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OPTIMIZING THE HANDLING OF NATIONAL ROAD PRESERVATION IN BANGKA BELITUNG PROVINCE USING THE INTEGRATED ROAD MANAGEMENT SYSTEM (IRMS) E-BUDGETING PROGRAM

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Abstract: **In order to meet the service level of the national road network following with the current needs and future needs by optimizing the smallest costs and risks, the Directorate General of Bina Marga in the Ministry of Public Works and Public Housing uses a decision support tool, namely IRMS-V3 in the overall business process of programming and budgeting of road network preservation. This study aimed to determine the handling of Road Preservation in Bangka Belitung Province, assisted by the Integrated Road Management System (IRMS) e-budgeting Program. From the running result, it will be seen that the road preservation management program was in accordance with the provided funding limit and the road stability target. Data from field surveys, unit prices of work, and the accuracy of validated fieldwork history information were needed to ensure consistency of programming outputs by the IRMS-V3 program. The IRMS-V3 e-budgeting program was used to optimize the strategic planning process for road network preservation, programming, and budgeting for the preservation of the national road network, as well as being one of the supporting tools for decision-making at Bangka Belitung National Road Implementation Center to support the achievement of the national road stability target for Bina Marga Strategic Plan, Ministry of Public Works and Public Housing. In order to calculate road handling following the indicative ceiling, the IRMS program used. Researchers need to conducted calculations to keep the road stability in good condition to avoid decline. The running results showed that the handling was more appropriate. If you want to achieve 100% stability, then a road preservation ceiling fund of 955,996,704,278 was established to achieved maximum stability.**

Keywords-- **Road network, SMD, IRMS e-budgeting, Bina Marga Strategic Plan Stability.**

I. INTRODUCTION

The road network in Bangka Belitung Province currently consists of National Roads, Provincial Roads, and Regency/City Roads. Based on National Road Decree No. 248/ KPTS/ M/2015, the National Road consists of 40 sections along 600.40 KM. Every year maintenance is always carried out to maintain the value of its stability so people can travel comfortably and safely.

Due to limited funds, every Fiscal Year, the Ministry of Public Works and Public Housing through the Directorate General of Bina Marga always provides an Indicative Ceiling for each province, adjustments were determined from the decision of the Directorate General of Bina Marga. Following the target guideline of Bina Marga's strategic plan, the budget is adjusted to the road's condition following the budget that has been determined.

The maintenance of the Bangka Belitung road segment is the authority and responsibility of the Bangka Belitung National Road Implementation Center. Each road condition always has its handling including Routine, Condition Routine, Minor Rehab, Major Rehab, and Reconstruction. With an annual road maintenance program, expected that the road conditions in Bangka Belitung province will remain in stable condition so that the society enjoys roads safely and comfortably.

Amendment to the Law of the Republic of Indonesia Number 38 of 2004 concerning Roads changed to Law of the Republic of Indonesia Number 02 of 2022 concerning Roads in Article 1 paragraph 07, namely, Road Development is the activity of preparing programs and budgets, technical planning, land acquisition, construction implementation, road operations, and/or or Road preservation.

Bangka Belitung National Road Implementation Center, the technical implementation unit of Bina Marga in the Ministry of Public Works and Public Housing, has a range of duties and functions, one of which is road handling activities, which involve prevention, maintenance, and repairs needed to

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maintain road conditions so that they serve traffic optimally so that they can last longer and accomplish the set plan.

Research Objectives

The following are the purpose of this research:

1. To obtain the type of road preservation handling to maintain stability and follow the Bangka Belitung National Road Implementation Center Strategic Plan.
2. To find out the required budget if 100% road stability is desired in the province of Bangka Belitung.

II. LITERATURE REVIEW

Road Classification

Classification according to road status: Based on PP no. 34 of 2006 Articles 25 to 30, the road network classified according to its status is divided into 5 (five) types, namely as follows:

1. National Road
2. Provincial Road
3. District Road
4. City Street
5. Village Road

IRI

International Roughness Index is a parameter used to determine the level of the unevenness of the road surface. The Roughness parameter is presented on a scale that describes the unevenness of the pavement surface felt by the driver. The unevenness of the pavement surface is a function of the longitudinal and transverse sections of the road surface. Besides these factors, Roughness is also influenced by vehicle operational parameters, namely wheel suspension, vehicle shape, vehicle level position, and speed.

PCI

Pavement Condition Index (PCI) is an estimate of road conditions with a rating system to state the actual pavement condition with reliable and objective data. The PCI method was developed in America by the U.S Army Corp of Engineers for airport pavements, highways, and parking areas because with this method accurate data and condition estimates are obtained according to conditions in the field. PCI levels are written in levels 0 - 100.

IRMS

Integrated Road Management System is an integrated software system that is used to assist in making road policies collecting data and planning national and provincial road maintenance programs. In addition to being a program planning tool, IRMS is also designed to be a road condition monitoring tool that can be used both at the central and regional levels.

Steady Way

According to the Minister of Public Works Regulation No. 13 of 2011, Steady Roads are sections of roads with good or moderate conditions according to the planned age which are calculated and follow a certain standard.

The Strategic Plan

The connectivity infrastructure program has strategic objectives, program targets, and activity targets that are derivatives. The program target of the Directorate General of Bina Marga is to improve the performance of national road services, which is revealed in the activity target of the Directorate of Road and Bridge Preservation Region I, namely Improving the Regulation and Guidance of Road and Bridge Preservation. The target of this activity has 2 (two) parameters with the following this explanation:

a. Road condition rating: the weighted average value of several individual components that are commonly used in assessing the condition of a road segment, namely the indicators of IRI (roughness), PCI (pavement surface condition), remaining age of use (pavement strength), and effectiveness of drainage (surface drainage and subsoil drainage);
b. Percentage of bridges in good condition: handling by taking into account the condition value (NK) of the bridge to achieve the target of bridge stability.

III RESEARCH METHODS

Research Flowchart

Overall, the preparation of this research activity can be seen in Figure 1. The research flow chart is as follows:

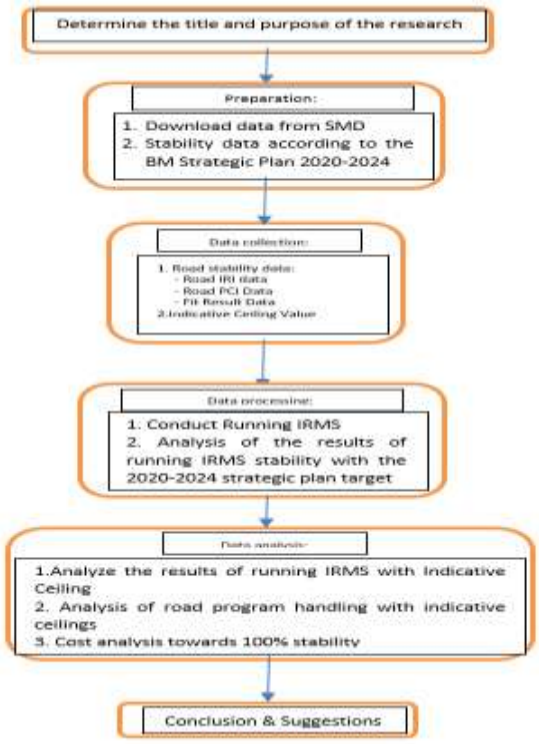

Fig 1. Research Flowchart

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Required Data Type:
1. IRI & PCI Road data from SMD
2. Data on the Stability of the Strategic Plan of Highways
3. Fit Survey Results Data
4. Indicative Ceiling

IV. RESULTS AND DISCUSSION

Result
From the running result, it was found that routine maintenance treatment was 588.40 km and for Effectiveness, there was 10.37 km of Minor Rehab, 0.70 km of Major Rehab, and 0.80 km of Reconstruction, from the available indicative ceiling from the results of the handling, obtained stability results of 98, 50%.

Data Presentation
The strip map data contained in the SMD was in the form of road condition data from the survey results, then exercised from the sharpening results. The overall collection of data was entered into the IRMS for road network reporting and road handling, then juxtaposed with the stability data in the 2020-2024 Bina Marga Strategic Plan.

Method of Collecting Road Data Before Running.
To optimize road handling in Bangka Belitung Province before made a determination, it is necessary to conduct a road condition survey first to obtain IRI and PCI values from each STA on each road segment. Based on the implementation in the field, the survey method with guidance from IRMS requires a longer survey time in the field where the input process for road coordinate data was input.

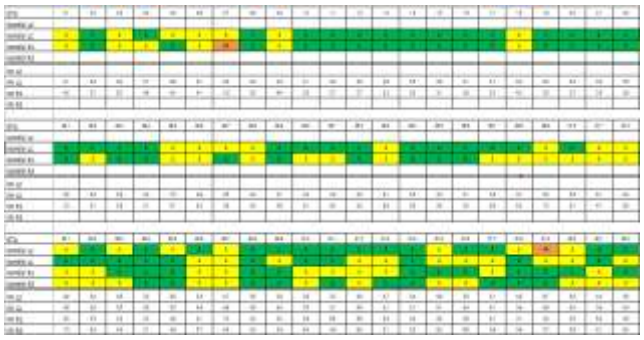

Fig 2. Street Map Data Strip

The IRI value listed on the Strip Map also has a color on each STA to make it easier to see the IRI Condition Value. After the data from the field was obtained, it will be inputted by the surveyor to the SMD to facilitate access to storage data.
Road validation is also necessary to ensure that the IRI value obtained by the Surveyor Team matches the field conditions. IRI supporting data is also in the form of Visual Data in the form of PCI (Pavement Condition Index).

Road Stability According to the Strategic Plan Target of Bangka Belitung
Based on the results of field survey data obtained in 2021 semester 2, the results of the recap of road stability in Bangka Belitung were obtained. The data used as a basic material in the road preservation budget preparation. Presented in the following table:

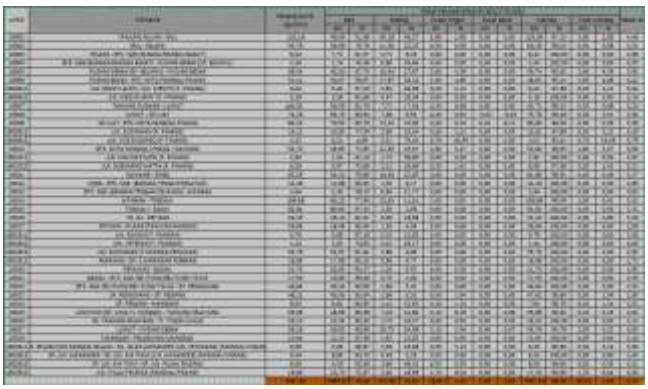

Table 1. Road Stability Data in 2021

Semester 2
Stability results were obtained in 2021 semester 2 of 98.50% was in steady condition, and 1.50% was in unsteady condition. With 600.40 km long, the segment consists of 440.96 km on Bangka Island and 159.53 km on Belitung Island out of a total of 40 roads.
The stability value that has been obtained, then adjusted to the 2020-2024 strategic plan. Conducted to see whether the road stability program every year always meets the target or not. The following is the data for the 2020-2024 Strategic Plan Target in Bangka Belitung.

No.	Sasaran	Indikator Kinerja	Satuan	Target 2020	Target 2021	Target 2022	Target 2023	Target 2024
1	SP. Meningkatnya KINERJA PELAYANAN jalan nasional	IKP1 TINGKAT AKSESIBILITAS jalan nasional (%Pek,PEW,PGW,simpul transportasi nasional,dan kawasan strategis nasional (KSPN, KEK, KI Prioritas, ITP/DPTK) yang telah diakses jalan nasional)	%	84,20	85,15	86,32	87,38	88,44
		IKP3 RATING KONDISI jalan nasional (rata-rata rating nilai IRI, PCI, umur struktur jalan, dan drainase jalan pada seluruh ruas jalan nasional)	-	2,70	2,43	2,43	2,43	2,43
		IKP4 TINGKAT KESELAMATAN jalan nasional (indeks keselamatan jalan)	-	4,40	4,40	4,40	3,90	3,90

Table 2. Performance Targets Organizer Program Targets

Delivering the output targets of the main activities of the Directorate General of Bina Marga for the 2020-2024 strategic plan period following the estimated development needs and capacity (delivery capacity) of work units within the Bina Marga environment.
After the results of the comparison between the 2021 stability data in semester 2 and the data of the 2020-2024 Strategic Plan Target Bangka Belitung, in 2021 the stability obtained has exceeded the strategic plan target threshold. To maintain stability so that it remains in good condition, it is necessary to

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handle each segment periodically to achieve maximum stability.

Establishing Maximum Stability Conditions with Available Funds Budget to Achieve 100% Stability

Every year there is always a road management program that always adjusts the data from the field survey but also needs to adjust the available budget. Based on the data from the 2021 survey in semester 2, it can determine the handling in 2022 so that the initial stability value of 98.50% can increase due to the handling.

The handling that has been conducted may not necessarily be 100%, because not all roads can be handled optimally due to the limited budget funds that have been provided by the center.

Table. 3 Ceiling Unconstrained 100% Stability

If you want to achieve 100% unconstraint stability with 600.40 Km the length of the segment consists of 440.96 Km on Bangka Island and 159.53 Km on Belitung Island from a total of 40 roads. So, it requires a road preservation ceiling fund of 955,996,704,278 to make 100% stability.

V. CONCLUSION

1. The data on the results of the stability obtained in the second semester of 2021 was 98.50%. When compared with the 2020-2024 Bina Marga strategic plan target for Bangka Belitung, concluded that Bangka Belitung Province can exceed the target of the 2020-2024 Bangka Belitung Strategic Plan.
2. In the process of achieving the 100% stability target, a road preservation ceiling of 955,996,704,278 was needed to carry out maximum handling so it can optimize the condition of national roads in Bangka Belitung Province.

VI. SUGGESTION

The accuracy or the survey data will determine the output results of running IRMS, so that treatment program obtained of high quality and follows the field conditions.

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