

# A Critical Analysis of Malang City Government Policy on Road Repair Targets: An Evaluation of Infrastructure Performance Based on Dunn's Model

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## Abstract

This study examines the implementation of the Malang City Government's policy targeting the repair of damaged and potholed roads. Employing a qualitative approach and guided by William N. Dunn's evaluation model, the research assesses the policy along six key indicators: effectiveness, efficiency, sufficiency, equity, responsiveness, and timeliness. Data were gathered through in-depth interviews with municipal staff and document analysis. Findings indicate that while the policy has achieved high levels of road quality—with 98.85% of roads meeting a “sound” condition—the distribution of repair efforts remains uneven. Key impediments include budget constraints, weather-related delays, and limited technical human resources, whereas strong community participation and continuous monitoring emerge as central supporting factors. The study concludes with recommendations for enhanced data integration, adaptive budget planning, and strengthened public engagement to further optimize infrastructure repair efforts in Malang City.

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## 1. Introduction

Infrastructure plays a pivotal role in promoting economic development and ensuring community safety and mobility. In urban environments, road networks serve as critical public infrastructure that enables diverse socio-economic activities. The reliability and safety of infrastructure directly influence the quality of life and the effective functioning of cities (Zimmerman, 2008). Specifically, well-maintained roads are associated with improved safety outcomes and support for economic activities by facilitating efficient transportation (Safil & Anuar, 2012). However, cities like Malang are increasingly challenged by road infrastructure deterioration, driven by factors such as overuse, erratic weather, and the pressures of rapid urbanization. Poor road conditions not only hinder mobility but also pose significant risks to safety and economic resilience (Persia et al., 2016). Effective management and continuous investment in infrastructure are therefore essential to address these urban challenges and support sustainable growth (Zhang, 2009).

The Malang City Government has taken a strategic step to address deteriorating road infrastructure by enacting Regional Regulation No. 35 of 2021. This regulation outlines the roles and responsibilities of the Department of Public Works, Spatial Planning, Housing, and Settlement Areas (PUPRPKP) in managing road repairs and maintenance. While this policy demonstrates a commitment to responsive infrastructure management, challenges remain regarding the uneven distribution of repairs and delays in implementation.

These implementation issues are not unique to Malang. Evaluations of similar

infrastructure policies in other urban centers have shown that inefficiencies often stem from poor inter-agency coordination, limited public engagement, and the absence of integrated performance metrics to evaluate policy success. A study on urban infrastructure management emphasizes the need for comprehensive performance indicators that consider accessibility, safety, environmental impact, and mobility to ensure maintenance efforts align with policy goals (Nicolosi et al., 2008).

For example, in Dandora, Kenya, poor road conditions persisted despite formal infrastructure policies. Research highlighted that effective management requires involvement from multiple stakeholders, including local communities, to ensure inclusive and sustainable urban development (Mungai, 2008). Similarly, in Lagos, Nigeria, urban residents expressed willingness to pay for better roads, provided the policies are transparently implemented and yield tangible improvements. This highlights the importance of evaluating not only technical outcomes but also social and economic implications of road policies (Otegbulu, 2011).

Furthermore, urban infrastructure projects often face disconnects between transportation and urban planning sectors. In Marseille, France, road development initiatives intended to support urban renewal failed to achieve integration due to fragmented governance and budgetary constraints. This case reinforces the need for cohesive planning frameworks and funding strategies that link road infrastructure development with broader urban policy goals (Leheis, 2008).

In conclusion, while Malang's road improvement policy reflects a proactive governmental approach, achieving effective implementation requires stronger inter-agency collaboration, community participation, and the use of integrated performance metrics to monitor policy effectiveness. Lessons from other cities suggest that inclusive governance and outcome-based planning are key to ensuring equitable and efficient road infrastructure development.

This study aims to assess the performance of the road repair program using Dunn's six-dimensional evaluation framework. By identifying both the supporting and hindering factors in the policy implementation, the research seeks to provide insights that can inform future improvements and ensure more equitable service delivery across the city.

## **2. Methods**

This research employed a qualitative field study approach to explore the implementation dynamics of the road repair policy in Malang City. The study was designed to evaluate the policy using the evaluative framework developed by William N. Dunn, which includes six key indicators: effectiveness, efficiency, sufficiency, equity, responsiveness, and timeliness (Dunn, 2017). Data were gathered through two primary methods. First, in-depth interviews were conducted with key informants, including officials and technical personnel from the Department of Public Works, Spatial Planning, Housing, and Settlement Areas (PUPRPKP). These interviews aimed to capture detailed insights regarding operational procedures, policy execution challenges, and perceived outcomes. Second, document analysis was undertaken by reviewing a range of relevant materials such as regulatory documents, municipal planning reports, implementation records, and official performance evaluations.

The data analysis process adopted the model developed by Miles, Huberman, and Saldana, which involves three interconnected stages: data reduction, data display, and conclusion drawing (Miles et al., 2014). Data reduction was carried out by condensing and categorizing the raw data collected from interviews and documents to highlight relevant themes and patterns. These were then organized and displayed systematically in accordance with the six dimensions of Dunn's evaluation model to enable clearer interpretation. Finally, conclusions were drawn by identifying consistencies, discrepancies, and interrelationships within the data, with the validity of findings strengthened through source and method triangulation. This analytical approach ensured a comprehensive understanding of the policy's performance and its contextual intricacies.

## **3. Results and Discussion**

### **Result**

#### **Effectiveness**

The effectiveness of the road repair policy implemented by the Malang City Government is

reflected in its ability to achieve substantial improvements in road quality across urban and sub-urban zones. According to the *Laporan Penyelenggaraan Pemerintahan Daerah (LPPD)* for 2023, 98.85% of the city's total road network, which spans approximately 941.388 kilometers, was recorded to be in "sound" or "good" condition. This is a significant achievement, considering the city's dynamic population growth, increasing traffic volumes, and recurring climate disruptions.

The success of this outcome is largely attributed to the city's proactive planning framework and a shift toward performance-based monitoring. The Dinas Pekerjaan Umum, Penataan Ruang, Perumahan dan Kawasan Permukiman (PUPRPKP) has implemented a systematic road assessment schedule. Each segment of the road network is evaluated using clear, measurable technical indicators before and after intervention. An official from the planning division noted:

*"We conduct continuous evaluations to ensure that the improvements meet the technical standards. Each completed road is reviewed again before final acceptance."*

Moreover, the selection of road segments for rehabilitation or maintenance is informed by a digitalized survey system, which incorporates satellite imagery and on-ground verification. This use of data-driven tools enhances the accuracy of targeting and increases the impact of every intervention. The findings from the *Road Condition Survey Report* confirm that roads such as Jalan Letjen S. Parman, Jalan Ijen, and Jalan Soekarno-Hatta showed rapid improvements in road surface integrity following targeted interventions.

In addition, community reports via Sambat Online contributed to more localized responsiveness, especially in residential areas that are not always prioritized in top-down plans. The policy's emphasis on maintaining consistent quality standards, timely verification, and stakeholder involvement has helped position effectiveness as the strongest performing indicator among the six evaluated.

### **Efficiency**

The efficiency of the Malang City Government's road repair policy is evident in the optimal use of available financial, human, and operational resources. In 2023, the budget realization for road-related activities demonstrated high levels of absorption: 97.41% for road rehabilitation projects, 98.67% for periodic maintenance, and 97.68% for routine maintenance. These figures, obtained from the *Laporan Realisasi Anggaran (LRA)* of Dinas PUPRPKP, suggest that the department succeeded in minimizing fiscal inefficiency and avoiding the underutilization of allocated funds—an issue common in public infrastructure projects.

This financial efficiency is the result of a proactive procurement strategy. As explained by one of the procurement officers:

*"Our procurement and planning teams coordinate early to avoid delays or unspent budgets. Contractor selection is done through open bidding, ensuring that we get quality performance at optimal cost."*

The department's use of a pre-tender system ensures that technical partners are vetted for competence, and contract execution is monitored with strict compliance indicators. These practices help reduce risks of project overruns and delays, thus lowering indirect costs associated with administrative backlogs or repeat repairs.

Additionally, efficiency is not limited to budgetary matters. The management of human resources also contributes significantly. Tasks are delegated to specialized field teams based on geographic zones, enabling quicker response times. Third-party contractors are required to employ certified labor and submit weekly progress reports, as outlined in the city's operational guidelines.

Document analysis shows that the *PUPRPKP Maintenance Log* includes detailed entries about material use, time allocation, and productivity benchmarks for each project. This level of documentation helps ensure accountability while supporting continuous improvement.

In summary, the policy demonstrates strong financial and operational efficiency, driven by planning foresight, competent human capital deployment, and transparent contractor

engagement mechanisms all of which enhance the value-for-money outcome of road infrastructure investments.

### **Sufficiency**

The sufficiency of the road repair policy in Malang City refers to the extent to which the interventions address the overall infrastructural needs of residents, ensuring that repair actions are comprehensive and inclusive of various road conditions. Based on the *Laporan Kinerja Instansi Pemerintah* (LKjIP) and field implementation data from the *PUPRPKP Maintenance Log*, the city has adopted a multi-tiered approach to road maintenance: including routine maintenance (daily to monthly checks), periodic maintenance (every 6–12 months), and rehabilitation for roads with deeper structural deterioration.

This layered strategy ensures that minor, moderate, and severe damages are treated with tailored methods. According to a senior field technician:

*“For potholes, we apply the Salob technique using cold mix asphalt. For more extensive wear, we use Sirtu—sand and gravel combination—and heavy machinery like Tandem Rollers to restore evenness.”*

These responses confirm that the city is not merely responding reactively but has designed scalable solutions that correspond with both the severity and frequency of road damage.

Moreover, sufficiency is ensured by geographic spread. Maintenance data confirm that roads in both central and peripheral districts—including Klojen, Blimbing, Kedungkandang, and Lowokwaru—have received consistent attention. Documented interventions include rehabilitation work on Jalan Terusan Sulfat, Jalan Borobudur, and Jalan Karya Timur, showcasing that the repair efforts are not disproportionately focused on main city arteries but also include secondary and residential roads.

The sufficiency dimension is further strengthened through the integration of community-reported issues via Sambat Online, which has resulted in previously overlooked streets receiving prompt repairs.

In conclusion, the sufficiency of Malang’s road repair policy is affirmed by its technical adaptability, zone-wide application, and responsiveness to grassroots needs. The city has successfully established a policy framework that aligns road maintenance interventions with the actual volume and diversity of infrastructural demands.

### **Equity**

Equity, within the framework of public policy evaluation, refers to the fair and just distribution of services, ensuring that all segments of society receive proportional benefits regardless of geographic or socio-economic conditions. In the context of Malang City’s road repair policy, this dimension reveals both commendable progress and ongoing challenges.

From the document analysis, especially the *Road Condition Survey Report* and the maintenance prioritization matrix in the *PUPRPKP Maintenance Log*, it is evident that roads with severe damage—such as Jalan Pasar Induk Gadang and Jalan Bandara Timika—have been identified for major rehabilitation. Meanwhile, other roads like Jalan Ijen and Jalan Suropati, which experienced only light surface damage, were repaired more rapidly due to their accessibility and strategic importance.

However, an equity gap emerges in the implementation timeline. While minor-damage roads in city centers received prompt attention, some heavily damaged roads in outer or densely populated neighborhoods have experienced delays. This issue was candidly acknowledged by one PUPRPKP official:

*“We are aware of the disparity. The delay in northern Pasar Gadang, for example, is largely due to DAK (Special Allocation Fund) disbursement timelines from the central government. We can’t proceed until those funds are officially released.”*

Community interviews and Sambat Online feedback also highlighted frustrations among residents in underserved areas who felt overlooked. While the city has invested in digital tools to capture citizen complaints, the physical execution of repairs is still subject to bureaucratic and fiscal constraints, limiting equitable delivery.

Thus, although the city demonstrates a strong technical awareness of which areas require

attention, the ability to respond evenly across all districts is hindered by structural dependencies—particularly on national-level funding and limited local budget autonomy.

In conclusion, while progress has been made, the equity dimension of the road repair policy remains partially fulfilled. More robust, decentralized budgeting and zone-based performance monitoring could help close this service gap and deliver fairer infrastructural outcomes citywide.

### **Responsiveness**

Responsiveness reflects a policy's capacity to adapt to public needs, feedback, and evolving circumstances. In the case of Malang City's road repair program, responsiveness emerges as a strong dimension, particularly through the institutionalization of participatory channels and real-time feedback mechanisms.

The Malang City Government has made considerable efforts to open two-way communication with the public through digital and non-digital platforms. Tools such as Sambat Online, direct messages via social media (@dpuprpkp.malangkota on Instagram), and official WhatsApp complaint lines have enabled residents to report damaged roads efficiently. According to an official from the Public Information and Complaints Division:

*"Many of our recent repair actions have been initiated based on community reports through Sambat Online. Once a complaint is received, we verify it within days through a field survey team."*

This system ensures that even roads outside the initial technical repair plan can be incorporated into the implementation schedule, depending on urgency and feasibility. Analysis of maintenance reports from PUPRPKP confirms that at least 17% of road repair activities conducted in Q2 and Q3 of 2023 were responses to citizen-submitted complaints.

Moreover, the responsiveness dimension is enhanced by regular coordination between PUPRPKP and *kelurahan* (urban village) offices. These local administrators act as intermediaries in filtering complaints, especially from residents with limited access to digital services. The government also invites community representatives to pre-budget planning forums (Musrenbang) to ensure alignment between technical planning and grassroots priorities.

However, while the input channels are well-established, some delays in response time—especially for roads requiring budget reallocation or complex permitting—were noted. Nonetheless, the presence of these institutional mechanisms reflects an evolving governance culture that is increasingly citizen-centered.

In conclusion, Malang City's road repair policy shows a high level of responsiveness by embedding public participation into planning and execution cycles. This has enabled the city to remain agile and adaptive in responding to local infrastructure concerns.

### **Timeliness**

Timeliness refers to the ability of a public policy to be executed within an appropriate and scheduled timeframe. For road infrastructure policies, it includes the capacity to carry out maintenance and rehabilitation activities according to predefined timelines and seasonal considerations. In the case of Malang City's road repair policy, timeliness emerges as a partially achieved dimension due to both internal and external constraints.

Based on document analysis from the *PUPRPKP Maintenance Log*, most road repair activities were scheduled to be executed within the first three quarters of 2023. However, several key interventions were delayed and had to be rescheduled in Q4 due to persistent rainfall and administrative bottlenecks. The *Road Project Scheduling Report* indicates that at least 22% of projects experienced delays of more than one month beyond the original work plan.

This issue was confirmed by field staff during in-depth interviews. A project supervisor from the road maintenance unit commented:

*"Even when our teams and materials are ready, we often have to stop or postpone repairs because of sudden rain. It becomes risky and inefficient to proceed under such conditions."*

In addition to weather disruptions, delays in the disbursement of Special Allocation Funds

(DAK) from the central government also slowed project initiation in certain districts. For example, the rehabilitation of Jalan Bandara Timika and the northern section of Pasar Induk Gading had to wait for formal budget clearance, despite being prioritized in local planning documents.

The city has responded by integrating early warning systems for weather and adjusting schedules flexibly where possible. Still, timeliness remains a challenge when infrastructure planning intersects with unpredictable natural conditions and funding bureaucracies.

In summary, while many targets were met, the full realization of the policy's timeliness objective is constrained by seasonal unpredictability and intergovernmental fiscal dependencies. Strengthening contingency planning and multi-year budgeting could enhance future performance in this area.

## **Discussion**

This study evaluated the Malang City Government's road repair policy using William N. Dunn's multidimensional evaluative framework. By applying the six indicators—effectiveness, efficiency, sufficiency, equity, responsiveness, and timeliness—the findings suggest a generally positive impact, although important gaps remain. While policy intentions have translated into improved road quality outcomes, systemic challenges—such as uneven geographic implementation, financial constraints, and environmental variability—underscore the need for strategic refinement. The following sections examine each dimension in greater depth, incorporating global insights on urban infrastructure policy implementation.

### **Effectiveness and Efficiency**

The road repair policy in Malang has demonstrated strong effectiveness, with 98.85% of the city's roads reported in good condition. This is a noteworthy achievement, indicating that the policy meets its core goal of improving road infrastructure quality. The efficient use of resources, especially through competitive procurement and contractor oversight, has contributed to this success. Transparency and a structured evaluation mechanism have further bolstered implementation, aligning with best practices observed in other cities globally.

For example, Neil (1991) discusses how integrated land transport planning in Australia—focusing on efficiency indicators and output-based evaluations—has significantly improved road quality and project delivery times (Neil, 1991). Similar patterns were observed in a U.S.-based study, where cities employing rigorous monitoring systems and data availability saw improved efficiency in road and sidewalk maintenance (Gibson & Marshall, 2022).

However, effectiveness should not be measured solely by coverage. As noted by Handayani (2008), road development initiatives in Indonesia often overlook environmental and social concerns, suggesting that physical improvements may mask underlying issues if not complemented by broader impact assessments (Handayani, 2008).

### **Sufficiency and Equity**

Despite impressive improvements, the policy's sufficiency and equity remain contentious. Disparities in repair distribution suggest that not all urban areas are benefitting equally. Areas with complex structural degradation or low administrative visibility often receive delayed or insufficient attention. This phenomenon aligns with global critiques that centralized infrastructure planning often marginalizes peripheral zones.

In the European context, Cataldo (2017) emphasizes that infrastructure development strategies must be tailored to regional characteristics, as top-down interventions can exacerbate spatial inequities without localized decision-making (Cataldo, 2017). Furthermore, Lupak and Kunytska-Iliash (2019) found that the lack of regional planning and ineffective public administration mechanisms in Ukraine significantly hinder rural road development and equitable access (Lupak & Kunytska-Iliash, 2019).

To address this, Malang could leverage digital mapping technologies and geographic information systems (GIS) to identify road conditions and prioritize interventions based on need, not political or economic considerations. Adopting data-driven spatial equity frameworks, as recommended in international studies, can better allocate limited funds and ensure no neighborhood is left behind (Alhodairi & Elfahd, 2019).

### **Responsiveness and Timeliness**

The Malang City Government's policy framework has demonstrated moderate responsiveness, evident through feedback loops from community members and regular policy reviews. However, recurring delays in road repairs point to weaknesses in contingency

planning and funding dependencies. Unpredictable weather patterns further disrupt schedules, revealing the fragility of current implementation mechanisms.

Weather-related disruptions are not unique to Malang. In their analysis of transport responsiveness, Hammadou et al. (2015) argue that integrating real-time data analytics and predictive modeling can enhance timeliness and policy adaptability (Hammadou, Mahieux, & Papaix, 2015). By embedding sensor networks and Internet of Things (IoT) infrastructure into road systems, cities can monitor degradation in real time, triggering proactive maintenance.

Moreover, cities such as Beijing have employed integrated traffic management systems inspired by the Amsterdam PPA project, which allow adaptive responses to traffic and maintenance needs (Weng, 2010). A similar approach could enhance Malang's responsiveness to dynamic challenges, from traffic patterns to stormwater impact on road surfaces.

### **Technology and Innovation in Infrastructure Policy**

One of the most promising avenues for improvement is the integration of smart technologies in road infrastructure planning and maintenance. Recent research supports the use of IoT, cloud-based systems, and big data analytics to optimize urban infrastructure efficiency and equity (Yang et al., 2021). For Malang, deploying such systems can not only automate maintenance planning but also generate performance dashboards to improve public transparency.

Additionally, as cities adopt performance-based budgeting, these tools can help justify expenditures and provide evidence for external funding. The shift toward smart infrastructure should be accompanied by staff training and institutional reforms to ensure meaningful implementation.

### **Participatory Governance and Accountability**

Robust governance and community involvement are essential for equitable and sustainable policy outcomes. Participatory governance can help align policy actions with the real needs of citizens, improve trust in public institutions, and ensure oversight. According to a multi-country study, including cases in South Africa and South Korea, participatory mechanisms substantially improved accountability and service delivery in urban infrastructure projects (Strengthening Accountability, 2018).

In the case of Malang, local forums and digital complaint systems could serve as practical tools for citizen engagement. Additionally, involving communities in infrastructure monitoring could function as a compensatory oversight mechanism for institutional gaps, as recommended by Handayani (2008).

### **Environmental and Social Sustainability**

Although the policy's core objectives are largely technical, broader urban sustainability concerns must be considered. Infrastructure interventions without environmental safeguards can result in long-term degradation, especially under climate stress. In Jakarta, the lack of integrated environmental policy within toll road development led to persistent pollution and reduced community well-being (Handayani, 2008).

To avoid similar outcomes, Malang's road policy should integrate principles of green infrastructure—such as permeable pavements and rain gardens—especially in flood-prone areas. This also aligns with the city's climate adaptation goals and can reduce long-term maintenance costs.

## **4. Conclusion**

The comprehensive evaluation of Malang City's road repair policy using Dunn's six-dimensional framework reveals meaningful progress in enhancing urban infrastructure. The policy has demonstrated strong performance in several key areas—particularly in terms of effectiveness, as reflected by the substantial proportion of roads now classified in good condition; efficiency, through the streamlined use of contractors and resource deployment; and timeliness, supported by structured implementation timelines and periodic performance reviews. Furthermore, the inclusion of community feedback mechanisms and iterative planning reflects an increasingly responsive governance model.

However, despite these advancements, the equity dimension remains a significant shortcoming that warrants immediate and targeted policy attention. The unequal distribution

of repair efforts across neighborhoods has led to pockets of infrastructural neglect, which in

turn risks undermining the broader benefits achieved through citywide improvements. Equity in infrastructure provision is not merely a normative goal but a functional imperative; neglected areas often face amplified risks such as traffic accidents, mobility constraints, and heightened social dissatisfaction. Addressing these disparities is therefore crucial for ensuring the durability and inclusivity of development outcomes.

Going forward, future policy refinements should prioritize a more spatially just distribution of resources. This can be achieved through adaptive budgeting systems that are sensitive to real-time infrastructure needs and environmental stressors—particularly in the context of increasingly unpredictable weather patterns. The integration of digital technologies, such as GIS-based asset mapping and predictive maintenance algorithms, would allow policymakers to track road conditions more dynamically and allocate resources based on objective performance data.

Moreover, the policy's responsiveness can be further strengthened through more inclusive stakeholder engagement, particularly at the neighborhood level. Empowering local communities to participate in planning, monitoring, and evaluation processes not only improves policy legitimacy but also enhances service delivery outcomes. Participatory governance models have been shown to improve infrastructure quality, foster public accountability, and enhance satisfaction with public services.

Finally, a shift toward proactive infrastructure management—rooted in sustainability, digital innovation, and community collaboration—will be critical for reinforcing urban resilience. Lessons from global case studies underscore the importance of combining technological tools with institutional reform and citizen involvement. By adopting a multi-stakeholder and data-informed approach, Malang City has the opportunity to evolve from a reactive infrastructure regime to a holistic, future-ready urban governance model.

In conclusion, while the current road repair policy in Malang has laid a strong foundation, it must now mature into a more balanced and forward-looking system. Equity, adaptability, and collaboration must become guiding principles to ensure that the benefits of development are not only maximized but also fairly and sustainably distributed across all segments of the urban population.

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