

# Impact of COVID-19 and City Resilience Policies on Urban Transportation Study in Jakarta, Indonesia

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## ABSTRACT

This paper aims to analyze the urban governance and health protocol during COVID-19, which has since changed drastically. Therefore, the government needs to choose the right policies to overcome the resilience of cities to respond to COVID-19. This study looks at how Jakarta, as the city with the highest number of COVID-19 in Indonesia, manages the city's resilience through a policy of restricting public transportation with the aim of adaptation. This research is approached using qualitative methods, using qualitative data analysis tools to explore policies taken by the government. The results of this study shows that, in order to maintain the resilience of the city, the Jakarta government imposed a policy of social restrictions on public transportation by limiting service hours, service routes, and the number of passengers, but these restrictions were not accompanied by the community's desire of to maintain the city's resilience during the COVID-19 pandemic. The community struggled to maintain the health protocol, which influences Jakarta's resiliency.

**Keywords:** City Resilience, Covid19, Urban Planning, Public Policy.

## 1. INTRODUCTION

The recent pandemic has changed urban transportation a lot while highlighting the weaknesses of this mode of transportation. Several studies highlight the positive correlation between transport-related exposures and increased risk of disease and premature death [1], [2]. Transportation services have the most significant potential risk of transmitting infectious diseases in shared modes of travel, such as air travel and mass transit, because of the fact that individuals are nearby in a confined environment [3]–[5]. Currently, avoidance of public transport is consistently found across countries, so the challenge for public transportation services is to plan to overcome urban public health problems and not harm community resilience strategies.

The world's cities are currently undergoing

policy changes to increase cities' resilience, to reduce impacts on public health and the economy through better preparedness and response plans [6]. Countries are transforming to design more sustainable, accessible, and resilient urban mobility plans. Changes in the design of transportation plans encourage policies to deal with stress factors and react, by updating and innovating cities in the COVID-19 era [7]. In the most straightforward distillation, 'engineering' resilience (and most of the 'catastrophic' resilience) speaks to the elastic and reversible capacity of a system to return to a pre-stimulus level of operational performance, which can ultimately lead to adaptive outcomes [8], [9]. Engineering resilience is descriptive and may be easy to design and observe in various engineering systems, including various systems and infrastructure sectors [10].

Information about how the disease spreads across and within transportation systems (e.g., nodes, hubs, links, vehicles, carriers, passengers, and users) [11] and understanding of risk, risk tolerance, and risk management [12]–[14] are significant points for strategic and operational planning. Capabilities used within events such as hazardous material releases (National Academies of Sciences, Engineering, and Medicine 2011), communicable disease outbreaks in transit systems [15], air travel [16], or management of transport agents during emergency situations (Krechmer et al. 2018) rely on many of the same systems, frameworks, protocols, operational procedures, and processes required for the COVID-19 pandemic. However, there are still unique challenges presented by COVID-19.

Therefore, it is evident that the impact of COVID-19 on urban resilience can only be managed through early preparedness and rapid city management. Some examples are effective and comprehensive policy management, interim policy interventions, and immediate responses to protect public health, essential services, and community needs and welfare [17]. Social media strategy as a response to the COVID-19 pandemic, a campaign directed towards public transport users in Jakarta so that they are aware of their surrounding conditions and provide mental assistance, is vital in preventing further spread of the pandemic. In this study, we look at the response of the DKI Jakarta Provincial government related to transportation governance in the COVID-19 era.

This research is important because Jakarta is the province with the highest confirmed cases in Indonesia, but the Jakarta Government continues to allow transportation services to run. DKI Jakarta government's policy of providing operational permits for public transportation services can create clusters of transmission and further spread of the virus in DKI Jakarta, despite increasing the use of public transportation services. Therefore, it is necessary to look at the strategy of the DKI Jakarta Government in creating transportation management in the era of this pandemic. In short, urban resilience is directly related to public health and public welfare issues, both of which are important at any scale.

## 2. BASIC THEORY

### 2.1 Urban Resilience Transportation Design

Urban resilience highlights the management of the city's ability to respond to shocks in a better direction, achievable through many approaches [19]. Urban resilience planning is achieved through adapting activities in accordance to the conditions faced. Therefore, this study briefly reflects some of the early lessons for improving urban resilience during COVID-19 and primarily aims to discuss the importance of preparedness to further increase the effectiveness and success rate of our response [17]. A good response can be in the form of a policy to prepare for future conditions, related to the challenge of an unexpected spike in virus transmission. Better preparedness can guide future urban transformation ([20] [21])

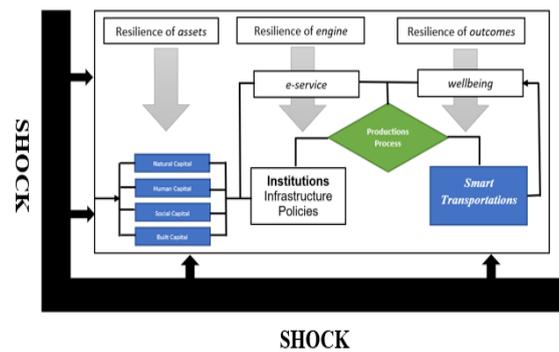


Figure 1. Theoretical Framework

In general, population movement and transport infrastructure, which enhance inter-and intra-urban connectivity, are considered key factors contributing to infectious diseases. Their role in previous disease outbreaks (e.g., Ebola) had been documented [22]. Other modeling studies confirmed the importance of mobility patterns/restrictions for pandemic spread/containment [23]. Therefore, to contain the spread of COVID-19, many local governments had implemented partial or complete restrictions on mobility (Carteni et al., 2020; Ai et al., 2020). Empirical evidence shows a significant reduction in social mobility after the prevalence of COVID-19 and the adoption of travel restrictions. For example, [24] reported an 80% drop in daily travel after restrictions were imposed in the UK. Similar findings had been reported in other contexts. For example, an overall decline of 76% was reported in the city of Santander, Spain [25].

**3. METHOD**

This study used Qualitative Data Analysis (QDA) with the help of a tool: Nvivo 12 Plus [26]. Presentation of data in this study used Nvivo 12 Plus, which is divided into several stages of data processing: (1) creation of a new project, (2) document preparation, (3) data coding, (4) analysis [27], and (5) comparison (Woolf & Silver, 2018). To answer the challenges of transportation governance design in DKI Jakarta, this research collected several government transportation policy documents in the era of the pandemic (2020-2021). The source of this research's data was the official website of the DKI Jakarta Government, in the section on managing legal products based on time series.

**4. FINDINGS AND DISCUSSION**

Jakarta has the highest cases COVID-19 spread in Indonesia. There were several national policies that had become references for the DKI Jakarta Government, including the Periodic Social Restrictions (PSBB), Implementation of Community Activity Restrictions (PPKM), budget recovering (APBD), and public transportation permit services. The policy was carried out as a form of response by the DKI Jakarta Government in anticipating and preparing for the pandemic. In the public transportation service sector, the DKI Jakarta Government did not stop public transportation operations at the start of the pandemic outbreak, so that in May 2020, there was a spike in positive cases and deaths per day. One of the problems was, no restrictions on public transportation. Thus, the DKI Jakarta Government, in the past year, had implemented various policy strategies to create adaptive public transportation services in the fight against COVID-19. There were 12 regulations related to transportation transition guidelines in the pandemic era, which started from the types of regional regulations, governors, and up to technical regulations at the level of the implementing unit (UPT Dinas).

**Table 1. DKI Jakarta Transportation Management Policy during the pandemic**

TYPE OF REGULATION	TYPE OF REGULATION
Regional Regulations	1
Governor's Regulation	3
Governor's Instructions	1

Governor's Decree	4
Head of Service Decrees	3

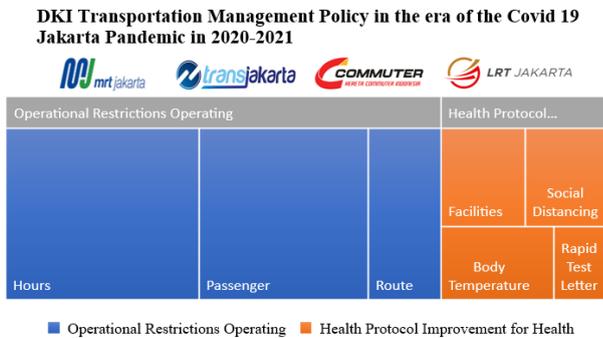
The Jakarta Government's response in the transportation sector was the most numerous at the Governor's Instruction level regulation, with a total of four regulations, then at the Governor's Regulation level and the Head of Service Decree Regulation. The design of DKI Jakarta's transportation management in the COVID-19 pandemic era is an integrated urban governance strategy that involves a long-term vision, pre-event planning, adequate investment in the primary health care system, early warning, and coordination of activities of various sectors and stakeholders are more conducive for timely, and effective response mechanisms to pandemics and disease outbreaks [28], [29]. The public transportation policy strategy had changed, starting with limiting service operations and increasing health protocols for passengers to reduce the spread of the virus in public transportation services. Integrated urban governance had enabled some cities to successfully prevent the spread of the virus by detecting infected individuals quickly through increased testing and better surveillance, as well as timely lockdown and social distancing measures [28] [30]. Such actions often involve providing economic and social support [31].

**Table 2. Planning Urban Transportation in the Pandemic era**

Transportation and urban design	Transportation	Increased transport connectivity is a risk factor that may contribute to the spread of infectious diseases.	Innovative mobility restrictions, based on the transmission risk of different transportation modes, are essential for containing the spread of the virus.
		Public transportation may increase the risk of transmission during pandemics.	More attention to minimizing potential public health risks of public transportation is needed.
		The pandemic may increase negative attitudes towards public transportation	Modal shift to cycling and walking offers a unique opportunity to promote active transportation further

Based on the issues present on the regulations/regulations of public transportation policies in Jakarta, there are developmental issues and solutions in giving trust to the public regarding

transportation services. In general, long-term vision and appropriate plans for mitigation, absorption, recovery, and adaptation are the key factors that determine the resilience of cities to any disruptive events, including pandemics [32]. Public transportation in Jakarta as a whole would be affected more by the governance in the era of the COVID-19 pandemic (for example, MRT, LRT, KRL, and TransJakarta). The impact of COVID-19 on city development in DKI Jakarta can put pressure on designing city transportation resilience. Thus, the policies carried out can test intelligent solutions to solve major social problems [33]. This also provides additional momentum for innovative city development, as evidenced by the speed of adaptation and responsiveness to the COVID-19 virus pandemic and increasing innovative city movement [34].



**Figure 2. Transportation management of DKI Jakarta**

Transportation management design solutions in DKI Jakarta during the pandemic era focused on Operational Restrictions, Operating, and improving Health Protocols. In particular, the regulations issued regulate those related to governance. In addition, the results of the regulatory analysis showed that the role of Operational Restrictions is the primary strategy of the DKI Jakarta Government in responding to COVID-19 in the transportation sector. Operational restrictions on public transportation were focused on three aspects, Operational Hours, Passengers, and Routes. The success of the restriction strategy in public transport travel in restraining the spread of the virus [24], [35], [36], is a solution for countries/cities that have a high percentage of the COVID-19 outbreak. The operational restrictions on public transportation in DKI Jakarta were carried out with consideration that the demand for transportation services in the city is very high, so the DKI Jakarta Government must

ensure the technical management of its implementation.

## 5. CONCLUSIONS

Based on the analysis above, the research concludes that to build city resilience in COVID-19 era, policies directed towards resilience efforts are needed so that the government can map out the potential that will occur in the future during COVID-19. The government's social restriction policies and restrictions on public transportation operations carried out by the government impact service hours, the number of transportation users, and the number of service routes. However, these efforts were not accompanied by the COVID-19 protocol on public transportation. Therefore resilience in the COVID-19 condition was influenced by the community's desire to implement the COVID-19 protocol.

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