DOI <https://doi.org/10.18551/rjoas.2020-10.25>

A STRATEGY FOR RESILIENCE PUBLIC TRANSPORTATION DEVELOPMENT IN MALANG CITY

Susanto R.*, Fanani Z., Nuh M., Widagdo S.

University of Brawijaya, Malang, Indonesia

*E-mail: roedysusantoo@gmail.com

ABSTRACT

Transportation is a critical aspect of a city, where poor transportation system management will cause problems such as traffic jam, inefficient and delay on supply and chain, and cost overhead. Malang, a middle size city in Indonesia, is the third most congested city nationally having approximately 56 hours of driving in the traffic jam in 2019. The traffic jam mainly is caused by inconsistent traffic management, inadequate parking regulation, the lack of good public transportation, and the rapid rate of urbanisation specifically by college students. Considering public transport as the primary solution, in this study, we examine factors and strategies to develop resilience and sustainable public transport considering aspects of the limited fund, possibility of conflict, and current strength. We find that revamping the existing public transportation system is the most feasible solution than developing new modes of transportation, such as the MRT and LRT. The finding may be beneficial for the policymaker to provide regulation to develop better public transport.

KEY WORDS

Public transportation, sustainable development, resilient development, Malang City.

Transportation system is the heart of the city, ensuring the people movements, the distribution of resources, and the infrastructure development. In a dense urban city such as Malang, the sustainable transport system is believed to be a solution to accommodate the needs of the city today without sacrificing the future of urban residents in the future. However, the implementation of sustainable transport system from policy into reality is not merely natural; therefore, there are several sectors to be considered, for example, the development of sustainable public transport which can reduce the use of private vehicles (Weiner, 2003).

Based on INRIX publication, Malang was the third most congested city in Indonesia with the driving in traffic for 39.3 hours in 2017 and increased to 56 hours in 2019. As stated by Susanto et al. (2017), the primary factors of traffic jam are urbanization, lack of infrastructure, chaotic parking systems, and unreliable transportation system. These factors interestingly are similar to the factors of severe congestion in densely populated cities in other developing countries, such as Dhaka (Mahmud et al., 2012) and Lagos (Olagunju, 2015).

As a solution to the traffic problem, public transport is considered as the golden answer that ensures sustainable development. However, the development of sophisticated public transport is expensive, and if it is not carefully managed, it will result in horizontal and vertical conflicts. Meanwhile, as a medium-sized city, Malang does not have access to a significant financial amount and must independently seek funding for the development of public transport. Moreover, Muchtari et al. (2001) and Susanto et al. (2017) have indicated the possibility of conflict, where the trigger is economic factors that are considered detrimental to the current transportation business owner and the government.

Therefore, in addition to the sustainability framework, we also pay attention to the resilience framework. Formally, resilience is the ability to balance the system order to normal conditions if there is a disturbance or change to the system (Henry & Ramirez-Marquez, 2012). We believe that by considering the resilience framework, Malang can form a foundation to build a public transportation system independently and can gratify a wide range of transportation system stakeholders. The implementation of the resilience framework,

initially was in ecological studies, then, consistently used in psychology (Dent & Cameron, 2003), economics (Rose, 2007), and engineering (Hollnagel et al., 2006). Regarding resilience research in the field of transportation, a number of studies have been conducted with a focus on various segments of the transportation system such as helicopter transportation (Gomes et al., 2009), land ports (Hosseini & Barker, 2016), and rail transportation networks (Ip & Wang, 2011). Meanwhile, other studies conducted from the perspective of the whole transportation system have also been widely carried out (Chen & Miller-Hooks, 2012; Miller-Hooks et al., 2012; Nair et al., 2010).

Based on the research of Susanto et al. (2017), it states that Malang does not yet have strict regulations regarding the use of private vehicles and does not have a public transportation development plan, so it is natural for traffic to be uncontrolled. Thus, overcoming congestion problems in Malang must include technical problems in planning, implementation and evaluation; and regulatory issues. The handling of traffic problems involves many stakeholders and has the potential to cause conflicts that affect the level of successful implementation. The success of public transportation development also needs to pay attention to privacy concerns and environment conditions (Dano & AlQahtany, 2019).

Therefore, it is necessary to conduct a study within the framework of sustainability and resilience in order to obtain a model that can be used to measure the feasibility of implementing a public transportation system in Malang and anticipate the impacts that may arise. Furthermore, using a qualitative method, we identify the need of different public transport stakeholders and formulate the possible approach for public transport development considering sustainability and resilience framework.

Malang is a middle size city in Indonesia located 445 to 526 above sea level in a mountainous valley in the eastern part of the Java Island. With a land area of 110.06 square kilometres and 927,285 inhabitants in 2019, the population density of Malang is 8425.27 people per kilometre square (BPS-Statistics of Malang Municipality, 2020). As the centre of Malang Regency, which is consequently also the centre of education and industries, during working hours the number of people in Malang can reach more than 1.5 million.

At present, the public transportation system in Malang uses a minibus with a capacity of 13 passengers with a low level of security and comfort. The system established at the early 90s serving 25 routes where the fleets are the same until today. The number of fleets is continuously decreasing wherein 2007 there were 2,758 units but in 2017 only 2,453 units (BPS-Statistics of Malang Municipality, 2017) and in 2019 only 2,131 (BPS-Statistics of Malang Municipality, 2020). The fleets owner is an individual who is generally a driver or who employs several drivers. The government applies the concept of deregulation, thus only controls the number of fleets, routes, and tariffs, but does not guarantee technical matters such as schedules, service availability, and stopping points. Consequently, the current public transport is not ideal for mobilizing city dwellers whose number can reach more than 1.5 million during work hours. Moreover, there is no travel time certainty due to the absence of a fixed time table. The uncertainty is worsening since the fleets will operate when all the seats are fully filled. The service availability is also erratic, especially during the quiet hour of passengers. Hence, public transportation is not the primary choice for travelling triggering the use of private vehicles.

The number of private vehicles in Malang is climbing from 255,485 in 2007 to 594,533 in 2019. The shortage of public transportation is further utilized by online-based transportation which reaches thousands of vehicles in Malang Regency. In contrast to public transport, which has slightly better regulations, online-based transportation does not have access to the station, so they occupy the roadside or keep driving so that overwhelming the road. Instead of becoming a solution, online-based transportation may trigger conflict with the existing public transport fleet owners cause other problems, such as noise and air pollution increase.

Coupling with the high rate of urbanization, the transportation problem in Malang is worsening. The urbanization in Malang primarily is by the development of the industrial sector and education facilities. With the yearly rate of 7.69% from 2001 to 2012, the direct effect is the unbalance conversion of open area to the residential area in a specific location

(Rukmana & Rudiarto, 2016). The massive urbanization, then, is causing an open land conversion. For example, forest coverage has decreased sharply from 64% to 22% between 2001 and 2014 (Ramdani et al., 2015), 1327.61 Ha of agricultural land in Malang and the surrounding area has been utilized for the residential area from the end of 1990s until recently (Adrianto & Ravetz, 2020), and the construction area has increased around 10% each year between 2003 and 2013 (Purwanto et al., 2016). As an illustration, Figure 1 shows the difference in the urbanization pattern in Malang in 2001 and 2014.

Figure 1 – Cartographic map of the urbanization process in Malang, East Java (Ramdani et al., 2015)

MATERIALS AND METHODS OF RESEARCH

This research focuses on transportation problems in Malang, with a research period from November 2019 to February 2020. The approach used in this research is phenomenology and ethnography, where we collect data by observing and interviewing participants to find out the phenomena experienced by individuals and groups, then, we analyzed the empirical conditions regarding the resilience of the transportation system in Malang.

We interviewed ten types of stakeholders including governmental bodies (G1, G2, G3, G4), users (U1, U2), transportation business owners or drivers (O1), transportation organizations (L1), experts (T1), and regulators (E1) (see Table 1.). Our respondents were 21 people, where we asked different questions to be able to find out the latest conditions, the efforts made, the plans, the problem, the policies, the needs and expectations, and the constraints and advances in development. Totally, we prepared nine topic questions as can be seen at table 2. With the question differentiation, we could assure the validity of interview result based on interviewee qualification and expertise. For example, it is more convincing when the questions related to current transportation projects were answered by governmental bodies (G1, G3), while the questions related to the quality of services were answered by users, the fleets owner and drivers, and transportation experts (U1, U2, O1, T1).

Table 1 – The type of public transport stakeholders being interviewed

Type	Code	Description	# of respondent
The Directorate General of Highways	G1	The directorate under the Ministry of Public Works with the main task of compiling the implementation and formulation of regulations related to road management.	1
Office of Public Works, Spatial Planning, Residential Areas, and Housing	G2	The office under the Ministry of Public Works which is in charge of determining and overseeing policies for area planning, development of residential and housing areas.	1
Transportation Agencies, The Ministry of Transportation	G3	The agency under the ministry of transportation with the main task of compiling the implementation and formulation of regulations related to road transportation.	1
The Malang Regional of House of Representatives (Development Commission)	E1	The commission in the Malang Regional of House of Representatives in charge of supervising and participating in planning city development.	4
Road Policing Unit	G4	The police unit with the main task of maintaining the smoothness and safety of roads.	1
Public transport users	U1	Current public transport users which travels daily.	4
Private vehicle users	U2	Current traveler who use their own vehicle for daily activities.	4
The fleet owners or drivers	O1	Current fleet owners or drivers who operate it every day.	2
Urban Planning and Transportation expert	T1	An expert in urban planning and transportation.	2
Land transport organization	L1	A non-profit organization concerning in public transport and fleet owner and drivers welfare.	1

Table 2 – The question topics and the stakeholder targets

Question Topic	Interview Target
Current transportation projects	G1, G3
Transportation development plan	G1, G2, G3, T1
Transportation policy	G1, G3, E1, L1
Public transport problem	G1, G3, E1, G4
Urban and spatial planning	G2, T1
Public transport development difficulties	G1, G3, E1, T1
Public transport development impact	E1, O1, T1, L1
The quality of current public transport services	U1, U2, O1, T1
The expected quality of the future public transport services	U1, U2, O1, T1

The objects of the interview from government bodies were the head of the office or the directorate so that only one person is sufficient. They had very in-depth knowledge regarding the questions because they are the main person in transportation monitoring, development and planning. Likewise, we interviewed the head of a land transport organization as a party who understands the needs of fleet owners and drivers concerning the government as the regulator. The public transportation users were randomly selected but applying the criteria that they should be a daily public transport passenger. At the same time, the experts in transportation and urban planning were researcher and lecturer in a local university. Finally, the private vehicle users consisted of two car users and two motorbike users as we realized that users riding different vehicle types might have a different expectation to public transport.

Interviews were conducted for one to two hours individually except for the members of the regional House of representative. The latter, the format was brainstorming and attended by four members. The results of the interviews were then extracted and compiled to obtain comprehensive facts, information and knowledge. Then we verified and enriched the compilation with statutory, project and planning documents provided by the governmental bodies, land transport organization, and the regional House of Representatives.

RESULTS OF STUDY

We consistently find that all stakeholders want an improvement in the public transport management system in Malang. The improvement aspects are generally the same, although there are slight variations based on individual interests. The most important thing is that the sustainable and resilience development model seems to be mutually agreed.

Current transportation projects. In a short time, transportation infrastructure enhancement is the most feasible solution to overcome the traffic problem. The current enhancement is the facility development and expansion of intersections due to congestion in

Malang always occurs in this area. The problem with intersection repair is that it creates severe congestion for a while and this solution is not a long-term solution. There are 33 intersection points that will be repaired where the Detail Engineering Design (DED) and improvement studies have been made and soon followed by land acquisition.

In some areas, for example, East Malang, many residential centres were built with narrow rural road access and crossing valleys. This area is a new congestion centre because the settlers' workplaces and schools are mostly in the CBD area. In order to solve the daily congestion, several bridges have started to be built even though the costs are relatively high. By 2020, 114 road infrastructure development projects are ready to be executed out of the 126 proposals submitted and are expected to reduce the level of congestion.

Transportation development plan. Until now, the existing transportation system development plan only deals with infrastructure improvements such as road widening and bridge construction. Regarding public transportation, there is a proposal to build an MRT (Mass Rapid Transit) or LRT (Light Rapid Transit) becomes an ideal solution for people mobility and may overcome congestion for a periode between 5 and 20 years. However, the construction of the MRT and LRT will face high costs and technical problems. Limited funds, mountainous topographical contours, and the narrow road in Malang make it less likely for MRT and LRT development. Investors may be reluctant to invest considering the population of Malang is approximately 1 million and around 4 million with the surrounding area.

With minimal costs and without much changing on the existing road facilities, a vehicle with a capacity of 30 passengers is the ideal choice for public transport. As a start, in the near future, school busses will be operated, utilizing existing routes and implementing RASS (Safe and Safe Schools Route). Though the school bus services are not free from risks since it may reduce the existing public transport fleet owners and drivers income. Educating student to not use private vehicles is also another challenge, but an effort can be made with the school busses availability.

Transportation policy. The current congestion problem is mainly caused by the absence of policies to limit the number of private vehicles and to improve public transport services. Transportation problems in Malang City should not only be the responsibility of Malang City Government, but also other directly adjacent regional governments, including Malang Regency and Batu City. Accordingly, it is necessary to form a Transportation Council covering all areas of Malang Raya which will provide a proper narrative, planning, implementation and monitoring of mass transportation. The council may consist of academics, community leaders, legislators, the executive, business owner, and the police, all working together for the common good. The impact, apart from transportation, is in the economic, social and security sectors. It should be emphasized that improving public transport does not necessarily replace the existing system, but on the contrary, it must strengthen the existing system, improve service quality, reduce development risks, and guarantee the income of fleet owners and drivers. To ensure the development process, the stages of public transportation development must be realized in the form of a complete regulation including targets and time of achievement as well as technical definitions.

Public transport problem. Public transportation in Malang City faces problems of safety, comfort, availability, expensive, and uncertainty of travel time. The cause is the uncontrolled urbanization, and the lack of public transportation renewal and quality of service improvements. Financial capability is the most complicated issues. The construction of public transportation projects requires a large amount of money so that only private investors can finance it. Meanwhile, Malang is a medium-sized city with a low level of community income. It is quite challenging to determine the appropriate tariff once the new transportation mode is available; in the end, the Malang government has to provide burdensome subsidies.

The absence of public transportation improvements becomes an opening for the introduction of online-based transportation. By law in Indonesia, online-based transportation is not public transportation because it is not supervised by the Transportation Agency, so that safety and comfort standards can be ensured. Another problem is that the number of online-based vehicles is not known with certainty by the authorities so that it cannot be known whether the number is currently operating or how much is using road facilities. The trend of

online-based transportation may contribute to congestion, high level of pollution, and endanger other road users.

Another effect of a poor transportation system is acute congestion, although the worst points are in the city center and university areas. Utomo & Hariyani (2018) has made a good model of congestion in these areas, where the congestion occurs continuously between 6 am and 8 am. University students are the group with the highest mobility rate and utilizing road with their private vehicles dominating by motor bikes. The frequent mobility rate is costly and time-consuming, and the availability is not certain. Even though the student residence is not too far from the university, walking is not a safe option due to the lack of sidewalks and signs that protect pedestrians.

Urban and spatial planning. Regarding the landscape of Malang, it is indispensable to build a public transportation system that reaches residential enclaves in suburban areas. With regard to urban development, especially to accommodate urbanization, Malang is divided into six zones in the form of a Spatial Planning Detailed Zone Plan. Zone-based division is aimed at regulating the development area so that population distribution and mobilization can be evenly concentrated, reducing the rate of people and goods movement.

Public transport development difficulties. The difficulty of public transport development in Malang mainly is related to the lack of funding and an entirely unregulated system. At present, the financial scheme for the operation of public transport is left to the private sector, and this makes the discourse of replacing unreliable fleets is difficult. The decrease of public transport quality is resulting in the decrease of occupancy and lower-income, so that it is only sufficient for operational costs and cannot be used for vehicle renewal. The City Government is also deemed reluctant to provide subsidies, due to the possibility of limited budget funds.

Furthermore, updating the transportation system can create conflicts with current vehicle owners and drivers. Even though the private sector's income has decreased, some parties still rely on the transportation business as their primary income. In the new system, the government is obliged to include the current transportation business actors and ensure an increase in their income. It is also necessary to encourage private vehicle users to use public transportation. So that apart from fleet improvement, other supporting facilities such as sidewalks, road crossings and bus stops should be provided. It is indeed time to have careful planning on transportation improvement, including the system and managerial of public transport and supporting infrastructures, as well as the inclusion of the existing fleet owners and drivers.

Public transport development impact. A better public transport may be a solution for congestion problem, reduce private vehicle use, and increase people wellbeing. The congestion problem is highly related to the use of private vehicle. The reliable and low-cost public transport possibly can convert private vehicle user resulting in lower number of vehicles utilizing road. Soon, the amount of air pollution will decrease, and the environment quality will improve. The economic sector will get the most benefit since there is no delay on goods and services delivery reducing additional cost cause by traffic. The transportation business will also be more attractive promising higher revenue.

The quality of current public transport services. Most of public transport users argue that the current public transport system is unreliable, high-cost, slow, not safe and uncomfortable. The absence of schedules and lack of passengers has an effect on vehicle availability. Vehicle owners do not want to operate the vehicle when there are few passengers. As a result, passengers are unable to estimate travel times. Existing routes are also not integrated, so that for the same distance the costs may vary depending on the number of vehicles ridden. As a result, the majority of people prefer to use private vehicles. The use of public transportation is more due to compulsion, for example those who do not have private vehicles or cannot drive themselves.

The expected quality of the future public transport services. Public transportation users will benefit if transportation services pay more attention to comfort, safety, punctuality, and low costs. The current fleet is a small vehicle with 11 passengers with no space between each other. A larger vehicle with air conditioner and extra spaces is believed can attract more users. The safety is another concern since the existing fleet is a 1990's vehicle with no safety

support such as fire extinguisher and seat belt. However, the most demanding factors are punctuality and lower cost where currently are not provided. The private vehicle user considers using public transport when these two factors are available. Finally, a complete route coverage and integration are also a major concern guarantying of ease and flexible mobility.

DISCUSSION OF RESULTS

A robust public transportation services will guarantee the better transportation system in general (Mulley et al., 2007). However, developing sustainable and resilient public transportation with limited funds is a difficult task but still possible. To do so, there must be a strong institution that can guarantee legal function, planning, implementation, monitoring and evaluation. The legal guarantee is non-trivial, to make sure that the development design, implementation stages and fair incentives scheme for stakeholder can be achieved accordingly. Based on Buchanan (2003), legal guarantees for the public transport system must cover four aspects, the existence of regional organizations, funding, supporting rules, and coordination of land policy and transportation policy. Actually, regional organizations already exist in Greater Malang, but their function is not optimal, because they work independently and limit themselves to their work areas. Cooperation between organizations across areas is required so that the formation of a transportation council is highly required. In term of funding, there should be commitments from stakeholders both for operational and infrastructure. However, it must be realized that the inclusion of capital for public transportation is not changing the budget from road construction to public transportation. The current supporting rules are only related to tariffs and vehicle replacement plans, not including other aspects such as guarantee of services and safety. The supporting rules in the form of complementary policies will strengthen transportation policies and ensure the achievement of development goal.

It is also possible to adapt other cities public transportation system, however there is no guarantee of successful implementation. Malang City is a unique city, having a different characteristic compared to other Indonesian cities. To get correct development direction, we evaluate the main stakeholder needs, including governmental bodies, current fleet owners and drivers, and public transportation users.

Governmental bodies needs. As the key stakeholders with the biggest role to ensure the sustainability and resilience of the public transportation system, governmental bodies obligation is to protect other stakeholders by introducing work quality and safety standards, controlling the availability of services and controlling prices. In more detail, the activity will include controlling road service licenses, motor vehicle emissions, speed limits, tariff control, vehicle inspection and maintenance procedures. Initially, the governmental bodies is required to provide an integrated development plan so that it can guarantee the fulfillment of public's needs. Then, they can take into account the interests of other stakeholders so that no party feels disadvantaged. Funding commitments, then, should follows by contributing current fleet owners and other private sectors. This whole must be contained in the form of comprehensive regulations covering all aspects of the modern public transportation system that can benefit all stakeholders.

Fleet owner and driver needs. Understanding the fleet owner and driver needs is important to ensure there are no rejection. Therefore, the improved system must guarantee income, job security and business involvement. The new system should ideally be bureaucratically simple and have efficient services.

Public transport user needs. The community in Malang, in general, needs comfortable, on time and predictable, certain, and affordable public transportation. The ability to meet these needs will encourage private vehicle users to take advantage of public transportation. The current public transport tariff is relatively low, however, when the journey has to use more than one route the cost become high. The use of private vehicles such as motorbikes is much cheaper, where the cost of public transportation for one trip can be used for two trips or more of private vehicles.

The current public transportation is not reliable in term of punctuality and predictability. In general, public transport departs from the original terminal to the destination terminal in two patterns, leaving in full or empty passengers. For the first pattern, there is no time limit to wait until the fleet is full. While for the second pattern, the fleet will move slowly and even can stop randomly in any place. This causes the uncertainty of travel time and it is impossible to predict the duration of the trip. At certain hours, public transport decides not to operate because of lack of passengers. It can also be that public transportation does not pass the proper lane to save fuel and avoid traffic or do not want to take passengers to their destination for the same reason.

Transportation system development obstacles. Regarding the transportation issues, Malang have nine problem including rapid population growth, congestion in all existing roads, air pollution parking, stagnant facilities and road area, low coordination between governmental, and limited budget funds.

In Malang, the public transport system is using deregulated approach limiting the role of government. Deregulation is believed can ensure free and healthy competition between public transport providers so as to improve the quality of service. Some opinions on deregulation argue that this exemption will lead to benefits in the areas of cost savings, reduced tariffs, reduced overall public spending, better service levels, greater innovation and greater responsiveness to passenger needs. The rationale for deregulation is also related to the case in some developing countries where regulation is sometimes used by certain groups for personal or group interests, so that the formulation of regulations by the government represents more political interests than the public interest (Cervero, 2000; Estache & De Rus, 2000; Vasconcellos, 2011; World Bank, 1986). However, the deregulation is also neglecting the Sohail (2006) argument that the existence of regulations and mechanisms governing the public transportation system in developing countries has very important values.

In accordance with Sohail (2006), the reality is that in Indonesia, especially in Malang, the absence of regulation has led to uncertainty in public transportation services, such as the absence of a proper schedule, changing prices, reduced reliability, lack of connections between modes of transportation, increased congestion, and bad behavior on the road to win passengers. Hence, it can be concluded that deregulation has a negative effect on the public transportation system, therefore, this is where the role of the government is to make good regulations and then carry out and supervise their implementation consistently.

There are strategic plans identifying the introduction of public transport such as the use of city buses and student buses along with safety guarantee, although the development steps and milestone are not stated. Most public transportation regulations contain procedures and sanctions for fleet owners and drivers but no passenger rights and. For this reason, it is important to make a comprehensive considering all stakeholders.

Congestion has become commonplace in recent years due to the unreliable transportation system. It seems that efforts to improve the quality and size of roads have not been able to accommodate the increased use of private vehicles. The direct result is environmental problems, especially air pollution which causes health problems. Congestion is also influenced by the typical driving habits of motorbike users, which are dominated by young people. Another factor is the lack of pedestrian paths which causes people to prefer using private vehicles rather than walking for safety reasons.

The large number of private vehicles uses is not balanced with adequate parking space. This has led to the use of the side of the road as a parking area, thereby reducing the area of the highway. The parking area along the side of the road is mostly managed illegally. Transportation improvements inevitably will trigger a conflict.

With a good public transport system, current problems will be resolved with minimal conflict. First, good public transportation will reduce the number of private vehicles. This will have a positive impact on environmental problems and reduce the level of community stress due to traffic jams. Second, the reduced number of private vehicles will reduce parking problems.

Parking areas along the shoulder of the road are generally managed by non-governmental parties who control certain areas illegally. With a good public transportation system, current issues will be overcome with a little conflict. First, good public transportation will reduce the number of private vehicles. This will have a positive impact on environmental issues and reduce the level of community stress due to traffic jams. Second, the reduced number of private vehicles will reduce parking problems. The effectiveness of roads will also increase because they are free from illegal parking activities.

Model of Public Transport Development in Malang. Based on the interview results and documents study, we examine the possible public transport development schemes in Malang. We have put aside the possibility of developing mass transportation because it is not financially feasible, even though it is economically feasible because it can solve transportation problems in the long term.

The lowest cost public transport system improvement is to replace an existing fleet with the same type of vehicle. Replacement cost is the responsibility of fleet owners, but the government is obliged to provide subsidies and a profitable financing scheme. Subsidies and financial assistance are important because current fleet owners are individuals who do not have good access to capital. It should also be noted that previously there were regulations regarding fleet replacement, but they failed to be implemented due to funding problems.

However, same type fleet replacement is not the ideal solution, as it does not increase comfort. A medium-sized bus with a capacity of 28 to 40 passengers is a better choice in terms of efficiency and comfort. By using buses, the current number of vehicles is around 2,600 which can be reduced but the transport capacity increases. The impact is a decreased road load, especially when private vehicle users switch to public transportation. Furthermore, service scheduling can be applied, and tariffs are determined based on the length or distance of use which affects service certainty and tariff reduction. Rejection by fleet owners and drivers is likely because their income and jobs are threatened. There must be a commitment to bring them together in private companies with participation as investors or employees. Thus, training must be carried out for fleet owners and drivers to participate in accordance with the needs of the new transportation system. As completeness, supporting infrastructure needs to be prepared which includes bus stops, sidewalks, and payment systems. It would be better if the vehicle uses environmentally friendly electrical energy.

Finally, to integrate Greater Malang including Malang City, Malang Regency and Batu City, the special bus lane that crosses the main city route is a further improvement (busway). Standard or double decker buses can be operated, connecting business points around Malang. For integration, the existence of a transportation council whose working area includes Malang Raya is crucial. Their main task is to ensure the harmony of the interests of stakeholders in different areas by planning, implementing and supervising an integrated public transportation system.

CONCLUSION

With the current transportation system, coupled with the lack of improvement plan, Malang will face severe traffic problems. The poor public transport service is believed as the main cause of the use of private vehicle which leads to the overload road occupancy. Therefore, it is time for the government to make public transportation development policies and implement them consistently. With the consideration of sustainability and resilience, the improvement of public transportation must not be detrimental to current and future stakeholders. With the consideration of sustainability and resilience, improvements to public transport must not harm current and future stakeholders. The limited funds make the most possible improvement is the replacement of the existing fleets with safer and more comfortable vehicles, preferably a larger size vehicle. The development of busway is considerably important when Malang Raya is to be integrated. The participation of current fleet owners and drivers in development plans is imperative to avoid conflict and rejection, where the primary goal is to increase their income.

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