in the public sector. Similar findings also identified by Avianty et al., which highlighting asset data input errors due to unreliable classification during data entry in SIMA application. Furthermore, the research by Rotty et al. stated the lack on inter-unit coordination and weak human resource capacity led to low accuracy result in asset reporting. [12,14,19]

In support, a study by Kurniawati and Santoso affirmed that maintenance and security play a very important role in optimizing the fixed assets, while inventory has no significant impact unless accompanied by real actions on the field. This situation is evident in Probolinggo City, where traffic signage were partially recorded but without actual repair efforts made to these damaged signs. A research by Bunga also suggests that supervision and control are important mediating variables for achieving optimal asset management, a factor that clearly not exercised in optimal way at the study site. [13,17,18]

The findings from audit report of the Supreme Audit Agency (BPK RI) over the past three years (2021-2023) together with intervention of Indonesian Attorney General's Office in 2024 are affirming that asset issues are not only administrative matter in nature, but it has legal implications and potential regional losses. This condition has a serious impact on traffic safety and effectiveness of public services in the transportation sector. By considering the strategic position of Probolinggo City on Java-Bali Pantura road route, a safe and orderly transportation system is a mandatory. Thus, a comprehensive asset management reform is necessary with priorities on the following aspects: (1) re-registering all assets through digital approach and a centralized database, (2) comprehensive implementation of SIMA system, (3) preparation of technical SOPs for asset management for Transportation Agency, (4) upgrading the human resource capacity through regular trainings and (5) improving the cross-sectoral coordination system to make the procurement and distribution of road equipment is conducted based on the actual needs.

The problem with road equipment asset management in Probolinggo City reflect weaknesses throughout the asset management cycle; from inventory to supervision. Without structural and technological changes in management, road equipment asset will continue to deteriorate, goes unrecorded, and becomes a source of potential losses. By implementing asset information system, improving human resource capacity, and strengthening internal coordination, the Probolinggo City government can create an effective, efficient and accountable asset management system in relation to the good governance principles.

4.3. The Influence of Assets Management to Security and Supervision of Assets

The result of simple linear regression analysis indicate the asset management has a positive and significant effect to the security and supervision of road equipment assets in Traffic Order Zone (*Kawasan Tertib*

Lalu Lintas/KTL) of Probolinggo City. According to coefficient table output, the regression coefficient value is 0.614 with a significant value of 0.000 ($p < 0.05$) and a calculated t value of 5.736. It indicates that asset management variable statistically has a significant effect on the security and supervision variables. The positive coefficient indicates that every increase in asset management by one unit will increase the effectiveness of asset security and supervision by 0.614 unit under the assumption of other variables remain constant. While the standardized beta value of 0.681 shows the influence size is included in the strong category.

These findings are affirming fact that weaknesses in asset security and supervision in the field are closely related to the weak implementation of a systemic asset management cycle. As identified in the previous descriptive data where security and supervision received the highest average score of 3.93 (the higher the score, the lower the workperformance) indicating that most respondents believe the road equipment assets are not coded/marked, not administratively reported and not monitored through either data or physical activity. These finding are supported by field observation showing many traffic signs, warning lights and road markings are damaged, unregistered, and even have unknown status.

Based on public asset management theory proposed by Siregar (2004), the security and supervision process are the final stage in the asset management cycle which can only be carried out effectively when the previous stages (such as inventory, legal audit, and assessment) executed properly. In this context, the regression data showed a strong relationship between the asset management and the security-supervision variables as an affirmation of weak performance from asset security variable is not a stand-alone factor, but rather a consequence of the weakness of the asset management as a whole.

The absence of an integrated asset information system (SIMA) along with no SOPs for supervision and weak administrative are reported to be the main causes of weak asset control.

Previous research by Rotty et al. and Avianty et al. also emphasized that asset supervision will be difficult to conduct if the asset inventory and legality sistems are not well established. In line with this finding, a study by Kurniawati and Santoso further added that security would only be successful when accompanied by an accurate assessment process with the help of information technology within the asset management. Therefore, integration between dimensions in asset management is an absolute requirement to ensure the success of security and supervision function, in particular for the context of dispersed and high-risk public assets such as road equipments. [13,14,17,19]

In brief, these results indicate an improvement to the security and supervision of road equipment in the Traffic Order Zone of Probolinggo City is possible where the primary focus should be on strengthening comprehensive asset management system. The local government need to improve inventory accuracy, clarify the legal status of an asset, conduct regular assessments, and optimize asset utilization based on analysis of the actual needs. Furthermore, by assembling and implementing asset information system that able to monitor the status, location and condition of road equipment in real time, it will support supervision function effectiveness.

Therefore, strengthening asset management into a structured, measurable and technology-based manner clearly will bring direct impact on improving the quality of security and supervision of road equipment assets. These findings provide a strong basis for city government to design a reliable asset management policy that is not only administrative but also functional and preventative in nature to ensure the sustainable function of road assets in public spaces.

V. CONCLUTION

From the discussion and result of this study, the researchers are able to withdraw conclusion as stated in the following explanation:

1. The management for road equipment asset in Traffic Order Zone in Probolinggo City is not working in optimal way since there are main problems of weak inventory system, unclear asset legality, lackness of routine assessments, low utilization optimization, and minimal security and supervision existing in the field. Although digitalization efforts have been made through SIAKAD application, its implementation is not yet comprehensive and effective. This condition indicates a need for comprehensive improvements through technology-based data collection, improvement of human resource capacity, development of technical SOPs, and strengthening the monitoring system to make the road equipment asset management can work in more accountable and efficient way as well as able to support the sustainable traffic safety.
2. Problems affecting management of road equipment assets in Traffic Order Zone of Probolinggo City include weak data collection, minimal maintenance budget, lack of human resource capacity, no integrated asset information system and low coordination between sectors, all of which resulted in many road equipment asset being unrecorded, damaged or unable to be utilized in optimum way.
3. Based on analysis result, the researchers conclude that asset management has a positive and significant impact to the security and supervision function of road equipment assets in Traffic Order Zone of Probolinggo City. The better the implementation of asset management (including inventory, legal audit, assessment, optimization, application and utilization) the more effective the security and supervision functions to road equipment assets.

It indicates that weaknesses in asset supervision are direct impact of existing asset management system which not yet performed in optimal level, therefore, an overall and integrative improvement to asset management system is required to ensure the safety and efficiency of public services in transportation sector is well performed.

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