**Strategy Building for Dealing with COVID-19 in Urban Transportation Development in Jakarta**

*Irma wanderi¹, Andri N.R. Mardiah², Suryani Eka Wijaya³*

¹Amcolabora Institute, Jl. Raya Sukabati Kav.58, Sukabati, Cibinong, Bogor
²Indonesian Ministry of National Development Planning, Jakarta/Amcolabora Institute, Jl. Raya Sukabati Kav.58, Sukabati, Cibinong, Bogor
³Bappeda Provinsi Nusa Tenggara Barat

¹ Corresponding Author (e-mail: irmawandari@amcolabora.or.id)

Received: 3 March 2022 / Accepted: 10 March 2022 / Published: April 2022

**Abstract**

One of the impacts affected by the existence of the Large Scale Social Restriction Policy (PSBB) in Jakarta is the urban transportation sector, according to data from ppid.Transjakarta, which states that there has been a decrease in Transjakarta and Jaklingko 2020 users by 33.8% of the data on the number of Transjakarta and Jaklingko users in Jakarta in 2019 for the period of March - July. However, the dependence of urban communities on public transportation in carrying out their activities during the COVID-19 pandemic has the potential for the spread of COVID-19 cases. This article aims to develop a strategy for urban transportation development in the COVID-19 era in Jakarta. Input this research results on internal and external factors in the form of strengths, weaknesses, opportunities, and threats in the development of transportation for the COVID-19 era in Jakarta is based on interviews with key stakeholders using the content analysis method and the second stage is in formulating the right strategy using SWOT analysis. The research results show that six alternative strategies can be applied in the development strategy of urban transportation in the COVID-19 era in Jakarta.

**Keywords:** COVID-19, Urban Transportation, Strategy of Urban Transportation Development

1. Introduction

The city of Wuhan, China reported cases of pneumonia for which the cause was unknown to WHO on December 31, 2019. Nine days later, the Chinese government revealed that it had found the
Sars-Cov-2 virus which caused the COVID-19 disease outbreak in Wuhan City. Following the finding of 125,260 confirmed global cases of COVID-19 worldwide, on March 12 2020, World Health Organization declared that the COVID-19 virus is a category of global pandemic (World Health Organization, 2020). Several other countries have implemented different policies in the spread of the COVID-19 virus. Like the countries Italy, Spain, France, Germany implement strict policies to limit contact between citizens. The South Korean state conducts the mass inspection and a free drive-through system to contain the spread of COVID-19.

The first patient case of COVID-19 in Indonesia was confirmed on March 2, 2020, then until now the number of cases of additional COVID-19 patients has always increased. So that to break the chain of COVID-19 transmission in Jakarta, the Jakarta Government issued a Large-Scale Social Restriction Policy (PSBB). The PSBB policy limits school activities, offices, public facility activities, and the public transportation sector. One of the impacts affected by the existence of PSBB in Jakarta is the public transportation sector, according to data from ppid. Transjakarta, which states that there has been a decrease in Transjakarta and Jaklingko 2020 users by 33.8% from the data on the number of Transjakarta and Jaklingko users in Jakarta in 2019 for the period of March -July however, the dependence of urban communities on public transportation in carrying out their activities during the COVID-19 pandemic has the potential for the spread of COVID-19. Previous studies have stated that the public transportation sector is a vector for the spread of COVID-19 (Buja, A, et al, 2020) and other studies have found a strong correlation between infectious diseases and traffic, especially increased traffic during the disease outbreak and the spread of COVID-19 (Meloni, Sandro, et al., 2009).

Schemes facing the “new normal” era in the transportation sector have been regulated by the government in the Ministry of Transportation Regulation Number. 18 of 2020 concerning Transportation Control in the Context of Preventing the Spread of COVID-19 but the existence of this regulation still focuses on transportation management that prioritizes health protocols and has not been integrated with the concept of developing sustainable and safe transportation from the spread of COVID-19 for the community. The results of the latest research, (Mogaji, Emmanuel, 2020) have formulated a strategy for the transportation sector affected by COVID-19 in Lagos, Nigeria with the Avoid-Shift-Improve (ASI) Framework approach. Avoid-Shift-Improve (ASI) Framework is three main strategies to formulate sustainable transportation and focus more on the transportation demand system (GTZ, 2008). This research discusses the ideas of how to implement policies as a strategic mechanism to develop urban transportation in the COVID-19 era in Jakarta.

1.1. Transportation and COVID-19

On October 16, 2020, WHO reported that more than 38 million had been infected and nearly 1.2 million people worldwide had died due to COVID-19 (WHO, 2020). As a result, all governments around the world have issued policies to slow down and limit the spread of the COVID-19 virus, the concept of "new normal" has also begun to be implemented with measures to limit "social distancing", some countries appear to loosen restrictions on community movement such as reopening shops / businesses, the role of individual transportation choices and travel choices is a major concern in facing the “new normal” era (Budd, 2020).

According to Lyons (2020) existing terms such as “smart” and “intelligent” mobility, tend to increase in technological developments and as solutions in digital transportation policies. Restarting the global economy in the face of the new normal era will require the mobility of people and goods but it has the potential for the spread of the COVID-19 virus, according to (Beirao, Gabriela, JA Sarsfield Cabral, 2007) the increasing use of private vehicles today has implications for congestion and other
pollution, most people now rely heavily on private vehicle travel. This contradicts the policy before COVID-19 which pushed for a mode shift towards sustainable public modes and transportation. Greenpeace in its “Manifesto for a Green Recovery” argues that the government should redesign urban transportation fundamentally by prioritizing walking, cycling in improving public health and reducing air pollution.

In times of COVID-19, a reduction in train capacity could lead to an increase in private transportation. Therefore, it is important to increase the frequency of train provision, to avoid the behavior pattern of traveling from commuters to private cars. In the context of cities facing problems caused by traffic transport, the continuous increase in private cars needs to be avoided. If the mode shifts to preference in private cars, it will interfere with urban transportation systems, besides that it will cause several negative impacts, such as an unsafe environment, both for road users and CO₂ production, congestion in urban areas, and worsening the quality of life of its residents (Tardivo, Alessio, et all, 2020). In research (Tardivo, Alessio, et all, 2020) suggests that there are several steps to adopt the public transportation sector (rail) in Europe for the new challenges of the “new normal” era. The following are steps that need to be taken by the public transportation sector to face the “new normal” era:

1. Resilience
Development of the railway system as a form of adaptation to mobility after COVID-19. The development of the railway system is needed to establish a level of resilience against COVID-19, for example the level of financial resilience, the application of an e-ticket system that is more accelerated.

2. Return
Creating a detailed plan to reverse the economic crisis due to reduction from the transportation sector during COVID-19, indicators that need to be developed include recovery from crisis-induced instability, prevention/recovery measures in the short, medium, and long term in assessing the impact of abatement losses from the transportation sector.

3. Reimagination
There needs to be an adaptation of the public transportation sector in providing services and maintaining competitiveness so that funding for research and development activities is needed. The public transportation sector must become the center of mobility for the movement of the people, accompanied by policies that encourage economic growth and transportation policies that need to be harmonized. Besides, there is a need for policies for environmentally-friendly transportation (walking and cycling) and public transportation.

4. Research
Cooperation between universities and research center needs to be strengthened not only to provide innovative solutions in the transportation sector technology but to increase research competitiveness. Besides, in the face of the “new normal” era, it is necessary to have research in service operations that digitize and prioritize health protocols to minimize the capacity of viral infections on surfaces that are touched by public transport users (doors, chairs, ticket machines, etc.) and air purification through air conditioning which is following the method and design of closed air filters for the prevention of transmission of COVID in the public transportation sector.

1.2 Sustainable Transportation
The transportation system in a sustainable society needs to fulfill the principles of economic, social, and environmental impact. Based on research (Brotodewo, N., 2010) has formulated the concept of sustainable transportation in several metropolitan areas in Indonesia. The following are indicators, definitions, and criteria for sustainable transportation:

| Table 1. indicators, definitions, and criteria of Sustainable transportation |
Indicators of Sustainable Transportation

| Indicators of Sustainable Transportation | Definition                                                                 | Criteria                                                                 |
|-----------------------------------------|---------------------------------------------------------------------------|---------------------------------------------------------------------------|
| Economy                                 | In the economic aspect, sustainable transportation must involve urban economic activities, be easily accessible, and increase the economic growth rate of an urban area. | ● Accessibility  
  ● Supporting urban economic productivity |
| Social                                  | In the social aspect, sustainable transportation can create access to social justice by minimizing the rate of road accidents and creating public awareness in driving. | ● Programs related to sustainable transportation  
  ● Improving safety in transportation |
| Environment                             | In the environmental aspect, sustainable transportation must strive to use environmentally friendly resources. | ● Minimization of environment pollution caused by the transportation sector |

Source: Brotodewo, N (2010)

Bahrends, Sonke, et al. (2008) argue that a sustainable transportation system ensures accessibility for all residents, can reduce the negative impact of the transportation system itself, reduce air pollution and noise, and contribute to improving the quality of the urban environment. Urban traffic causes congestion levels, GHG (Greenhouse Gas) emissions, and other problems, so a new approach is needed to solve transportation problems. According to research (GIZ, Deutsche, 2015) it has formulated a sustainable transportation framework that focuses more on the demand side, which is called the ASI (Avoid-Shift-Improve) Framework. The purpose of the ASI Framework approach is to promote alternative mobility solutions to develop a sustainable transportation system. The ASI Framework approach includes 3 things:

1. Avoid
The concept of "Avoid" is actions that aim to limit travel or avoid travel by motorized vehicles. Through the integration of land-use planning and transportation demand management, it will reduce travel demand.

2. Shift
The concept of "shifts" are actions aimed at increasing travel efficiency. Mode shift from energy-consuming (car) to a more environmentally friendly mode. In general, the alternative mode shift is as follows:
  ● Non-Motorized Transport (NMT): walking and cycling. These two modes represent the most environmentally friendly choice of mode.
Public Transport (PT): buses, trains, etc. Although public transport produces emissions, higher energy consumption per km and occupancy implies that passenger CO2 emissions per km are lower than that of the car.

3. Improve

The concept of "Improve" focuses on vehicles and fuel efficiency (optimization of transportation), this aims to improve the energy efficiency of transportation modes and motor vehicle technology.

![ASI Framework](http://ijddi.net)

Figure 1. ASI Framework  
Source: Deutsche GIZ, 2015

The ASI Framework approach is a comprehensive and coherent framework that contributes to climate change mitigation and adaptation strategies. These strategies are as follows:

- Mitigation: Enables decision-makers to develop transportation strategies that support climate change mitigation by increasing the efficiency of the transportation system.
- Adaptation: Help define the pathway in formulating a more resilient transport system and contribute to effective disaster risk management.

**Improved transportation mode services**

The purpose of public transportation services is to provide comfortable services to the community in their mobility activities. According to the UK Department for Transport and UK's Passenger, 4 indicators are needed in carrying out transportation services, namely:

1. Accessibility, related to the location of the stop mode, the quality of the transportation infrastructure
2. Affordability, relating to fare setting and providing subsidies for public transportation passengers
3. Availability, associated with scheduling departure times and modes of transportation
4. Acceptability, related to information services and attitude drivers

Besides according to (Joewono Tri Basuki, Hasashi Kubota, 2007), there are 9 factors and attributes in service mode, namely: availability, accessibility, reliability, information, customer service, comfort, safety and security, fare, and environmental impact.

2. Method

This research uses a qualitative methodology for answering the research questions of how to formulate the urban transportation development strategy in the midst of the COVID-19 era in Jakarta. Several methods and analysis techniques were used in the research stage. The first stage is to use content analysis techniques to identify problems and challenges in urban transportation in Jakarta in the era of
COVID-19. Content analysis is a research method using a set of procedures to make valid conclusions from the text (Ahmad, Jumal, 2018). At this stage of content analysis, in-depth interviews were carried out with key stakeholders to find out the characteristics, opportunities, and challenges in the development of urban transportation era COVID-19 in Jakarta. The second stage of the study used the SWOT analysis method in formulating urban transportation development strategies in the COVID-19 era. The SWOT framework (Strengths, Weakness, Opportunities, and Threats) is proposed by many people as an analytical tool to categorize environmental factors in the form of internal factors (strengths and weaknesses) and external factors (opportunities and threats) (Pickton, David W, and Sheila Wright, 1998). The SWOT matrix can be used as a strategy determination with the possibility of several strategic alternatives (Rangkuti, 2006). The following is the distribution of the SWOT strategic alternative probability matrix:

3. Results and Discussion

3.1. Results

On May 4, 2020, the Jakarta Government issued a Large-Scale Social Restriction Policy (PSBB) as an effort to break the chain of the spread of COVID-19 in Jakarta. One of the sectors affected by the PSBB policy in the city of Jakarta is the public transportation sector. The public transportation sector is quite depressed due to restrictions on community mobility, based on data obtained from the ppid. Transjakarta.co.id. There is a decline in the trend of public transportation use (Transjakarta and Jaklingko) in the period March-August in 2019 and 2020.
Based on the figure 2, there was a decrease in the number of Transjakarta-Jaklingko passengers for the period March-August 2019 and 2020 by 33.8%, this is because the largest decrease occurred in May 2020 because the Jakarta government implemented the PSBB Total policy for the first time in the Jakarta area. The limitation of public transportation fleets causes disruption of community mobility in fulfilling their activities, this is due to preventing clusters of COVID-19 cases in the public transportation sector. The following is data on the number of COVID-19 positive patients in Jakarta during March-August 2020:

![The Number of COVID-19 positive patients in Jakarta](http://www.corona.jakarta.go.id)

Up to six months since the global COVID-19 pandemic in Indonesia, the graph of the number of positive patients in Jakarta has not shown a decline, so in this case special handling is needed for the government and society to reduce the number of positive patients with COVID-19. The Indonesian government has issued Minister of Transportation Regulation Number 18 of 2020 concerning Transportation Control in the Context of Preventing the Spread of COVID-19 as an effort to face the "new normal" era. This regulation still focuses on transportation management that prioritizes health protocols, the existence of this regulation is also one of the first steps in realizing a strategy for developing safe transportation from COVID-19.

### 3.2. Discussion

**Analysis of Internal and External Factors for Urban Transportation Development in COVID-19 pandemic era in Jakarta**

Analysis of internal and external factors in the development of transportation in the COVID-19 era in Jakarta using the Content Analysis method. The content analysis was carried out by asking the opinions of key stakeholders regarding the characteristics, opportunities, and threats in the development of the COVID-19 era transportation in Jakarta. The criteria for in-depth interview respondents are having influence and interest in the development of urban transportation in Jakarta, so that the key respondents in this study were the Jakarta Transportation Council (DTKJ) Development and Research Commission. Content analysis was carried out with the help of codes (colors) for each variable and code alphabet for key respondents. The following is the distribution of color codes and letter codes in content analysis:

| Color | Variable | Indicator | Alphabet |
|-------|----------|-----------|----------|

![Table 2. Distribution of color and alphabet codes for key stakeholders](http://ijddi.net)
Internal factors in this analysis include strengths and weaknesses in the development of urban transportation in the COVID-19 era in Jakarta, while external factors are threats and opportunities in the development of urban transportation in the COVID-19 era in the city of Jakarta. Strengths, weaknesses, opportunities, and threats are determined by calculating the coding of key stakeholders. The following is the result of coding the characteristics of urban transportation in the COVID-19 era in Jakarta:

Table 3. The result of coding the characteristics of urban transportation during the COVID-19 era in Jakarta

| Color | Variable | Transcript Quotes | Code | Keyword confirmation | Conclusion | Transcripts quotes Frequency |
|-------|----------|-------------------|------|----------------------|------------|-------------------------------|
| Blue  | Mode stop location (A1) | “It’s not that the bus stops are being reduced but the route services are decreasing” | DT.C1.1;DT.C1.2; DT.C1.5; DT.C1.12; DT.C1.13; DT.C1.14 | Route Service | The number of operations of several fleets was reduced | 6 |
| Public transport integration | “the problem is making reintegration, some of it has been taken by the Jakarta government” | DT.V1.4, DT.V1.5 | Integration | There is not yet optimal mode of integration in Jakarta City | 2 |
|-----------------------------|-------------------------------------------------------------------------------------------------|------------------|-------------|-------------------------------------------------------------|----|
| Information service         | “What if we separate the traffic for those coming from the edge of Jakarta then shop at Tanah Abang for other traffic needs” | DT.D1.3; DT.D1.4 | Traffic     | Traffic is too heavy for station.                           | 2 |
| Current regulation at the point of transit | "He said that one thing that must be broken down is in places where the activities are very intense, the stations are very large, | DT.W1.1; DT.W1.2; DT.W1.4; DT.W1.5; DT.W1.9; DT.W1.11 | crowd       | Crowds at several points of the station                     | 6 |
| Category | Details |
|----------|---------|
| Fares    | "So DTKJ provides input if there is a fare increase and yesterday there was a plan to increase the fare next year." |
| Subsidy  | "Those who are joined in Jaklingko are guaranteed, they are paid km/passenger." |

| Fare       | DT.B1.1; DT.B1.2; DT.B1.3 |
|------------|-----------------------------|
| Subsidy    | DT.B2.4; DT.B2.5; DT.B2.6   |

| Fare       | There are fare increases for several land modes in Jakarta |
|------------|-----------------------------------------------------------|
| Subsidy    | Not all fleet crews and persons with disabilities have received subsidies / assistance from the |
|            |                                                           |
“Yes, for bus stops, the station is quite good in terms of the covid protocol, for example providing a hand sanitizer, distance signs, but not all passengers are obedient."

Network

“...because the network is still incomplete and maybe the maturity of the citizens are not yet equipped with health protocols..."

Network

"It is still difficult to realize because the network is not yet optimal in Jakarta..."

Network

"...the cyclist network design in the Jakarta is not yet optimal..."

Network

"...supporting infrastructure is..."
| Transport related policies | Technology innovations that are safe from COVID-19 and affordable for the public | Transporting bicycles is still lacking |
|----------------------------|---------------------------------------------------------------------------------|---------------------------------------|
| The first technology we can think of can DT Y1.1, DT Y1.2, DT Y1.3, DT Y1.4, DT Y1.5, DT Y1.6 maintain cleanliness and is visible enough for the economy and finance. | Technology |
| Transport development plans | "There is already a policy to encourage mode shifting, such as going viral using bicycles served by the DKI government and assisted by *Polda Metro Jaya*" | DT.Y2.1; DT.Y2.2; DT.Y2.7; DT.Y2.8; DT.Y2.9 | Policy plan | There is a design development plan for a more environmentally friendly transportation | 5 |
| Social protection policy | "We don't have anything about social protection for people who affected by Covid, especially for crew members who do not belong to *Jaklingko*" | DT.Y3.3; DT.Y3.5; DT.Y3.6; DT.Y3.9 | Social protection | There is no social protection for the crew yet | 3 |

Table 3 shows the result of content analysis from key stakeholders regarding the characteristics, opportunities, and threats of urban transportation development in the COVID-19 era in Jakarta. It helps to identify internal and external problems in the development of urban transportation in the COVID-19 era in Jakarta. Emerging issues are mode of integration, passenger flow regulation, and policies and programs related to transportation. The next step is to identify internal and external factors to be analyzed in the EFAS IFAS analysis, so it is necessary to classify them into factors that adequately...
represent the answer ideas on elements SWOT. Here are the results of grouping Strength, Weakness, Opportunities, and Threat:

Table 4. IFAS and EFAS factors in the development of urban transportation in the COVID-19 era in the city of Jakarta

| SWOT | Idea factors from key respondent | Factor |
|------|----------------------------------|--------|
| **IFAS** | **Strengths** | |
| | The availability of government assistance for crew members who joined *Jaklingko* during the COVID-19 period | Government assistance for fleet crews during the COVID-19 period (S1) |
| | Transportation in Jakarta is quite complete | Completeness of transportation modes in Jakarta (S2) |
| | The method of paying fares for transportation is modern | Payment of transportation rates is modern (S3) |
| | **Weakness** | |
| | Crowds at several station points | Traffic that is too busy at several points of the station (W1) |
| | Too heavy traffic at some station points | |
| | The operating schedules of several fleets were reduced | The operating schedule of several fleets is reduced (W2) |
| | The number of train trips is not optimal | |
| | Reduced route services outside the main corridor in Jakarta | |
| | Not all bus fleets are covered by BUMD Jakarta | Not all public transportation is covered by the Jakarta Transportation Agency (W3) |
| | Not all of the transportation in the city of Jakarta is covered by the Transportation Agency | |
| There is no social security for small bus crews who have not joined the BUMD | Not all crew members of the fleet have received assistance from the Jakarta Government (W4) |
|---|---|
| Not yet optimal mode integration in the city of Jakarta | The modal integration in the city of Jakarta is not yet fully optimal (W5) |
| The difficulty of managing cards for persons with disabilities in the city of Jakarta during COVID-19 | Not all fleets in Jakarta are friendly to persons with disabilities during COVID-19 (W6) |
| Several modes of transportation in the city of Jakarta are not friendly to persons with disabilities | The unavailability of safe cyclist and pedestrian networks in Jakarta (W7) |
| The network for cyclists is incomplete | EFAS |

**Opportunities**

| Technological innovations that are safe from COVID-19 and affordable for the public | A technological innovation that is safe from COVID-19 and affordable to the public (O1) |
|---|---|
| The government has subsidized the transportation that has joined with Jaklingko | Subsidies for transportation incorporated under the auspices of the Jakarta Government (O2) |
| There are fares increases for several land fleet vehicles in Jakarta | Plans for increasing fares for some public transport to support facilities for passengers (O3) |
| There is already a policy of using bicycles for transportation in urban areas | There are policies that encourage the use of bicycles in urban transportation (O4) |
| There are already plans in the development of designs for cyclists and pedestrians in Jakarta | There are plans to develop paths for cyclists and pedestrians in Jakarta(O5) |
Threats

| Factor                                                                 | Weight | Relative | Rating | Score |
|-----------------------------------------------------------------------|--------|----------|--------|-------|
| There is no clear policy on dealing with COVID-19 in Indonesia        | 1      | 018      | 4      | 0,72  |
| Limitation of activities in the transportation sector                 | 1,5    | 0,27     | 4      | 1,09  |
| The tendency of people to use private rather than public transportation| 3      | 0,54     | 3      | 1,63  |
| Organizations for bicycle groups in Jakarta City do not have a structured organization |        |          |        |       |
| Seizure of the fat route by several transportation companies in the city of Jakarta |        |          |        |       |
| Many cyclists do not understand the rules of cycling                   | 3      | 0,54     | 3      | 1,63  |

In the table of identified internal and external factors, the next step is to determine the weight, relative, rating, and score of each identified factor. The weight, relative, and score were calculated based on a questionnaire that was filled in by the stakeholders. The following are the results of the weight, relative, rating, and score of the identified internal and external factors:

Table 5. Results of the IFAS and EFAS questionnaires
| Weakness                                                                 | Value 1 | Value 2 | Value 3 | Value 4 |
|--------------------------------------------------------------------------|---------|---------|---------|---------|
| Traffic that is too busy at several points of the station               | 1,16    | 0,09    | -4      | -0,37   |
| The operating schedule of several fleets is reduced                     | 1,4     | 0,11    | -4      | -0,44   |
| Not all public transportation is covered by the Jakarta Transportation Agency | 1,75   | 0,14    | -4      | -0,56   |
| Not all crew members of the fleet have received assistance from the Jakarta Government | 1,95   | 0,15    | -4      | -0,62   |
| The modal integration in the city of Jakarta is not yet fully optimal    | 2,08    | 0,16    | -4      | -0,67   |
| Not all fleets in Jakarta are friendly to persons with disabilities during COVID-19 | 1,56   | 0,12    | -3      | -0,37   |
| The unavailability of safe cyclist and pedestrian networks in Jakarta  | 2,53    | 0,20    | -3      | -0,60   |
| Total                                                                   |         |         |         | -3,67   |
| Opportunities                                                            |         |         |         |         |
| A technological innovation that is safe from COVID-19 and affordable to the public | 0,83   | 0,12    | 3       | 0,37    |
| Subsidies for transportation incorporated under the auspices of the Jakarta Government | 2      | 0,29    | 4       | 1,19    |
| Plans for increasing fares for some public transport to support facilities for passengers | 1,66   | 0,24    | 3       | 0,74    |
There are policies that encourage the use of bicycles in urban transportation 1,11 0,16 3 0,49
There are plans to develop paths for cyclists and pedestrians in Jakarta 1,09 0,16 3 0,48

**Total** 3,29

### Threats

| Threat                                                                 | Strength | Weakness | Opportunity | Challenge | Result |
|-----------------------------------------------------------------------|----------|----------|-------------|-----------|--------|
| There is no definite policy in dealing with COVID-19 in Indonesia, especially in the transportation sector | 1,91     | 0,14     | -4          | -0,56     |
| Some communities during COVID-19 tend to switch to private vehicles   | 1,41     | 0,1      | -3          | -0,31     |
| Not yet accommodated cycling communities in Jakarta                   | 1,975    | 0,14     | -3          | -0,43     |
| There is competition from several fleet companies in taking the busy route in Jakarta | 3,26     | 0,24     | -3          | -0,72     |
| Not all cyclists understand the rules of cycling on the road          | 5        | 0,36     | -3          | -1,1      |

**Total** -3,14

In the table of the results of the internal and external factors obtained above, the position coordinates of the position can be determined. The location of the coordinates in the quadrant serves to determine which strategy is most appropriate in efforts to develop urban transportation in the COVID-19 era in Jakarta that is most appropriate to current conditions. The determination of the coordinate results is as follows:

1. Location of coordinates $x = \text{Total score of strengths} + \text{Total score of weaknesses}$
   
   $x = 3.45 + (-3.67) = -0.21$

2. The location of the $y$ coordinate $= \text{Total opportunity score} + \text{Total challenge score}$
   
   $y = 3.29 + (-3.14) = 0.15$
Based on the results of the calculation of the position of the SWOT strategy coordinates, the coordinates are located in the third quadrant, namely the stability strategy, this strategy is also known as the WO strategy. This strategy quadrant focuses on eliminating existing weaknesses and creating new opportunities (Wang, Kuang Chen, 2007). This strategy has internal weaknesses but can be overcome by increasing the opportunities that exist in the development of urban transportation in the COVID-19 era in Jakarta.

### 3.3. Analysis of the Strategy for the Development of Safe Urban Transportation in the era of COVID-19 in Jakarta

This research uses a SWOT matrix to elaborate internal and external factors that have been collected from key stakeholders. This matrix is based on strengths, weaknesses, opportunities, and threats that are important to formulate urban transportation development strategy for the COVID-19 era in Jakarta.

Table 6. SWOT Matrix for Strategy Urban Transportation Development in COVID-19 pandemic era in Jakarta
| IFAS | **Opportunities:** | **Threats:** |
|------|-------------------|--------------|
|      | 1. A technological innovation that is safe from COVID-19 and affordable to the public (O1) | 1. There is no definite policy in dealing with COVID-19 in Indonesia, especially in the transportation sector (T1) |
|      | 2. Subsidies for transportation incorporated under the auspices of the Jakarta Government (O2) | 2. Some communities during COVID-19 tend to switch to private vehicles (T2) |
|      | 3. Plans for increasing fares for some public transport to support facilities for passengers (O3) | 3. Not yet accommodated cycling communities in Jakarta (T3) |
|      | 4. There are policies that encourage the use of bicycles in urban transportation (O4) | 4. There is competition from several fleet companies in taking the busy route in Jakarta (T4) |
|      | 5. There are plans to develop paths for cyclists and pedestrians in Jakarta (O5) | 5. Not all cyclists understand the rules of cycling on the road (T5) |
| Strengths: | 1. Express subsidies or assistance to transportation crews who are not yet under the auspices of the Jakarta Transportation Agency (S1, O2) | 1. Conducting education to the public about safe cycling procedures on the road (S2, T3, T5) |
| --- | --- | --- |
| | 2. Completeness of transportation modes in Jakarta (S2) | 2. Budgeting assistance for bicycle community activists as pioneers in society to continue using environmentally friendly vehicles (S1, T2, T3) |
| | 3. Payment of transportation rates is modern (S3) | 3. Cooperate and coordinate with public transport companies that have not been incorporated under the auspices of the Jakarta Government in terms of route distribution in Jakarta City (S1, T4) |
| 1. There is government assistance for fleet crews during the COVID-19 period (S1) | 2. Applying appropriate technology innovations that are safe from COVID-19 on public transportation and easily accessible to the public (S2, S3 O1) | 4. Encourage the community to be active in using environmentally friendly modes of transportation by providing safe and comfortable cycling paths for the community as an alternative mode of transportation in urban areas (S2, O4, O5) |
| 2. Completeness of transportation modes in Jakarta (S2) | 3. Improve the service of public transportation facilities in Jakarta with an increase in fleet sales (S2, O3) | 4. Conducting educatio
n to the public about safe cycling procedures on the road (S2, T3, T5) |
| 3. Payment of transportation rates is modern (S3) | 4. Encourage the community to be active in using environmentally friendly modes of transportation by providing safe and comfortable cycling paths for the community as an alternative mode of transportation in urban areas (S2, O4, O5) | 2. Budgeting assistance for bicycle community activists as pioneers in society to continue using environmentally friendly vehicles (S1, T2, T3) |
| 1. There is government assistance for fleet crews during the COVID-19 period (S1) | 2. Completeness of transportation modes in Jakarta (S2) | 3. Cooperate and coordinate with public transport companies that have not been incorporated under the auspices of the Jakarta Government in terms of route distribution in Jakarta City (S1, T4) |
**Weaknesses**

1. Traffic that is too busy at several points of the station (W1)
2. The operating schedule of several fleets is reduced (W2)
3. Not all public transportation is covered by the Jakarta Transportation Agency (W3)
4. Not all crew members of the fleet have received assistance from the Jakarta Government (W4)
5. The modal integration in the city of Jakarta is not yet fully optimal (W5)
6. Not all fleets in Jakarta are friendly to persons with disabilities during COVID-19 (W6)
7. The unavailability of safe cyclist and pedestrian networks in Jakarta (W7)

**Proposed Solutions**

1. Adding to the ground fleet operation schedule during the COVID-19 era (W1, W2, O3)
2. Improve transportation facilities that are safe and clean during the COVID-19 era which are affordable for the public (W2, O2)
3. Integrate several urban transportation modes with cycling and pedestrian lanes (W5, O4)
4. Providing networks for cyclists and pedestrians on several roads in Jakarta (W7, O5)
5. Improve transportation mode facilities during COVID-19, especially to be friendly to people with disabilities in Jakarta (W6, O2, O3)
6. Budgeting, cooperating, and coordinate with transportation companies that have not been incorporated under the auspices of the Jakarta Government in terms of improving transportation mode facilities in the city of Jakarta (W3, W4, O2)
7. Manage passenger traffic in the transportation sector during the COVID-19 era (W1, W2, T1)
8. Integrate transportation modes in the city of Jakarta and cooperate with fleet companies outside the auspices of the Jakarta Government in taking busy routes in the city of Jakarta (W4, W5, T4)
9. Integrate modes, cooperate and coordinate with transportation companies in Jakarta in providing transportation facilities that are disability-friendly during the COVID-19 era (W6, T2)
10. Educate the public to continue using public transportation during the COVID-19 era by developing technology (W7, T2, T5)
Based on the SWOT matrix strategy above, 6 alternatives can be applied in the efforts to develop urban transportation development strategies for the COVID-19 era in Jakarta. The most suitable strategy to be applied is the W-O strategy, which this result is obtained from the mapping of the SWOT matrix coordinates.

4. Conclusion

Based on the analysis that has been carried out, the following conclusions are drawn in the efforts to develop urban transportation development strategies for the COVID-19 era in Jakarta:

1. Adding to the ground fleet operation schedule during the COVID-19 era
2. Improve transportation facilities that are safe and clean during the COVID-19 era and which are affordable for the public
3. Integrate several urban transportation modes with cycling and pedestrian lanes
4. Providing networks for cyclists and pedestrians on several roads in Jakarta
5. Improve transportation mode facilities during COVID-19, especially to be friendly to people with disabilities in Jakarta
6. Budgeting, cooperating, and coordinating with transportation companies that have not been incorporated under the auspices of the Jakarta Government in terms of improving transportation mode facilities in the city of Jakarta

The strategy taken is the W-O strategy. The W-O strategy is based on the strategy which is located in quadrant III. This strategy has internal weaknesses but can be overcome by increasing the opportunities that exist in the development of urban transportation in the COVID-19 era in Jakarta.

References

Ahmad, Jumal. (2018). Content analysis Research Design (Content Analysis).
Bahrends, Sonke, et al. (2008). The Impact of Urban Freight Transport: A Definition of Sustainability from an Actor's Perspective. Transportation Planning and Technology, pp.693-713.
Behrends, S, et al. (2008). The Impact of Urban Freight Transport: A Definition of Sustainability from an Actor's Perspective. Transportation Planning and Technology, pp.693-713.
Beirao, Gabriela, J.A. Sarsfield Cabral. (2007). Understanding Attitudes Towards Public Transport and Private Car: A Qualitative Study. Transport Policy, pp.478-489.
Brotodewo, N. (2010). Assessment of Sustainable Transportation Indicators in the Metropolitan Area in Indonesia. Jurnal Perencanaan Wilayah dan Kota, Vol. 21, No.3, pp.165-182.
Budd, L. S. (2020). Responsible Transport: A post-COVID agenda for transport policy. Elsevier, pp.1-5.
Buja, A, et all. (2020). Demographic and socio-economic factors, and healthcare resource indicators associated with the spread of COVID-19 in Northern Italy: an ecological study. MedRxiv, pp.1-27.
GIZ, Deutsche. (2015). Sustainable Urban Transport : Avoid-Shift-Improve (A-S-I). German: Federal Ministry for Economic Cooperation and Development.
GTZ. (2008). Transport and Climate Change (Sustainable Transport: A Guide for Policy Makers in Developing Cities). Jerman: Deutsche Gesellschaft fur Technische Zusammenarbeit (GTZ).
Joewono Tri Basuki, Hasashi Kubota. (2007). The Multigroup Analysis Regarding User
Perception of Paratransit Service . Proceedings of the Eastern Asia Society for Transportation Studies, pp.1-13.

Lyons, G. (2020). Walking as a service- does it have legs? Transportation research interdisciplinary perspective, pp.271-284.

Minister of Transportation Regulation Number. 18 of 2020 Concerning Control of Transportation in the Context of Preventing the Spread of COVID-19

Meloni, Sandro, et all. (2009). Traffic-driven Epidemic Spreading in Finite-size Scale-Free Networks. National Academy of Science, pp.1-9.

Mogaji, Emmanuel. (2020). Impact of COVID-19 on Transportation in Lagos, Nigeria. Transportation Research Interdisciplinary Perspectives, pp.1-7.

Transjakarta and Jaklingko (2020). Statistics Data Center of PT Transjakarta. Available online: www.ppid.transjakarta.co.id [October 12, 2020]

Pickton, David W, and Sheila Wright. (1998). What's SWOT in Strategic Analysis? Strategic Change.

Rungkuti, Freddy. 2017. SWOT Analysis Technique of Dissecting Business Cases. Jakarta: PT Gramedia Pustaka Utama.

Tardivo, Alessio, et all. (2020, April 27). COVID-19 Impact in Transport, An Essay From The Railway's System Research Perspective. European Rail Research Network of Excellence (EURNEX), pp. 1-16.

Wang, Kuang Chen. (2007). A Process View of SWOT Analysis. Business Administration National Taipei University, pp.1-12.

World Health Organization. (2020). Coronavirus Disease 2019 (COVID-19) Situation Report-52. World Health Organization (WHO).

© 2022 by the authors. Submitted for possible open access publication under the terms and conditions of the Creative Commons Attribution (CC-BY) license (http://creativecommons.org/licenses/by/4.0/).