Analysis of Policy Implementation and Integrated Bus Rapid Transit (BRT) Transportation in Medan City

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Abstract

This study aims to describe the Analysis of Policy Implementation and Integrated Bus Rapid Transit (BRT) Transportation in Medan City. The qualitative research method, often referred to as a method that examines natural conditions, was utilized in this study. This research method serves as a scientific procedure to collect data with specific objectives. Data analysis is the process of systematically searching for and organizing data. The data collection techniques employed in this study include observation, interviews, and documentation studies. The data collected were then analyzed in three stages: data reduction, data display, and verification. The research results reveal that the Medan City Government is currently implementing significant urban mobility projects, focusing on two main activities: the development of the Bus Rapid Transit (BRT) system and the revitalization of the Kesawan area and Merdeka Square. Both activities emphasize the importance of pedestrian and cyclist infrastructure development while also facilitating public access to transportation in Medan. These efforts are part of the Medan City Government's commitment to fostering sustainable urban mobility and ensuring that all areas of Medan are accessible through quality public transportation.

Keywords: Policy Implementation, Integrated Bus Rapid Transit (BRT) Transportation, Medan City

Introduction

Currently, infrastructure development and mobility policies still follow a conventional approach that prioritizes private motorized vehicles. This prioritization fosters a societal dependence on

personal vehicles, potentially leading to issues like pollution and a decline in urban quality of life. Additionally, public transportation services are not yet fully optimized, further exacerbating this reliance on private motor vehicles. Such dependence can also create social issues, such as inequality for those who cannot access personal motorized vehicles. The unreliability of public transportation is evident in networks that do not yet reach many areas, limited fleet availability, and infrequent service.

As one of Indonesia's largest cities, Medan has high levels of mobility. Nevertheless, similar to many other cities in Indonesia, transportation modes in Medan are still dominated by private vehicles. According to data from the Central Statistics Agency (BPS) in 2020, the total ownership of motor vehicles in Medan reached 288,378 units, with 95% comprising cars and motorcycles, creating an imbalance in mode share on road space. To reduce dependence on private motor vehicles, Medan is now one of the cities receiving support from the Ministry of Transportation and the World Bank for establishing a Bus Rapid Transit (BRT) system. This collaboration is seen as a positive first step toward more sustainable mobility in Medan.

The implementation of BRT infrastructure cannot be separated from other mobility systems, such as pedestrian and cyclist facilities. For the BRT to operate optimally, especially in terms of passenger capacity, there must be facilities to bridge the initial and final segments of trips to access the BRT, known as the first and last mile. Improving pedestrian and cycling infrastructure is expected to expand BRT access to more areas, making it easier and more convenient for all community members. Besides enhancing pedestrian and cyclist facilities, the BRT system should also consider road space design, traffic management systems, and urban mobility policies, all of which will be discussed in this document.

In addition to the BRT plan, the Medan City Government and the Ministry of Public Works and Housing (PUPR) are planning and constructing the Medan City Center area at the time of this report. This includes the development of Merdeka Square, improvements to pedestrian facilities, construction of cycling facilities in the Medan Old Town area, an underpass on Gaharu Street, and an overpass at the Medan Train Station. Aside from the underpass project, all these activities and development plans intersect with the planned BRT corridor and route, scheduled to begin construction by the end of 2023. To achieve convenient and reliable mobility in Medan, all plans must be well-coordinated and integrated. It is crucial that sustainable transportation systems, such

as BRT, pedestrian, and cyclist facilities, become top priorities. To fulfill these priorities and monitor development progress, infrastructure planning will need to be adjusted to ensure ideal implementation.

This operational model allows the BRT to serve both corridor and off-corridor routes, enabling a broader population to be served compared to previous systems.

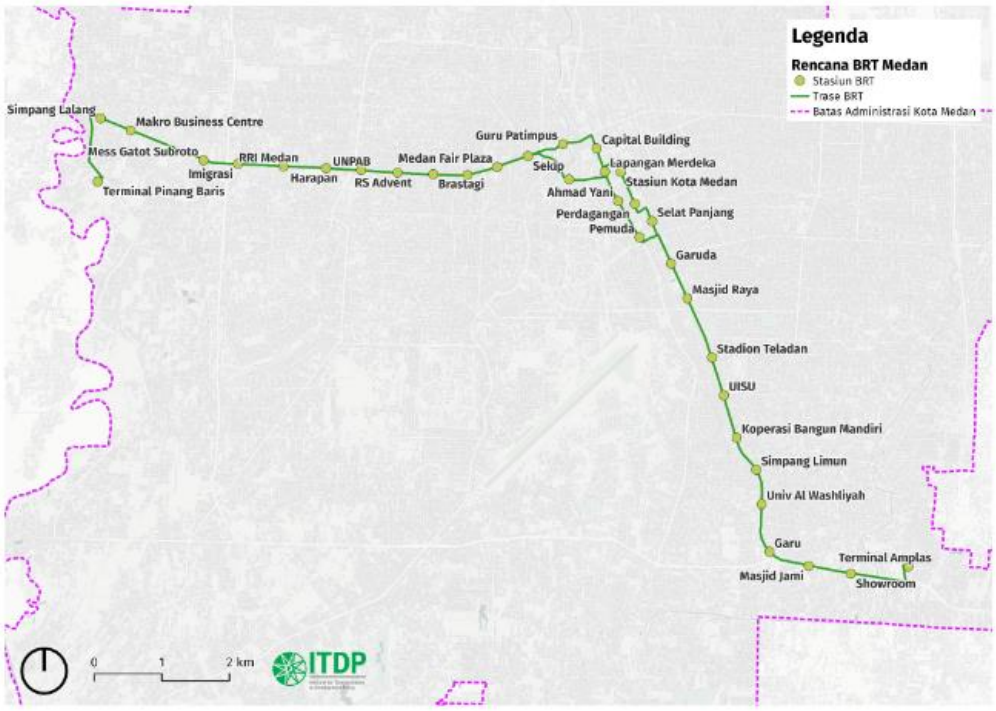

Figure 1. Planned Development of Dedicated BRT Lane and BRT Stations in Medan

The dedicated BRT lane in Medan is planned to run along the city's main west-to-east axis on the Gatot Subroto - Sisingamangaraja corridor, connecting the Pinang Baris Terminal in the city's west, crossing central areas near Merdeka Square and Kesawan, and extending southeast to the Amplas Terminal. This BRT lane will span 21 kilometers at grade level, serving 33 designated BRT stations, two of which will be located within the terminals mentioned.

The Medan City Government is providing Bus Rapid Transit (BRT) services as a public transportation mode for Medan City. This initiative aims to support the provision of urban public transport, aligned with public demand for an efficient, safe, comfortable, reliable, and affordable option. The operation of the BRT system is expected to increase public interest in using public transport, thereby helping reduce the use of private vehicles as an effort to alleviate traffic congestion, disorder, and traffic accidents [1]. The BRT system will be supported by predetermined

routes, designed to meet the goal of catering to public passenger transport needs with enhanced service quality and adequate physical facilities.

Supporting facilities such as stops are essential for BRT operations on these designated routes. A stop is a public passenger vehicle halt equipped with a structure for picking up or dropping off passengers [2]. BRT stops differ from general bus stops, functioning as smaller-scale terminals exclusive to BRT passengers, as BRT does not operate large terminals and only picks up or drops off passengers at designated stops. The construction of public facilities, particularly stops, requires land, yet the challenge lies in limited land availability [3]. The selection of stop locations plays a crucial role in enhancing surrounding land value. The most influential factors affecting land and building values in property are location factors, including proximity to bustling centers, elevated areas, and coastal proximity, while less influential factors include topography, such as uneven land contours, size, and type.[4]

The socio-cultural dynamics of urban transportation, both generally and specifically in Medan, have shown a critical condition. This is evident from the rising use of private vehicles each year and the lack of orderly behavior in transportation, a reflection of socio-cultural realities. The government's strategy of providing mass rapid transit (BRT) aims to reduce traffic congestion and disorder among urban road users. The BRT initiative, embodied in the Mebidang bus system, serves as a form of social engineering to narrow the growing vertical gap in access to transportation services.

The prevalent use of private transportation reflects an inclusion phenomenon in transportation, which has socio-cultural implications that do not support equitable transportation access, potentially widening social exclusion within society. The Mebidang bus, representing a city transport system, is an effort to reform inhumane transportation practices. Introducing new values in transportation, such as discipline and proper behavior in using the Mebidang bus, creates a much-needed new order for the urban population. Values of comfort, safety, respect for time, and cost embedded in the Mebidang bus service are expected to reduce various transportation-related risks. Consequently, the Mebidang bus aims to improve the quality of life for the people in Medan.

Theoretical Framework

Bus Rapid Transit (BRT)

Bus Rapid Transit (BRT) is a flexible, rubber-tired mode of transport that combines high-speed transit with stations, vehicles, services, roads, and Intelligent Transportation System (ITS) elements in an integrated system with a strong identity [5] BRT is a high-quality, client-oriented transit system that offers speed, comfort, and affordability [6]. It is a fast mode of transportation that combines the high quality of rail transport with the flexibility of bus services [7].

BRT, or busway, is a high-quality bus-based transit system designed for urban mobility that provides fast, frequent, and affordable services. It includes pedestrian pathways, dedicated infrastructure, rapid operations, unique marketing, and customer service advantages. Essentially, BRT emulates the performance characteristics of modern rail systems. A BRT system generally costs between 4-20 times less than Light Rail Transit (LRT) and 10-100 times less than a subway system.

Urban Transportation

Urban transportation is a modeling stage that estimates the number of movements originating from a zone or land use, or the number of movements attracted to a land use or zone. It represents the amount of traffic generated by a specific area or land use within a given time period. Urban transportation refers to the number of trips occurring within a time unit in a specific land use zone [8]. The urban transportation system can be understood as a holistic unit consisting of interdependent components that cooperate to provide transportation within urban areas. The overall transportation system (macro) can be broken down into smaller (micro) systems that are interconnected and mutually influential.

Research Methodology

The qualitative research method is also known as a method of research conducted in natural conditions, sometimes referred to as the ethnographic method, as it was initially used more extensively in cultural anthropology research [9]. In conducting this research, the researcher acts as a human instrument, using in-depth interviews as a data collection technique, requiring the researcher to interact with the data sources [10]. Therefore, the researcher must be well-acquainted with the individuals providing the data [11].

Research methodology is a scientific procedure or approach to obtain data with a specific purpose. [11] states that research methodology is essentially a scientific feature used to obtain data for certain purposes and applications [12]. In the context of urban transportation infrastructure planning, this research uses the synthesis method, which entails creating a comprehensive summary from various references on definitions or opinions [13]. This summary is compiled into a new, cohesive piece of writing that aligns with the researcher's needs. The presentation is based on multiple reference sources that the researcher used to compile a scientific work. The result of synthesis can be in the form of data, facts, information, or new core ideas [14].

"Data analysis is the process of systematically searching for and organizing data obtained from synthesizing, forming patterns, selecting important data to study, and then drawing conclusions that are easily understood by both oneself and others."[15] The data collection techniques used in this research include observation, interviews, and documentation studies [16] The obtained data is then analyzed in three stages: data reduction, data presentation, and verification [17]

Results and Discussion

Standards and Objectives of Urban Transportation Policy for Bus Rapid Transit (BRT) in Medan City

Every policy has specific standards and objectives that serve as the foundation for evaluating its implementation performance. In other words, the success of policy implementation can be assessed based on the standards and objectives of the policy. In this context, the content of the policy is crucial to understand the direction of the Bus Rapid Transit (BRT) development policy in Medan City. This implies that the implementation of the urban transportation policy based on "Bus Rapid Transit (BRT) in Medan City" must have fundamental standards and objectives that influence the City of Medan's policy implementation.

The implementation of the Bus Rapid Transit (BRT) urban transportation policy in Medan is the responsibility of the Medan City Government, as mandated in North Sumatra Province Regulation No. 5 of 2014 on Road, Rail, River, and Lake Transport, as well as Crossings within North Sumatra Province. This regulation obliges the North Sumatra Government to ensure the availability of mass public transportation to meet public transportation needs. The targeted goals for implementing this mass public transportation policy are to achieve 60% of residents' trips via public transportation, a

road network speed of 35 km/h for road transport, and the establishment of safe, comfortable, and affordable conditions for rail, water, and air transport.

Resources for the Urban Transportation Policy for Bus Rapid Transit (BRT) in Medan City

The success of policy implementation largely depends on the ability to utilize available resources effectively. Resources in policy implementation encompass not only human resources but also non-human resources, including financial resources and time. These resources are essential to streamline the administrative aspects of policy implementation. Beyond human resources, financial resources and time are key factors in the successful implementation of the policy. The lack or limitation of funds or other incentives significantly contributes to policy implementation failures.

Human resources are the most critical factor in policy execution. Resources selected based on the principles of effectiveness and efficiency can drive successful policy implementation. Issues within the BRT transportation policy system also include challenges related to human resources directly involved in the system. From interviews with various informants, problems were identified regarding human resource management, including the welfare of organizational members supporting the BRT system and the overlap with other mass transport services sharing routes and corridors with Medan City's BRT system.

Inter-Organizational Communication and the Activities of Urban Transport Implementers for Bus Rapid Transit (BRT) in Medan City

In the implementation of public policy, communication between implementing parties is essential, as seen in the implementation of the Trans Mebidang policy that uses a Bus Rapid Transit (BRT) system. Research findings reveal that the BRT system in Medan City, designed with the Trans Mebidang concept, includes not only the BRT system but also a non-BRT system serving routes outside the Trans Mebidang corridor. This means that the implementers' activities involve both BRT and non-BRT systems. These two services—BRT and non-BRT—have distinct operational activities. The Trans Mebidang BRT service includes designated stops, while the non-BRT service uses simpler bus stops marked by posts for bus halting.

Characteristics of the Urban Transport Implementing Body for Bus Rapid Transit (BRT) in Medan City

Attention to the implementing agencies includes both formal and informal organizations involved in public policy implementation. This focus is crucial as the performance of public policy implementation is heavily influenced by the specific characteristics and suitability of these implementing agents. Additionally, the scope of policy implementation must be considered when determining the implementing agents. A broader policy implementation scope requires a larger number of involved agents. To maintain the exclusivity and connectivity of the Trans Mebidang BRT system routes, a specialized joint task force is needed as part of the public transportation policy implementation structure. This joint task force, known as Satgas, comprises police, the Medan Department of Transportation, the Medan Garrison, Propam, and municipal police. Smooth implementation of the Trans Mebidang BRT system policy requires coordination among Satgas members. Poor communication in coordination hinders the achievement of policy objectives. Effective communication must be conducted to ensure that messages are received and understood.

Economic, Social, and Political Environmental Conditions of Urban Transport Bus Rapid Transit (BRT) in Medan City

Various challenges are faced by implementers in carrying out public policy. These challenges include conditions within a country or region, such as economic, social, and political fluctuations, which can impact the implementation of a policy. The issues affecting the implementation of the Trans Mebidang public transportation policy are the economic, social, and political environment. In the development of the Trans Mebidang BRT system, which has been in place for several years, attention has been given not only to business orientation or profitability but also to social aspects that play a role in the development of the BRT system. Interviews with informants from the Department of Transportation reveal that social, economic, and political aspects significantly influence policy implementation within the BRT system. Policy implementation connects policy objectives and their realization with government activities. This aligns with Van Meter and Van Horn's view that the role of implementation is to create a network that enables the realization of public policy goals through the activities of government agencies involving various policy stakeholders. Van Meter and Van Horn’s policy implementation process model shows that success depends on elements within both political and administrative process models.

Attitudes and Tendencies (Disposition) of Urban Transport Implementers for Bus Rapid Transit (BRT) in Medan City

Among the many factors influencing policy implementation, the attitude of the implementers is crucial and cannot be overlooked. The implementation of the Bus Rapid Transit (BRT) policy will be effective if the implementers have a strong awareness, which means they not only understand their duties and have the capacity to carry them out but also feel a need to implement the policy. Therefore, the clarity of resources—human resources, supporting facilities, significant funding—is important; however, without a strong commitment and attitude from the implementers, the BRT policy may not proceed as expected. This means that the implementers' attitude is a factor worth considering for the successful implementation of the policy.

Generally, most implementers approach policy issues with traditional methods, meaning policy implementation remains passive, with little initiative from the implementers themselves. This passive stance is evident in one respondent’s statement. Commitment and consistency, which embody the attitude of the implementers in executing policy products, are essential qualities for each implementer as part of their entrusted duty. These qualities can foster new ideas and initiatives for the successful implementation of the BRT policy. Current realities, as reflected in the statement above, show that the BRT policy remains at a managerial level, with limited awareness at the implementer level.

Analysis of First and Last Mile Coverage for Medan City's BRT Service

The development of the BRT (Bus Rapid Transit) system must be complemented by the establishment and arrangement of safe, comfortable, and secure pedestrian and cyclist facilities in both the "origin" and "destination" areas, such as commercial districts, public facilities, and residential neighborhoods. Based on the assumption of a walking speed of 4.8 km/h and a comfortable walking time of 5 minutes for BRT users [18] it can be assumed that areas within a 500-meter radius from each station will benefit from potential access to the BRT stations. For cycling infrastructure, assuming the same travel time of 5 minutes at a cyclist speed of 15 km/h, the accessible radius is approximately 1.25 km from each station.

In the implementation for Medan's BRT, this radius will be applied across all stations along the Pinang Baris Terminal to Amplas Terminal corridor, as this corridor meets the BRT planning standards in terms of infrastructure and can thus serve as a model for other BRT routes. After

identifying buildings as Points of Interest (PoIs), these points are connected through the available road network. Roads with the highest concentration of PoIs are prioritized and linked to other streets to create a network focused on enhancing pedestrian and cyclist infrastructure. This network can serve as a reference for the Medan City Government in road infrastructure improvement programs based on BRT service coverage [19].

Area-Based BRT Accessibility Improvement

In reviewing the development activities and BRT accessibility analysis around the Lapangan Merdeka and Kesawan areas, in addition to a station-based approach, an area-based approach is also required. This is not only to enhance BRT accessibility within the area but also to support the Medan Old Town district's potential as an intermodal service integration point. Furthermore, it aligns area development with a low-emission zone (LEZ) approach, transforming the area into a historical tourism destination and a central business district in Medan City. The development of typologies for these roads is based on field data and desktop surveys, which include vehicle volume from traffic counts conducted in April 2022, typical traffic density during peak hours, the largest vehicle size passing through, parking conditions, and transportation plans for the road (public transport, sidewalk arrangement, and bicycle infrastructure network).

BRT Stations in Medan City

The station design will adhere to the 2018 recommendations, with the physical station located in the median of the road, flanked by two BRT lanes. Adjustments have been made for mixed traffic, where the lanes directed towards Jalan Bukit Barisan remain two lanes without a median between the right-side BRT lane and the mixed traffic lane. This lane consistency results in a slight reduction in pedestrian space on the right side, though it still meets existing standards. The station layout, existing conditions, initial recommendations, and final recommendations for this station are illustrated in the figure below.

Figure 2. Recommended Layout and Illustration of the BRT Station at Merdeka Walk/Merdeka Square

Conclusion

Based on the findings and discussion in the previous chapter, the following conclusions can be drawn:

The Medan City Government is currently undertaking large-scale urban mobility development projects with two primary initiatives: the construction of the Bus Rapid Transit (BRT) system and the development of the Kesawan and Merdeka Square areas. Both projects emphasize the importance of pedestrian and cyclist infrastructure, making it easier for Medan residents to access public transportation. These initiatives reflect positive efforts by the Medan City Government toward sustainable urban mobility development, while ensuring that quality public transportation is accessible across all areas of Medan.

The research findings indicate that the implementation of the Bus Rapid Transit (BRT)-based urban transportation policy aimed at creating an equitable and sustainable public transport system in North Sumatra Province has not yet been optimal, facing limitations in areas such as planning, fare and payment systems, operations, and policy oversight. While the policy has positively impacted traffic congestion and organized the urban transportation system, it still leaves challenges to be addressed.

This policy implementation tends to follow a "predict and provide" approach, focusing on addressing urban traffic congestion and disorder, often overlooking fairness for transport users and other development stakeholders who contribute to public transportation efforts.

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