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THE IMPACTS OF PUBLIC TRANSPORTATION POLICY ON BUS RAPID TRANSIT OPERATIONAL IN THE METROPOLITAN JAKARTA

PENGARUH KEBIJAKAN TRANSPORTASI PUBLIK TERHADAP OPERASIONAL BUS RAPID TRANSIT DI KOTA METROPOLITAN JAKARTA

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ABSTRACT
The public transportation planning has an essential role in traffic accessibility management. As the urban population grows, the traffic issues also significantly rise and more complex. The problems are traffic casualties, traffic jams, air pollution, and other severe issues. Meanwhile, the DKI Jakarta managed a regulation number 10 in 2014 regarding the bus rapid transit operation in the metropolitan area. Unfortunately, the private vehicle is still favorable since public buses have many drawbacks, particularly in transportation integration and service. The research aims to analyse the impact of public transport policy on Bus Rapid Transit operation in Metropolitan Jakarta. The methodology applies a qualitative approach, where it analyses the current condition of transportation problems. Besides, a deep review of the Master Transportation Plan is conducted to evaluate the potential problems in Bus Rapid Transit Operation. Following that, the impact of transport policy consists of direct impact, indirect impact, and cumulative impact. The PESTEL analysis applies to study the social, economi, environmental, infrastructure, and regulation in BRT management. The result indicated that the social, economic, and environmental aspect has a direct impact on BRT operation. Meanwhile, only the infrastructure aspect is classified as indirect impact since the integration modes only related to the transport demand. Finally, the mitigation strategy is formulated to overcome the BRT problems in Metropolitan Jakarta.

Keywords: *Bus Rapid Transit, Public Transport Policy, Urban Transport Sustainability*

ABSTRAK
Perencanaan transportasi publik memiliki peran yang sangat penting terhadap aksesibilitas lalu-lintas di kawasan perkotaan. Seiring dengan bertambahnya jumlah penduduk, permasalahan transportasi menjadi sangat kompleks seperti pengguna kendaraan bermotor yang semakin tinggi, kecelakaan lalu-lintas, serta permasalahan polusi udara yang semakin tidak terkendali. Disisi lain, pemerintah Kota DKI Jakarta telah mengeluarkan peraturan nomor 10 tahun 2014 terkait kebijakan operasional *bus rapid transit*/angkutan umum sebagai moda transportasi. Namun, kenyataannya masih terdapat banyak kelemahan dalam pelaksanaannya, seperti jadwal BRT yang tidak tepat waktu, pelayanan yang kurang baik, moda yang tidak terintegrasi dengan moda transportasi lain, keterjangkauan armada yang rendah, serta jalur BRT yang digunakan oleh pengendara kendaraan bermotor. Penelitian ini bertujuan untuk menganalisis pengaruh kebijakan transportasi publik terhadap operasional *Bus Rapid Transit* di Kota Metropolitan Jakarta. Pendekatan dalam penelitian ini adalah pendekatan kualitatif, dimana peneliti mengkaji secara mendalam kebijakan transportasi publik yaitu *bus rapid transit* beserta kualitas pelayanannya. Disamping itu, dilakukan review terkait rencana induk transportasi DKI Jakarta untuk melihat seperti apa dampak kebijakan transportasi publik terhadap operasional BRT, baik dampak secara langsung, tidak langsung, dan akumulasinya di masa mendatang. Teknik analisis yang digunakan adalah PESTEL analisis, yang mengkaji secara rinci terkait kondisi politik, ekonomi, infrastruktur, sosial, lingkungan, dan hukum. Hasil analisis menunjukkan bahwa aspek sosial, ekonomi, politik dan hukum memiliki dampak secara langsung terhadap kebijakan transportasi publik. Sementara itu, hanya aspek infrastruktur yang memiliki dampak secara tidak langsung terhadap kebijakan transportasi publik, karena integrasi moda transportasi memiliki hubungan secara tidak langsung terhadap permintaan moda angkutan umum. Kemudian,

akumulasi dampak kebijakan transportasi terhadap berbagai aspek dan strategi mitigasi dilakukan dalam mewujudkan transportasi berkelanjutan di kawasan Metropolitan Jakarta di masa mendatang.

Kata Kunci : *Bus Rapid Transit, Kebijakan Transportasi Publik, Transportasi Berkelanjutan*

1. INTRODUCTION

Recently, policymakers have received attention about the necessity of good integration of the public transportation system. Nowadays, many cities and travellers are being encouraged to create active transportation modes like walking, cycling, or public transportation (Tansawat et al., 2015). Besides, many government authorities have started to invest their budget in developing and improving the quality of public transport services (Vassallo et al., 2012). A regional plan is typically developed to outline the changes in the existing transport plan and transform it into an integrated system to reach urban transport sustainability (Joewono et al., 2016). On the one hand, public transportation in Indonesia, particularly in metropolitan Jakarta, has been causing concern among local governments since its passengers have significantly decreased over the last three years. Whereas the number of car ownerships shows an upward trend, and it triggers transportation problems like casualties, traffic congestion, and severe traffic jam (Rachman et al., 2021). Moreover, the DKI Jakarta is the capital city of Indonesia with about 11 million habitants, and it is very popular as the densest, most congested, and most crowded region in Indonesia.

Surprisingly, more car ownerships are decreasing the demand for public transport, and the use of cars and motorbikes has become more attractive. In addition, the decentralized system of government in Indonesia also causes many drawbacks to the integration of urban planning and contributes to the vicious circle in transportation management. Unfortunately, there is no metropolitan agency responsible for regulating and managing the metropolitan Jakarta, particularly in coordinating public transportation systems between the DKI Jakarta and its surrounding areas like Bus Rapid Transit (BRT), Light Rapid Transit (LRT), Mass Rapid Transit (MRT) and other public transportation. Thus, the idea of sustainability of transportation has not been accomplished yet.

This paper aims to explore and compare the overall impacts of public transport policy on bus rapid transit in Metropolitan Jakarta. Then this paper also provides future strategies to develop better public transportation in Metropolitan Jakarta. So, these strategies will provide a basis for future policies such that systems being implemented to encourage people to use public transportation.

2. PUBLIC TRANSPORTATION

2.1. Sutainable Transportation

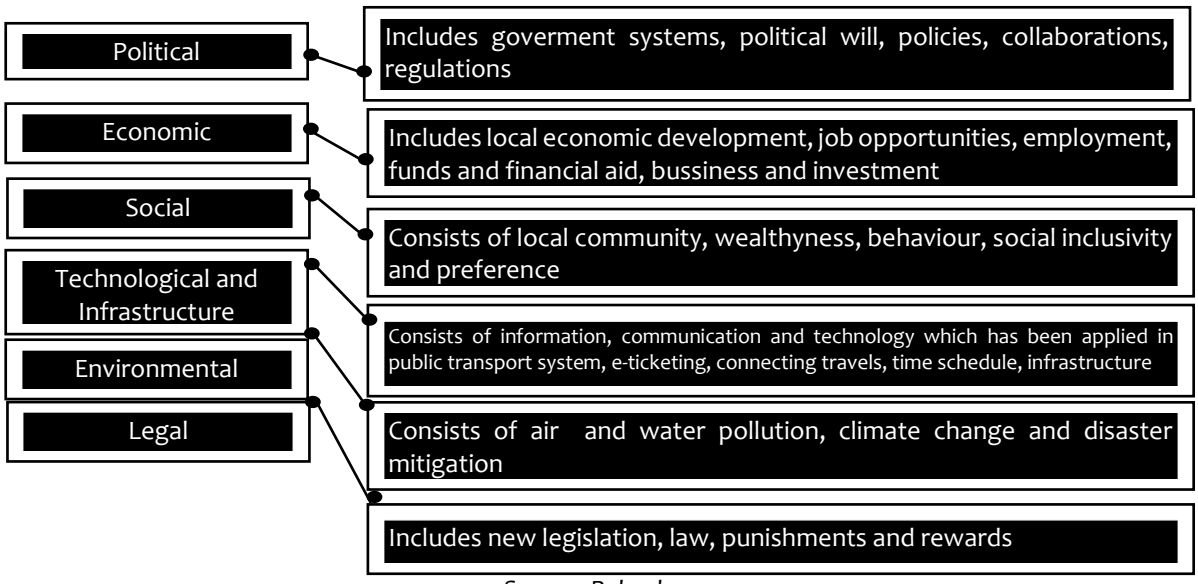
Urban public transportation development is entering a new era with the emergence of the sustainability transportation concept (Ilahi et al., 2021). Meanwhile, there are three indicators; economic aspect, social and environmental indicators. Firstly, from the economic aspect, the transportation system must support economic vitality while developing proper infrastructure and encouraging social ability and willingness to pay. Secondly, social criteria relate to the social need to make mobility easier, safer, accessible, and comfortable. In general, sustainable transportation accentuates the importance of accessibility for transportation users, synchronizing policies on the spatial plan, transportation, and environment, and primarily creating an environmentally friendly transportation system and decreasing greenhouse gas emissions. In contrast, the environmental aspect requires a suitable solution that strengthens the development of the natural environment and empowers natural environment policy, reduces emissions, and discourages the usage of un-renewable resources (Hall, 2011).

The idea of sustainable transportation now has been globally addressed in a local transportation planning since it provides positive impacts toward environment, social, economic sectors. Following that, the

transportation problems need a serious action from the local authority to provide suitable policy on how to redesign and renew the spatial planning in order to improve the transportation management to attract more passengers by using a public transportation (Nawangsari & Ismaili, 2022; Septiawati & Basuki, 2017).

2.2. PESTEL Framework

The PESTEL framework is a primary environmental analytical tool that has been predominantly used to assess the transportation sector with environmental aspects (Mckinnon & Kreie, 2010). Meanwhile, the PESTEL framework consists of political, economic, social, technological, environmental, and legal elements. So, this framework provides future development which considers external factors and is applicable to identify the interdependencies among the macro-environmental context, individual context, technology, and social cohesion (de Sousa & Castañeda-Ayarza, 2022; Fernandes, 2019). Consequently, it is essential to layout, contextualize and analyze the current impacts of bus rapid transit in Metropolitan Jakarta to achieve public transportation sustainability in the future. The PESTEL analysis is used since the scope of this research focuses on the public transport policy; political, economic, social, technological and infrastructure, environmental and legal aspect that is suitable with the research aim in order to analyse the impact of public transportation policy on the operational of Bus Rapid Transit. Below Figure 1 represents the PESTEL framework in the public transport system.



Source: Belwal, 2017

Figure 1. PESTEL Framework

2.2.1. Political Aspect

The role and responsibility of the government system are needed to develop an integrated public transportation system. Moreover, most public transportation in developing countries has poor public transportation systems, and it requires good political will (Sohail et al., 2006). Besides, government support is crucial in transport regulations, integration and coordination among stakeholders. Therefore, land use and urban planning management, environmental protection, and road safety policies must be applied to become sustainable.

2.2.2. Economic Aspect

Indeed, a Public transportation can act as a generator to generate multiplier investments in many sectors. For example, in the Poland, where every $1 billion invested in public transport capital and operation created about 36.000 jobs, and for every $5 invested in public transport, at least $4 is generated for economic

growth (Bank, 2016). Consequently, it helps many local communities have good access to many job fields and employments. Following that, if the transport system is well connected with land-use diversity, it is expected that there will be plenty of job opportunities that emerge and help local economic development, particularly for low-income people.

2.2.3. Social Aspect

Indeed, social policies in the transportation sector, which aim to improve human well-being and enhance the people's capacity to fulfill their productive potential, are a newly defined territory (Andrijcic et al., 2013; Lieszkovszky, 2018). In addition, a study on new transport initiatives deprived of neighborhoods in the UK concludes that public transport services are really important components for social inclusion to keep the vitality and vibrancy of low-income households. It is widely believed that middle- to low-income households mainly rely on public transportation and usually have longer travel journeys than middle- to high-income groups. So, the local government must consider the appropriate bus shelter in many land-use activities to ease their mobility and safety (Alterkawi, 2006). As a result, other factors such as social and cultural environment also affect an individual choice and preference whether to use public transportation or not.

2.2.4. Technological and Infrastructural Aspect

The rapid development of technology now has been made easier for people to travel since the e-commerce applications are more favorable and downloadable. In transportation field, the sophisticated of technology definitely lead people to choose the best service during travel, and now Indonesia has two well-known applications (Gojek and Grab) in which provide more service coverage than Bus Rapid Transit (BRT) in The Metropolitan Jakarta. Consequently, the services and infrastructures of Bus Rapid Transit must be improved in order to gain more revenue (Afriza & Manullang, 2020; Rakhmatulloh et al., 2019).

Technical, operational, and infrastructural are among the most essential elements to achieving public transport sustainability. Many countries in different parts of the world struggle and suffer to develop a good public transportation framework and management. Thus, it takes good solutions and critical decisions to meet the local transport requirements (Belwal, 2017a). Meanwhile, to be successful, the public transport network also needs to be well-integrated, customer-oriented, highly secure, and convenient.

In other words, the criteria should be fulfilled by (1) network integration, (2) integrated time transfer, (3) integrated physical connection for transfer, (4) smart technology and innovation, (5) fare, ticketing, and schedule information.

2.2.5. Environmental Aspect

These days, environmental aspects have been a serious concern among experts. Moreover, the most contributions to environmental degradation come from transportation usage, uncontrolled number of private vehicles, poor and unreliable public transportation modes, and indisciplined behavior of road users, particularly in developing countries.

In fact, in this motorization era, where every household belongs to at least one car and several motorbikes show an upward trend, it causes air pollution and severe road transportation problems (Hysing, 2009). Since the transport sector's share has significantly risen and worsened environmental degradation, many environmentalists, social communities, and governments collaboratively work to cope and reach environmental sustainability by proposing an Environmental Impact Assessment (EIA) in every urban project.

2.2.6. Legal Aspect

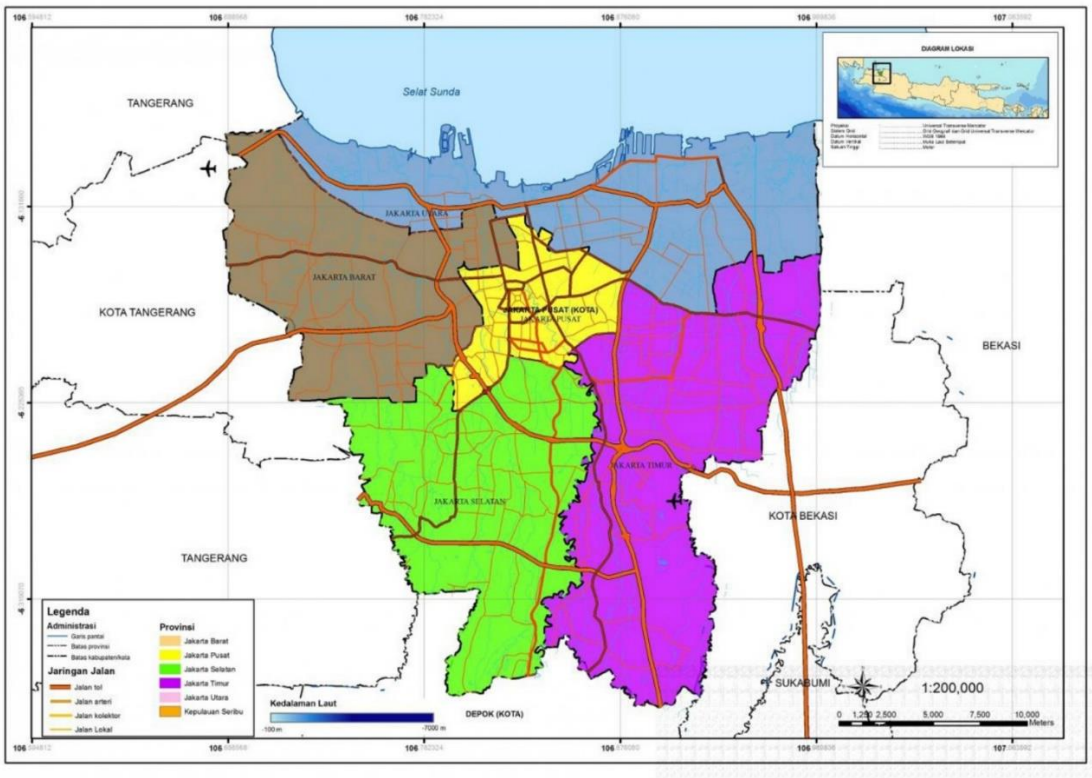
Legal and regulation aim to protect and control the management of public transportation operations, such as regulating the fares, bus shelter locations, operators, licenses, vehicles emission, speed limits, transport service providers, and the procedures for vehicle inspections and maintenance as well (Sohail et

al., 2006). Moreover, regulation works as a quasi-legal process in the transport sector where it introduces quality and safety standards in public transport modes.

3. DATA AND METHODS

This research is categorized as qualitative research. Qualitative research concerns how people interpret their experiences, construct their words, and what meaning they attribute to their experiences (Butina et al., 2015). Besides, this research applies the PESTEL framework (this acronym is based on the words of political, economic, social, technological, environmental, and legal factors) from Evans and Richardson's theory (Mckinnon & Kreie, 2010). Following their theory, this analysis has been used to organize and review the impacts of public transport policy on bus rapid transit to identify the current stakeholders in Metropolitan Jakarta. Then, secondary data is collected from a wide range of resources, such as articles, urban transportation data Websites, journals, document reports, local newspapers, and other scientific publications. Lastly, mitigation strategies will be provided to cope with the transportation problems, and some policy recommendations will also be formulated.

This research is situated in Metropolitan Jakarta, where the population number reached about 10,8 million inhabitants in 2021 (Jakarta Statistical Data, 2021). The metropolitan area consists of three provincial governments and nine district governments called JABODETABEK (Jakarta, Bogor, Depok, Tangerang, Bekasi, Puncak, Cianjur). Moreover, Jakarta and its surrounding cities (Metropolitan region) were formed in 2007 based on Presidential Decree Number 54 the Year 2007. Interestingly, two new cities have recently joined the metropolitan region: Puncak and Cianjur. So, the urban areas become wider and more transportation systems become very dynamic and complex. Below figure 2 shows the study area map of the research.



Source: Jakarta Open Data, 2023

Figure 2. The Map of Metropolitan Jakarta

4. RESULT AND DISCUSSION

In general, it is widely believed that most developing countries have a common problem with road transportation. In Indonesia, the number of private ownership significantly increase, and causes many road transportation problems. Besides, public transportation has also several drawbacks, such as infrequent travel time, disintegrated with pedestrian paths, and sometimes accidents occur between the Transjakarta and private vehicles since many road offenders use Transjakarta lines as their way. According to those problems, most people in Metropolitan Jakarta still prefer to ride a private car or motorbike rather than using Transjakarta.

The previous theories argued that policymakers have received attention about the necessity of good integration of the public transportation system. Thus, since the BRT infrastructures lead to a significant changes in the built environment and distribution of space, its implementation is expected to considerably alter the travelers transportation mode. Furthemore, many cities and travellers are now being encouraged to create active transportation modes like walking, cycling, or public transportation (Tansawat et al., 2015). However, the decision making process in bus rapid transit management is highly political perspective alone, particularly in low and middle –income countries which are locked into car-centric transport system and it now becomes a critical policy and strategy to implement sustainable transportation (Goedeking, 2024). Following that, most developed countries have already certain standards and operational procedures, as the challenges are often in political dynamic, political feedback: backlash (e.g., from users and/or car owners) can lead to operational issues, which can feed more backlash. If left unchecked, such cycles result in perpetual financial instability, loss of political legitimacy, and even closure.

The description below will explain the impacts of bus rapid transit on political, economic, social, technological and infrastructural, environmental, and legal perspectives on bus rapid transit in Metropolitan Jakarta.

4.1. Direct Impact of Bus Rapid Transit Project

The provision of public transportation works as a generator system which gives many paybacks toward many sectors, particularly on social communities. Besides, the criteria of good public transportation aspects have to be comfortable, safe, accessible, well-integrated, and affordable to encourage people to move from private vehicles to public transportation. The direct impacts of bus rapid transit (Transjakarta) on social, economic, political, legal, and environmental aspects will be explained below;

a. Political, Legal, and Regulatory

There are about seven institutions who control the Transjakarta operation such as (1) the ministry of transportation, (2) the transportation agency of Jakarta, (3) the development cooperation agency, (4) the Jakarta transportation council, (5) the Indonesia transport society, (6) the organization of land transportation, and (7) the institute for transportation and development policy. Although many actors involve in Transjakarta, there is lacking audits in Transjakarta, and it also potentially creates a chance of corruption and bribe from the private company through tendering process to get favours in return (Vanclay, 2012). Moreover, the regulations overlap and confuse many actors to make a policy.

It is widely believed that a decentralized system in Indonesia causes many government agencies established at each level (national, provincial and local levels). Consequently, it triggers the autonomy to manage their public transportation affairs in their territory. Unfortunately, the system has several impacts on transportation planning and management in metropolitan Jakarta, such as (1) lack of harmony in coordination between the metropolitan Jakarta dan it's surrounding (urban areas) like Jakarta, Bogor, Depok, Tangerang, Bekasi, Puncak, and Cianjur (Jabodetabekpunjur). Following that, (2) fragmentations in planning, management and funding framework cause overlapping in their role and responsibility to run a good commitment in transportation management, and (3) travel demand growth has not been accommodated by a good public transport provision. In addition, most people use private vehicles, and the strong penetration has exacerbated it from the manufacturers of private cars to make people have a car easily.

However, the policies which control private vehicles number, such as confinement of vehicle purchasing, can not be applied properly in Indonesia since it is related to the automotive industry actors and government. Besides, controlling private ridership will harm automotive industries, which will lose their market share in Indonesia. Furthermore, the local government will also suffer a decrease in tax revenue (vehicle tax) and against the individual right to own public goods.

After tendering into a private company, the policy debates over Bus Rapid Transit management have long been an issue. The bureaucratic system prevents the resolution of the problems encountered by private companies because the dominant market player has strong political connections, enabling it to require contracts. The bureaucratic system hinders effective monitoring and performance evaluation given the insufficient political will and support. Bottom lines, the lack of adequate institutional structures has been identified in the case of Transjakarta, and the implementation of Transjakata will be significantly assisted if adequately structured and capacitated formal transport authorities could be established to monitor the public transportation plan.

b. Economy

Indeed, the massive number of private vehicles in Indonesia has begun since the 1970s, particularly during the beginning of the economic improvement rate in Indonesia. Following that, credit applications for motorbikes become easier with lower down payment and interest, which accounts for the increasing rate of vehicles sold in metropolitan Jakarta. The data showed that the number of cars sold in Jakarta contributed to 167.992 units in the mid of June, while this share was sevenfold more than in May 2021 (39.851 units). But, the emergence of Transjakarta is still in very poor condition. Moreover, despite the global economic crisis, sustainable transits are still found on the top agenda in many countries and cities, and it represents a higher level of political commitment (Furzer, 2013).

Nonetheless, the operation of Transjakarta provides a wide range of job opportunities starting from the construction process of the bus shelter until the management and maintenance phases. Therefore, it also generates more income in low-skilled labor without having sufficient education to be a permanent driver or operator in Transjakarta. Besides, it reduces the unemployment rate and decreases fuel consumption in Metropolitan Jakarta. Although, not every informal or traditional driver could be a driver or operator in Transjakarta now that there are some competitions and qualifications to be fulfilled. As a result, only a few informal drivers were absorbed into the formal driver in Transjakarta.

On the other hand, financial problems occur in the operation of Transjakarta, such as a lack of budget for maintaining the trans-Jakarta facilities, pedestrian revitalization, lane construction, bus shelter development, and other facilities. Unfortunately, the problems also relate to formal and informal public transportation competitions. In addition, most informal public transportation disagree with the Transjakarta Office now that their income has considerably dropped since the operation of Transjakata. Also, the expansion of Transjakarta routes has made many informal drivers feel insecure, anxious, and afraid about the sustainability of their business because passengers are likely to move and choose Transjakarta. As a result, it plummets the daily income of traditional or informal drivers or even closes down their businesses. Following that, people are also losing other job fields like parking attendants because Transjakarta has its parking area or bus stop.

All in all, there are many benefits to using Transjakarta. However, several negative impacts are worth considering in the DKI Government to minimize the social issues, improve the economic sector, and achieve sustainable transportation in the metropolitan region.

c. Social

Social policy in transport aims to improve personal wealth and raise the capability of people to fulfill their mobility without any major problems. The availability of Transjakarta also helps to increase the social inclusion, vitality, and vibrancy of low-income people without social segregation. Meanwhile, the social and cultural environment affects individuals' rise to use public transit.

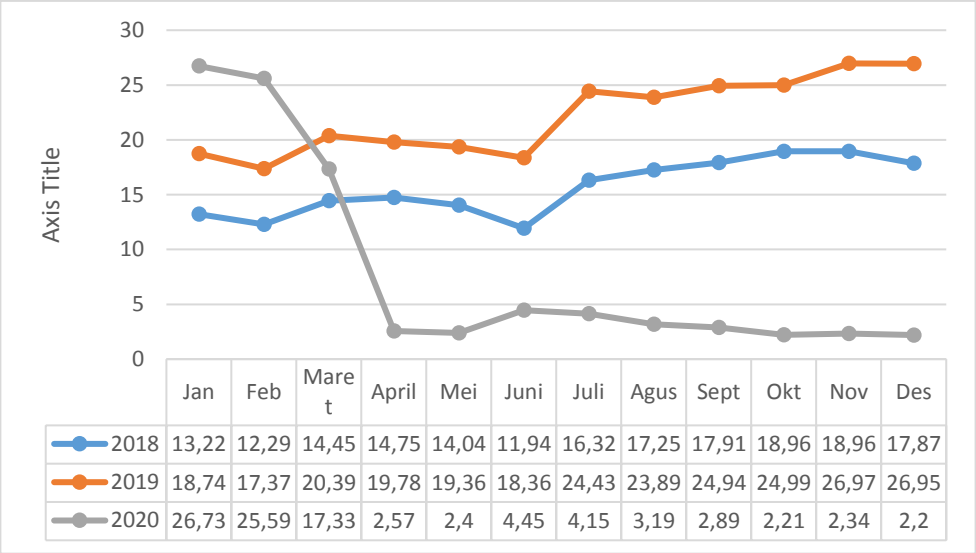
On the one hand, the development of the Transjakarta policy could also decrease the number of casualties like motorbikes or car accidents. Statistical Data in DKI Jakarta in 2021 reported a significant increase in the number of vehicles registered over the last ten years. Moreover, the latest vehicles recorded about 30.839. 921 units in 2021, while in 2018, this number contributed to 11.762.763 units. Alternatively, using Transjakarta could undoubtedly reduce the accidents and any casualties. In addition, using Transjakarta is likely to raise social cohesion and integration since many passengers come from different regions (urban area and urban fringe), and it potentially decreases any social stratification. Besides, the emergence of Transjakarta could decrease air and noise pollution, particularly from car ownerships (2.805.989 units) and motorbike ownerships (8.194.590 units), which are the most significant contributors to environmental degradation in Metropolitan Jakarta.

On the other hand, the DKI Jakarta Government has initially promised the informal transport owners like taxis, vans, buses, and super vans to be transferred as formal officers (ticket service, driver, security) in Transjakarta. However, later the government changes the system become tendering processes to the private sectors. Ever since the operation of Transjakarta was managed by a private sector, the job recruitments are selected by a private company without recruiting any informal drivers (bus, minibus). Consequently, the informal drivers seemed disbelieved to the DKI Jakarta Government and discouraged any transportation regulations. Moreover, after the private sector had managed Transjakarta through a tendering system, the service quality still failed to conform to the standards outlined in the expected development path, such as lack of pedestrian path, insufficient information board, shortage of seats in the shelter, and not disability friendly. Afterward, most private enterprises earned lower-than-expected revenues, compelling them to reduce services performance favoring guaranteed profits. As a result, the slowly development of the Bus Rapid Transit system, increasing demand for personal transportation, serious congestion on the main road in the heart city, and low operating efficiency of BRT.

d. Environment

Since the transport sector is responsible for ecological degradation, a growing interest is being given to transport features, especially urban transport, as a sub-policy area for significant environmental improvement (Hysing, 2009). The environment is the most affected aspect of the transportation sector. Besides, most people show a considerable increase in using private instead of public transportation. Meanwhile, since the operation of Transjakarta, the number of passengers, mainly from sub-urban (Bogor, Depok, Tangerang, Bekasi, Puncak, Cianjur), shows an increased heading to the central business district (CBD). Interestingly, it can gradually positively impact creating a healthier environment in Metropolitan Jakarta.

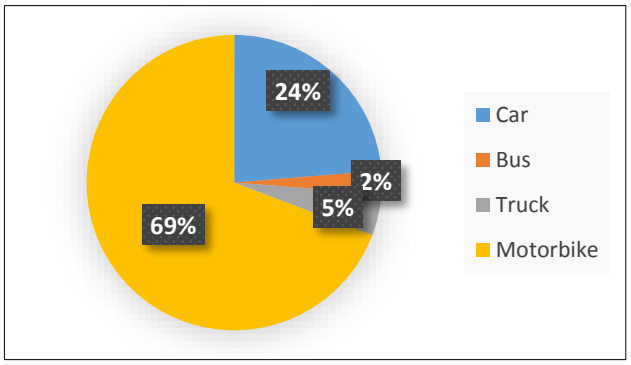
Generally, severe traffic pollution has adversely affected most areas in the DKI Jakarta metropolitan region. Nowadays, the government of metropolitan Jakarta has started to reform the internal system of Transjakarta and makes some changes in public transportation policy to reduce traffic congestion. Alternatively, the government provides and improves the Transjakarta lanes and facilities with better infrastructures. Therefore, more improvements in congested streets with exclusive lanes boost Transjakarta and service reliability. The government of the DKI Metropolitan region also enables subsidies and makes the fares much cheaper. Following that, the government also endeavors to raise the attraction of public transport by re-structuring the tendering system with private sectors and pushing private sectors to integrate the tickets and schedules into the various transport system/ integrated urban transportation management.



	Jan	Feb	Maret	April	Mei	Juni	Juli	Agus	Sept	Okt	Nov	Des
2018	13,22	12,29	14,45	14,75	14,04	11,94	16,32	17,25	17,91	18,96	18,96	17,87
2019	18,74	17,37	20,39	19,78	19,36	18,36	24,43	23,89	24,94	24,99	26,97	26,95
2020	26,73	25,59	17,33	2,57	2,4	4,45	4,15	3,19	2,89	2,21	2,34	2,2

Source: http://statistik.jakarta.go.id/jumlah-penumpang-transjakarta-tahun-2018-2020/, Downloaded on 18th January 2024

Figure 3. Transjakarta Passengers between 2018-2020 (in Millions)



Source: Statistical Bureaucratic Agency in DKI Jakarta

Figure 4. Total of Private Vehicle Ownership in DKI Jakarta in 2021

The figure 4 provides information about the fluctuations of trans-Jakarta passengers in 2021. Ever since the government of the metropolitan region has made some changes in trans Jakarta management and services, it has succeeded in attracting more people in Jakarta, Bogor, Depok, Tangerang, Bekasi, Puncak, Cianjur (Jabodetabekpunjur) to use Transjakarta. Interestingly in figure 3, before the pandemic attacked Indonesia, the number of passengers who used trans Jakarta contributed to nearly 17 million in December 2018, while in December 2019, this figure significantly increased to reach about 27 million in 2019. Besides, the average number of passengers who used trans Jakarta was about 1.5 million per day in 2021. Unfortunately, when Covid-19 hit Indonesia, the percentage of trans-Jakarta passengers drastically dropped to about 2.20 million in December 2020 (Dinas Perhubungan DKI, 2020). On the other hand, the healthy protocol during travel and new regulations like working from home reduces the number of passengers since people are worried about infectious and dreadful diseases.

However, the improvements in trans-Jakarta facilities and management like e-ticketing, disability lanes, pedestrian-friendly paths, and integration with various public transportations have slightly reduced air pollution and noise pollution. As a result, issues about the exhaustion of unrenewable fuel reserves can be managed directly.

Eventually, the government of the metropolitan region also has to seriously think about the solutions for informal drivers who lose their passengers by making a contract or consortium and making a new policy to help their economic situations in the near future.

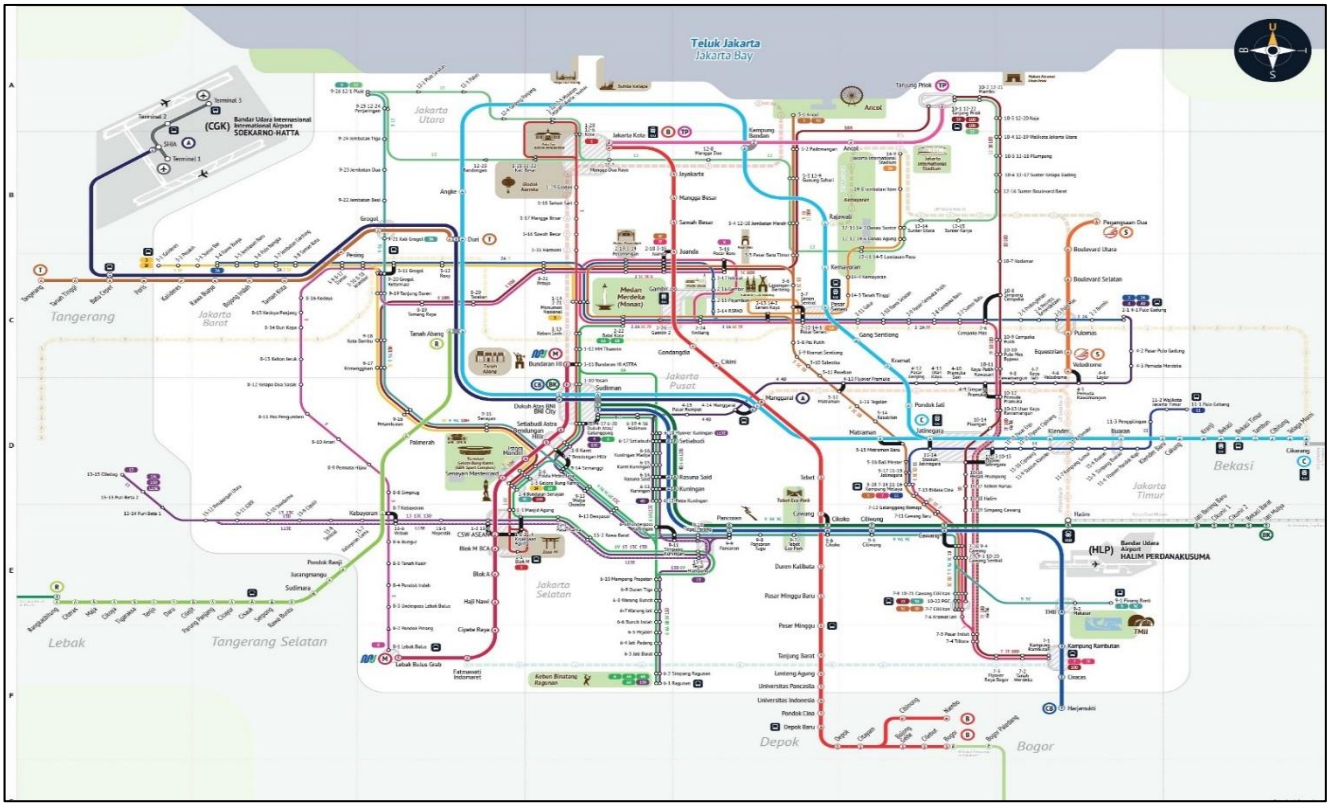
4.2. Indirect Impact of Bus Rapid Transit Project

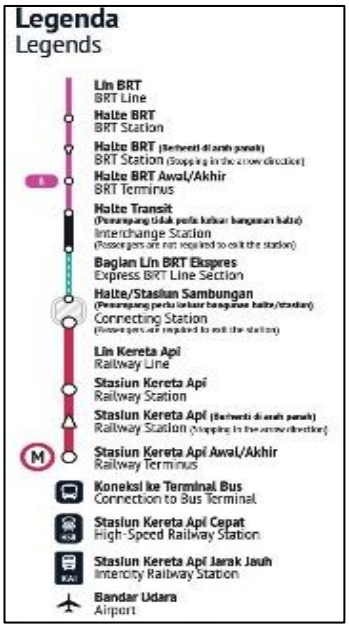
The indirect impact of Transjakarta is related to the development and infrastructure process. Public transportation priority indicates a disintegration in public transport in Jakarta with the surrounding area (Bogor, Depok, Tangerang, Bekasi, Puncak, Cianjur). In responding to these problems, the stakeholders should find proper solutions and overcome these critical issues collaboratively at provincial and local levels. Besides, Trans Jakarta needs to revise and re-evaluate the urban transport planning comprehensively from the perspective of social, economic, and political agendas. Therefore, the government needs to see the economic viability, social cohesion, land management, and public transportation equally, and the trans-Jakarta project needs an integrated and well-connected transportation mode with various transport systems to reduce motorization.

In general, the compact city (mixed-land use) is likely to be addressed in urban planning to support the public transportation agenda in metropolitan Jakarta and reduce the urban-sprawling phenomenon. The public transport network must be well-integrated, well- infrastructured, pervasive, customer-oriented, and convenient to attract more passengers in the future. Afterward, mobility constraints can be solved by developing synergies between stakeholders (residents, government, non-government, businesses, associations, elected representatives, to maximize the capacity of public transportation developments.

On the other hand, the indirect impact of social assessment in the trans-Jakarta project is also related to the integration between Transjakarta and different transportation modes (public bus, taxi, van, mass rapid transit, railways) because it is highly likely to be able to reduce any casualties and traffic jams. In addition, public transport integration makes it easier for people to move or travel from one place to other places safely and conveniently.

The figure 5 provides information about the Transjakarta corridors and lanes where it has been integrated with transportation modes such as bus, minibus, railways, and mass rapid transit. These days, Transjakarta has 12 corridors and 15 main corridors have been spread through Metropolitan areas. The corridors are (Blok M - Kota, Harmoni - Pulo Gadung, Kalideres - Pasar Baru, Pulogadung - Dukuh Atas 2, Ancol - Kampung Melayu, Ragunan - Dukuh Atas 2, Kampung Rambutan - Kampung Melayu, Lebak Bulus - Harmoni, Pinang Ranti - Pluit, Tanjung Priok - PGC 2, Kampung Melayu - Pulo Gebang, Pluit - Tanjung Priok, Ciledug - Kapten Tendean).





Source: Transportation Agency of DKI Jakarta, 2023

Figure 5. Transjakarta Public Transportation Networks

4.3. Cumulative Impact of Bus Rapid Transit Project

The cumulative impact of the trans-Jakarta project globally deals with the accumulation of social, economic, political and legal, environmental, and infrastructure elements. In other words, there are still problems regarding the management and operation of urban transport sustainability in the metropolitan region. Meanwhile, the cumulative impact on social issues triggers unemployment and raises the poverty level in low - income people, particularly for informal drivers. Afterward, the presence of Trans Jakarta leads to the lack of awareness and the absence of paradigm changes to concurrently preserve the environment. Besides, the cumulative impact of Trans Jakarta on economic view is the reduction of job opportunities for informal drivers in a public bus, taxi, or other traditional public transportation now that the Trans Jakarta has expanded its services until urban fringe and decreased conventional driver's income. At the same time, the local community cannot still directly participate in transport management (planning, implementation, and monitoring) since the autonomy power at the government level. As a result, the Trans Jakarta project has not embraced the whole elements equally because the bureaucratic system still uses top - down planning.

Interestingly, the trans-Jakarta project positively impacts the environment and declined air and noise pollution, particularly in the heart of Jakarta City. However, most people in the metropolitan region still prefer to use private vehicles instead of public transportation because some BRT has not integrated with other public transport. Fortunately, the government of metropolitan Jakarta now has been formulating and managing strategies to improve their services to attract more people to use bus rapid transit (Trans Jakarta). Meanwhile, the infrastructure also positively impacts public transportation in the metropolitan region now that the government of metropolitan Jakarta has recently improved the disability equipment in any Trans Jakarta shelter, so it is advantageous to reach social inclusivity. Below Table 1 represents the cumulative impact of Trans Jakarta.

Table 1. The Cumulative Impact of Trans-Jakarta on the Public Transportation System in the Metropolitan Jakarta

No	Aspect	Impact	Classification
1	Social	• Reduce the number of casualties and social stratifications • Improve social interactions and social inclusivity • Help to reduce the unemployment rate now that there are several employment opportunities available	Direct impact
2	Economic	• Create job opportunities to be operators and ticket attendants in the Trans Jakarta office • Increase the local economic income of households	Direct impact
3	Politic, Legal, and Regulation	• The tendering process makes the bureaucratic system top - down • Fragmentation between government and local community • The regulations have overlapped with other stakeholders • Lack of political will to deal with social conflicts • Shortage of financial budgeting in addressing public transportation	Direct impact
4	Environment	• Air and noise pollution tend to decrease in the heart of metropolitan Jakarta • The traffic congestion shows a slight reduction on main roads	Direct impact

No	Aspect	Impact	Classification
5	Infrastructure	• The provision of disability equipment in the bus shelter • Encourage social inclusivity • Several corridors have been integrated with several transportation modes	Indirect impact
6	Urban planning and management	• The idea of participatory planning is to engage the local community to be actively involved in the planning, implementing, and monitoring stages • The idea of a Compact city development concept with mixed-land use is needed.	Cumulative Impact

Source: Analysis, 2021

4.4. Mitigation Strategies to Overcome Public Transport Problems

In general, the transportation problems in Metropolitan Jakarta are very complex. Besides, it was affected by many factors, such as the indiscipline behavior of road users, low quality of public transportation, and lack of political will to deal with the transportation problems. However, since Metropolitan Jakarta has made a regulation and Macro Transportation Plan (PTM) in 2007, several strategies have been applied to tackle those problems. There are:

- The 3 in 1 policy has been stipulated in the governor decree number 4104 the year 2003 on the arrangement of traffic control area and the obligation to carry at least three passengers per vehicle on specific streets in DKI Jakarta. Besides, this policy limits private vehicle passengers to three persons from 07.00–09.00 am and 4.30-7.00 pm. However, this policy evokes another problem: the urge of 3 in 1 jockey. These 3 in 1 jockey are always present in every 3 in 1 street, and their number shows a significant rise, and it becomes a profession.
- Electronic Road Price (ERP) is a congestion charge imposed on private vehicle drivers on specific roads at a particular time so that a balance of demand (traffic) and supply (road availability) is expected to be reached. There are drawbacks like the absence of a legal basis for its implementation.
- The even-odd number policy appears to identify and register vehicles conducted by the police department (Polda Metro Jaya). Likewise, this policy undergoes pros and cons among citizens. While the pro side sees this policy as crucial in reducing the number of private vehicle usage, the cons consider this will evoke other problems, like corruption in vehicle plate number provisioning.

The complexity of policies has to be considered regarding public transportation development in the Jakarta metropolitan region because many drawbacks still happen. The complexity of transportation problems in the Metropolitan region becomes harder to overcome since the transportation policy has not been public transport oriented.

In responding to the current problems, the metropolitan government must mitigate any upcoming impacts and manage possible measures, re-assess the feasibility study, and change the bureaucratic system to become participatory planning, which involves the local community expressing and arguing their voices.

Furthermore, strategic transport planning is crucial to avoid poor transport services, resulting in traffic congestion, accidents, and inconvenience in transferring ridership. Besides, timely interventions and strategic urban planning could help mitigate the severe impacts of poor public transportation in societies. In this context, the drive toward nurturing good public transportation systems in Indonesia is important. Afterward, the development of a decent public transportation system could ameliorate the difficulties faced by the general public, especially the low - income households and families, in addressing safely commuting and ridership in social, economic, environmental, and political aspects.

On the other hand, a decent public transportation system is more equitable, and younger generations prefer it; and it reduces car usage and resource dependency, saves time and space, and supports investment

and economic stability. In addition, it also certainly raises human wealth (Newman, 2012). Nonetheless, there are several challenges in addressing sustainable transport systems in developing countries, like Indonesia, where most transport modes should have an integrative and provide high - quality services, curtailing the lure of private cars, rationalizing urban development policies, and institutional frameworks might be demanding on multiple factors. Below are several strategies to help the Bus Rapid Transit in the Metropolitan Jakarta:

a. Adopt transit-oriented development (TOD) and green public transport modes which accessible to all users

   The Indonesian government's concerns about the limited number of gasoline reserves and the atmospheric greenhouse effect have led to the TOD concept for future sustainable planning. It has been argued that transportation systems in metropolitan Jakarta nowadays have not considered the environmental aspects and are not sustainable because the number of traffic fatalities, ubiquitous roadway congestion, and severe air pollution shows an upward trend. So, applying the TOD concept to land use and transportation planning certainly could help the transportation problems in the metropolitan Jakarta, particularly to encourage people to use the Trans Jakarta where if the TOD has been applied, it is predicted that more people would like to use Trans Jakarta as their primary transportation modes. Furthermore, the government in metropolitan Jakarta could give more incentives and funds to encourage green public transport modes with less energy consumption, fewer emissions, and accessibility to all users (normal and disabled) regardless of age.

b. Encouraging public transport users to follow the new normal regulations during travels

   In this pandemic situation, all public transport users need to follow the health instructions from the local government, such as wearing a mask during travel, keeping 1-meter distance from other passengers, and staying away from any crowds. Besides, the metropolitan Jakarta has also reduced the capacity of trans-Jakarta to 50% occupancy only. Unfortunately, since the number of Covid-19 shows a significant rise in metropolitan Jakarta, the number of Trans Jakarta also considerably dropped than it used to.

c. Build more rapid transit alternatives

   The population number of metropolitan Jakarta will reach about 50 million in 2025. Furthermore, the number of people who use private transportation like cars and motorbikes has significantly risen over the past five years. Meanwhile, the urban fringe like Bogor, Depok, Tangerang, Bekasi, Puncak, and Cianjur contribute to more than a million and is less desirable in terms of public transportation. As a result, it is always crowded and congested on the main roads, particularly during the rush hours. On the other hand, the idea of Built more rapid transit could be applied or be a good solution to accelerate the provision of public transportation in the urban fringe, and it has to be well-connected to other ridership. Alternatively, the local governments could develop other rapid transit alternatives, such as exclusive bus lanes, rapid bus transit, light railway trains, and mass rapid transit, which are situated near bus shelters and pro pedestrians and walkable.

d. Integrate the intercity and urban public transport system

   The Jakarta metropolitan region consists of 3 provincial governments and nine district governments. So, integrating Trans Jakarta with other transportation modes, like bicycles, railways, rapid transit, and minibus, will undoubtedly favor public transportation users. Besides, integration of urban detail plans and urban public transportation, particularly in the suburban areas, is needed to overcome urban sprawling. The integration in public transportation divides into network integration, time transfer, physical integration, and connection for all public transport users. Moreover, since the Mas Rapid Transit has been developed in DKI Jakarta, it covers almost all Jakarta areas. But, several areas are still not well - integrated with Trans Jakarta. Promoting green public transportation is needed, and it has to be well - integrated with the urban transportation system.

e. Provide sufficient funds and investment for public transport planning

   In responding to the financial management of public transportation, the Jakarta transportation council has allocated and provided enough budget for public transportation by giving incentives and subsidies in Trans Jakarta operations. Meanwhile, the government could also apply the scheme of PPP (Public-

Private Partnership) to engage foreign companies that operate in the DKI Jakarta area to invest and financially support the Trans Jakarta project. Moreover, the tendering system applied in the operation of Trans Jakarta needs an honest evaluation and re-assessment to overcome any social conflicts, particularly among middle to low - income people who work as an informal drivers.

f. Engage local community participation in Public Transport Planning
Practically, public transportation is defined as a public entity where public participation is really necessary and crucial in determining urban transport sustainability. Besides, the current system applied in the Trans Jakarta is still top - down planning where there is less public participation involved in making decisions. As a result, many informal drivers are against Trans Jakarta because it replaces and reduces their daily income. However, the improvement of trans-Jakarta is urgently needed to overcome any environmental issues, but it still needs more improvements in the planning, organizing, actuating, and controlling management.

g. Promoting safe and secure public transportation in Pandemic Situations (Covid-19)
In this pandemic situation, the importance of pro-health instructions is needed to keep our journey safe. Moreover, it shows that the outbreak of Covid-19 victims in the DKI Jakarta has significantly risen and is categorized as one of the highest cases in Indonesia. Moreover, it is really dangerous for public transport users to use Trans Jakarta if they ignore the health protocol like 3M (Wearing a mask, keeping a 1-meter distance, and staying away from any crowds). Luckily, since Covid-19 attacked Indonesia in late 2019, the government of the Jakarta Metropolitan has started to reduce the capacity of occupancy for Trans Jakarta buses. They are also checking the passenger's temperature before getting the Trans Jakarta to cut down the vicious circle of Covid-19.

5. CONCLUSION

Public transportation management in The Metropolitan Jakarta is categorized low since the number of private vehicles shows a considerable rise. Therefore, the transportation policy in BRT is not effective in travel behavior changes. The main problems of the failure of public transportation are (1) the shortage of service coverage, (2) the timely arrival and schedule are not on time, (2) disintegration with other transportation modes, and (3) the unavailability of the park and rides in urban areas.

In general, the direct impact of public transportation on BRT can be seen in social, economic, environmental, and regulation. From the government's perspective, too many actors are involved causing a clash of interest and lack of responsibility in transportation management. As a result, the uncertainties in transportation regulation in BRT management happened. In terms of the economic impact, there was a shortage of financial allocation for shelter facilities, maintenance, and other costs. Consequently, It triggers the financial deficit. Afterward, the direct impact of BRT on the environment is severe traffic jams since the number of motorbikes uses the BRT line as their way, and sometimes it causes injuries, or death casualties.

The indirect effect of transport policy on BRT is insufficient transportation networks, while the BRT lines are not well - connected with other transportation modes. As a result, the passenger needs to seek and change the transportation by themselves. Indeed, the accessibility and integrity of BRT are needed to promote people to use BRT in the near future.

Meanwhile, this result showed contradictory with the former theories and ideas which discussed that the decision making process in bus rapid transit management is highly political perspective alone, particularly in low and middle - income countries which are locked into car - centric transport system and it now becomes a critical policy and strategy to implement sustainable transportation (Goedeking, 2024). Following that, most developed countries have already certain standards and operational procedures, as the challenges are often in political dynamic, political feedback: backlash (e.g., from users and/or car owners) can lead to operational issues, which can feed more backlash. If left unchecked, such cycles result in perpetual financial instability, loss of political legitimacy, and even closure.

In contrast, the problems of public transportation policy in Indonesia have more complex than just a political aspect alone. The policies which control private vehicles number, such as confinement of vehicle

purchasing, can not be applied properly in Indonesia since it is related to the automotive industry actors and government. Besides, controlling private ridership will harm automotive industries, which will lose their market share in Indonesia. Furthemore, the bureaucratic system prevents the resolution of the problems encountered by private companies because the dominant market player has strong political connections, enabling it to require contracts. As a result, the tendering into a private company lead to many troubles; such as, lack of budget for maintaining the Trans Jakarta facilities, only a few pedestrian revitalization, left lane construction, no bus shelter development, and other facilities. Bottom lines, ever since the tendering process approved, the regulation and supervision on the operational of BRT is not conducted regularly by the local government, thus the service quality still failed to conform to the standards outlined in the expected development path, such as lack of pedestrian path, insufficient information board, shortage of seats in the shelter, and not disability friendly.

The solutions can be applied by the government in the Metropolitan Jakarta to overcome those traffic problems, such as (1) adopt transit oriented development (TOD) and green public transport modes which accessible to all users, (2) build more rapid transit alternatives in the urban fringe areas (3) integrate the intercity and urban public transport system, (4) provide sufficient funds and investment for public transport planning, (5) engage local community participation in public transport planning, and (6) promote safe and secure public transportation in pandemic situations (Covid-19).

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