Strategy to Mitigate the Impact of Budget Refocusing on Road Infrastructure

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ABSTRACT: *Refocusing and reallocation of the budget in Malang regency occurred for two years, this affected the budget of the Malang regency Public Works Department of highways and road handling in 2020 and 2021. This study uses qualitative methods with inductive and descriptive approaches. This method is used to examine the condition of natural objects with triangulation techniques, namely Observation, interview and documentation, which overall emphasize meaning rather than generalization. Based on the results of analysis using the Provincial / KabupatenRoad Management System (P/KRMS) method obtained a steady road percentage of 72.55%. The amount of budget to deal with road damage to achieve the target of Key Performance Indicators (IKU) in 2023 is 73%, a budget is needed IDR 325.42 billion by handling routine maintenance of 1,210.80 km of Roads, Rehabilitation of 62.91 km of roads and reconstruction of 44.52 km of roads.*

KEYWORDS – Budget Refocusing, Road Infrastructure, Strategy

I. INTRODUCTION

Corona Virus Disease 2019 or commonly abbreviated as COVID-19 was first identified in Indonesia on March 2, 2020. The government of Indonesia has made various efforts to deal with infectious diseases caused by the SARS-CoV-2 virus, one of which is through Presidential Instruction (INPRES) number 4 of 2020 concerning Refocusing activities, budget reallocation, and procurement of goods and services in order to accelerate the handling of Corona Virus Disease 2019 (Covid-19) [3]. Refocusing and reallocation of the budget in Malang regency occurred for two years, this affected the budget of the Malang regency Public Works Department of highways and road handling in year 2020 and year 2021.

In a previous study conducted by Dachi (2021)entitled analysis of direct budget Refocusing Regional work units (SKPD) at the regional financial, revenue and Asset Management Agency (BPKPAD) in South Nias regency, North Sumatra province, pointing out that the direct budget refocusing on education gives influence both physically and non-physically and has an impact on the condition of the working environment, employee performance, budget ceiling and acceleration of the implementation of regional [1]. In the research conducted by Sutrisno (2022)indicates that the Bandar Lampung City Government is carrying out a budget Refocusing policy according to Presidential Instruction Number 4 of 2020.A number of funding posts were diverted for the covid-19 handling program and the results were quite effective [2].

Based on several previous research studies, an analysis of the impact of budget refocusing on road maintenance work needs to be done to

determine the impact caused by the decline in the condition and performance of steady roads in Malang regency. Due to budget constraints, road damage that should be handled periodically only handled temporary hole cover, which is maintenance in the form of hole cover only betahan in a short money.

II. LITERATURE REVIEW

2.1 Road

Road is a land transportation infrastructure that includes all parts of the road, including connecting buildings, auxiliary buildings and equipment intended for traffic, which are at ground level, above ground level, below ground level, and/or water, and above water level, except rail, lorry, and Road cable roads [4].

According to its designation, the road consists of public roads and special roads. Public roads are grouped by system, function, status, and class. While the special road is not intended for public traffic, but for the benefit of traffic itself/certain organized by other than the organizer of the road [4].

2.2 Road Preservation

Preservation is a preventive maintenance to maintain the stability of the road until it reaches the age of the plan. Road preservation should be carried out continuously or carried out continuously based on the condition of the road segment concerned without depending on the routine budget cycle. Continuity of maintenance is supported by the availability of budget support in accordance with the needs in the field. Based on Law Number 2 of 2022 concerning the Second Amendment to Law Number 38 of 2004 concerning roads, road preservation includes activities :

1. Routine maintenance is the activity of caring for and repairing damages that occur on roads with steady service conditions.
2. Periodic maintenance is the activity of handling any damage that is taken into account in the design so that the deterioration in road conditions can be restored to a stable condition in accordance with the plan.
3. Rehabilitation is the activity of handling any damage that is not taken into account in the design that results in decreased stability conditions in certain parts/places of a road with a slightly damaged condition so that the decrease in stability conditions can be restored to a stable condition in accordance with the plan.
4. Reconstruction is a handling activity to be able to improve the ability of the Ja-lan section in unstable or critical conditions so that the road section has a steady service condition in accordance with the established age plan.
5. Widening towards the standard is the handling done to achieve the standard dimensions of the width of the road.

2.3 Provincial/Kabupaten Roads Management System (P/KRMS) Method

P / KRMS is a Windows-based application system that uses Microsoft Access which serves as the main data base source to generate road condition projection analysis reports, handling Needs Analysis (Annual and periodic), roadmap/streetmap, and statistical analysis accompanied by QGIS (Quantum Geographic Information System) Application Support in presenting network maps Road [5]. The P / KRMS system has three core components:

1. Has a method of updating data regularly based on established procedures and is also equipped with the use of modern devices.
2. Using electronic devices for road databases that have geo-spatial capabilities and can store, process and report road assets and programs.
3. Has the process of planning analysis, programming and budgeting of road maintenance, especially road works that have the purpose of preserving the road network, namely routine and periodic maintenance, and can provide information for the preparation of work and the design process.

The system is built using MS-Access version 7 and runs on Windows XP or later, and uses QGIS software. This system is supported by MS-Access database by using input data table and output data table from analysis process. The system uses a location reference system for provincial and county roads. The main components are presented on Fig. 1, with a focus on producing programming output and budgeting work. As for the display interface of the program P / KRMS shown in Fig. 2, where there are panels for data entry as described in Table 1.

Table 1. Explanation of P/KRMS menu options list

Menu options	Function	Scope
administrative scope functions	group all functions for storing	• provincial administrative information • Hall • Regency • Island District Hall
Network Settings	group all functions for storing and managing road network Road	• Segment Data (road segment list, DRP, road segment location on District, Road Class) • Corridor • data Multi-Criteria Analysis (MCA)
Menu options	**Function**	**Scope**
Road	Group all functions for storing Road Section data Road	• inventory road • condition (asphalt, non asphalt) • road section data Inspection
Structure	Group structure all functions for storing	• culvert structure data (inventory and condition) • retaining wall (inventory and condition) • Bridge (Inventory and condition)
Traffic	Group all functions for storing traffic data traffic	• Volume traffic • weighting factor
Unit Price	Group all functions for storing dataunit	• price unit price main work (periodic maintenance, rehabilitation, support) • unit price routine maintenance (roads, bridges, culverts, retaining walls)
analysis and	programming programming analysis calculates the need based on inventory data and road conditions and traffic volume (unlimited budget analysis) for RM (routine maintenance) and MW (main work). Then a limited budget analysis is performed on a specific annual budget by using the MCA criteria	and then the user can: • manually review the work program. • Creating a package for MW / RM selected for next year's work program

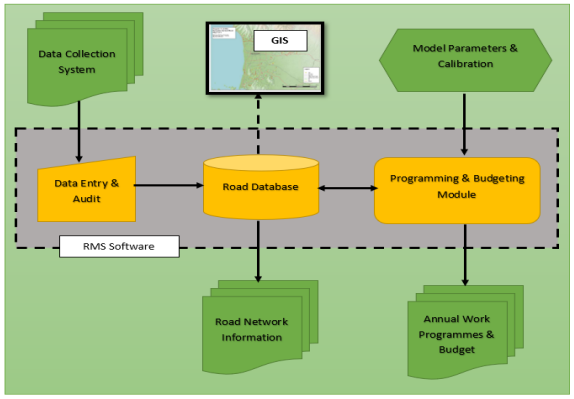

Fig. 1 P/KRMS structure chart

Fig. 2P/KRMS Program Interface

For the main or major work, the condition data is converted into the value of the Treatment Trigger Index (TTI) which is a combination of road damage using the equation below:

$$TTI_0 = \Sigma\left(Roughness\ x\ IRI_f\ x\ wf_i\right) + (Distress_i\ x\ wf_i)/(Section\ Lenght\ x\ Width$$

Where,

Roughness: the measurement value of unevenness inIRI

IRI_f: IRI value becomes TTI conversion factor

wf_i : damage weight value

TTI weight factor can be seen in Table 2. As for the value of the TTI range used for intervention conditions shown in Table 3. Typical TTI values used for intervention types of treatment are shown in Table 4

Table 2. TTI weight factor

Distress	Distress with Roughness	Distress without Roughness
Roughness	1	0
Bledding	0.5	0.5
Ravelling	0.5	0.5
Disintegration	1	4
Crack with Depression	1	4
Pacthing	1	1
Other Crack	1.75	2
Pothole	0.5	1.5
Rutting	0.5	1
Edge Damage	1	1

Table 3. Typical TTI values used for Condition and maintenance interventions

Condition Description	TTI Range
Good	0 - 20
Fair	20 – 70
Poor	70 – 100
Bad	>100

Table 4. Typical TTI values used for handling type interventions

TTI value TTI	range
< 50	no major work / routine
maintenance 50-100	Periodic
Maintenance> 100	rehabilitation

By using TTI progression with and without maintenance, the benefits of maintenance strategy can be determined. The process includes the calculation of the value of the Treatment Priority Index (TPI), where each maintenance work using the sum of the value of the multiplication of the weight value and the value of the MCA parameters. TPI is calculated as follows:

$TPI_i = W_1 \, x \, S_1 + W_2 \, x \, S_2 + \ldots \ldots W_5 \, x \, S_5$

Where,

W_i: weight value for parameter I of MCA

S_i: Nilai MCA dari parameter i

The total value of wi is 100. The priority of periodic maintenance and reconstruction is carried out on a limited budget, where the Treatment Priority Index (TPI) is set, with the rank of the year until the budget runs out. The first Parameter MCA is a mandatory parameter, although the user can specify the weight of this parameter, calculated based on a combination of traffic levels, road conditions and prices. This combination is used as a substitute in economic analysis and is calculated as follows :

$S_1 = WTI \, x \, TTI / \, TreatCOST$

Where,

S_1 : Nilai MCA dari parameter 1

WTI : Nilai Weightted Traffic Index (WTI)

TTI : Nilai Treatment Trigger Index (TTI)

TreatCOST: Maintenance Price Value

For the value of WTI obtained from:

WTI = AADT(v) x WTI_factor (v)

Where,

WTI : Nilai Weightted Traffic Index (WTI)

AADT(v) : AADT untukkendaraantipe v

WTI_factor(v) : WTI weight factor for Vehicle Type v as shown in Table 5.

Table 5. Vehicle Weight Factor

Vehicle Type	WTI Factor
Motorcycle	0.2
Passenger cars	1
Pickup	1
Small truck	1.2
Small Bus	1.5
Big Bus	2
Small Truck	1.5
Medium Truck	2
Big Truck	3
Truck Trailer	3
Semi Trailer	3

III. RESEARCH METHODOLOGY

The research method starts from the preliminary study and determining the location of the study and determine the road sections to be carried out Impact Analysis refocusing anggran as well as the preparation of strategies used to improve the condition of road stability. This research method uses qualitative inductive and descriptive approaches. This method isa method used to examine the condition of natural objects with triangulation techniques, namely Observation, interview and documentation, which overall emphasizes meaning rather than generalization [1]. The informants in this

interview activity amounted to 8 people consisting of the head of Public Works Highways Malang, head of road maintenance, head of development and Road Improvement, head of Engineering Development, PPK and PPTK.

IV. RESULTS AND DISCUSSION

This study was conducted in the administrative area of Malang regency. The location of the study was carried out on the roads of the District. For the location of the road used as research can be seen in Fig.1.

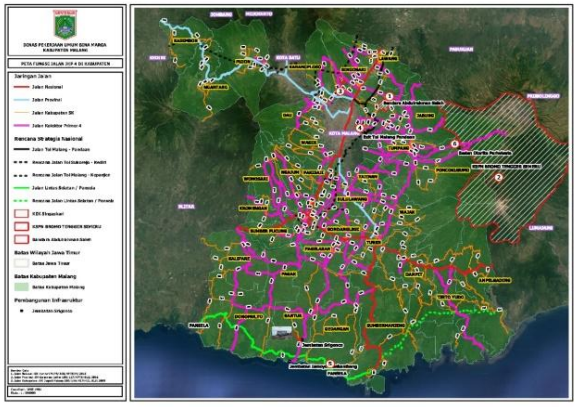

Fig. 1 Research Location

The recapitulation data of all roads in the district under study can be seen in Table 6.

Table 6 Recapitulation Of District Roads

Number	District area	Length of the Regency Road (km)	number of roads
UPT Singosari			
1	Lawang	62,850	39
2	Singosari	102,230	26
3	Karangploso	25,600	8
4	Dau	36,550	10
UPT Tumpang			
5	Pakis	73,310	17
6	Jabung	22,975	8
7	Tumpang	75,570	27
8	Poncokusumo	28,500	4
UPT Bululawang			
9	Wajak	20,250	5
10	Tajinan	36.000	4
11	Bululawang	56,330	22
12	Gondanglegi	48,970	16
13	performances	27,410	12
UPT Turen			
14	Turen	72,805	23
Number	**District area**	**Length of the Regency Road (km)**	**number of roads**
15	Dampit	99,590	22
16	Tirtoyudo	76,700	6
17	Ampelgading	45,790	9
18	SumbermanjingWetan	76,100	9
UPT Pagak			
19	Gedangan	52,540	6
20	bantur	72.055	8
21	Pagak	42.900	7
22	Donomulyo	54.400	7
23	Caliph	60,620	8
UPT Kepanjen			
24	Sumberpucung	25,660	6
25	Kromengan	24,330	4
26	Wonosari	49,070	8
27	Ngajum	30,000	5
28	Kepanjen	73,697	51
29	Pakisaji	48,050	9
30	Wagir	63,350	9
UPT Pujon			

31	Pujon	29,960	11
32	Ngantang	28,870	8
33	kasembon	25,730	7
total		**1,668,762**	**421**

4.1 Strategies In Improving The Performance Of Road Stability

In order to improve the performance of the stability of district roads, analysis and strategies that can be implemented are needed. Based on the data of the results of running P/KRMS will produce a priority order of handling as a recommendation of the planning program. The results of P/KRMS program Analysis for district roads are shown in Table 8.

Table 8 Results of P/KRMS Analysis

Regency	condition-TTI (*Paved*)			
	good (km)	Fair (km)	Poor (km)	Bad (km)
Malang regency	993.48	217.32	227.26	230.80
Total	993.48	217.32	227.26	230.80
percentage	59.53%	13.02%	13.62%	13.83%

Based on Table 8 of P/KRMS analysis results obtained good condition 59.53%, fair condition 13.02%, poor condition 13.62% and bad condition 13.83%. Steady road conditions are the sum of good and medium conditions of 72.55%. As for improving the condition of road stability, various efforts or road infrastructure handling schemes are needed as shown in Table 9.

Table 9 Road infrastructure handling scheme in Malang regency

Description	**length (km)**	**needs handling**	**budget needs (IDR in Million)**	**the minimum requirement to maintain road performance (IKU 72.55% to 73%) (IDR in Million)**	**Output (Km)**
good	993.48	Routine maintenance	62,833	-	-
Fair	217.32	routine maintenance/routine maintenance condition	40,204	103,038	1,210.80
Poor	227.26	Periodic Maintenance	409,068	113,247	62.91
Bad	161.56	reconstruction/upgrade (hotmix)	355,432	68,879	31.31
	69.24	reconstruction/improvement (concrete)	207,720	40,254	13.42
Total	**1,668.76**		**1,075,258**	**325,417**	**1,318.44**

V. CONCLUSION

Based on the analysis of the impact of budget refocusing on the performance of road stability, several conclusions were obtained as follows:

1. Based on the results of the analysis of the condition of the road stability with the P/KRMS method obtained good condition 59.53%, fair condition 13.02%, poor condition 13.62% and bad condition 13.83%. The percentage of steady road of 72.55%.
2. Strategies undertaken in improving road conditions steady is to see the priority of road handling based on the results of analysis P/KRMS and the results of interviews with experts in the field of road infrastructure. Based on the results of the analysis of the condition of road stability in 2022 (72.55%), the amount of budget to deal with road damage in order to achieve the main performance indicator (IKU) target of 73%, an Budget of approximately IDR 325.42 billion. Efforts that can be done is to handle routine maintenance of roads along 1,210.80 km and handling in the form of road rehabilitation along 62.91 km and reconstruction with hot mix pavement along 31.31 km and reconstruction with cement concrete hardness along 13.42 km.

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