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RECLAIMING THE STREET FOR PEDESTRIANS AS A SUSTAINABLE CITY APPROACH

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ABSTRACT

Sustainable infrastructure has become a new trend that is encouraged in cities around the world. With the increasing population growth of large cities, such as Jakarta, the land use structure has been changing. The traffic management initiated by the provincial government, what we call "traffic evaporation," is an attempt to reduce the congestion in Tanah Abang and polluted air from the predominance of cars in streets. Jatibaru Street has become a meeting space for diverse actors/users, including pedestrians from/to Tanah Abang Transit Station, hawkers, and microbuses (*mikrolet)*. The traffic management approach used in Jatibaru can give insight into promoting the street as a public space to fulfil the vision of a livable city and future sustainability in Jakarta. The movement of goods, people, and vehicles gives meaning and purpose to the street as a space of cooperation between users. The aim of this paper is investigating the user response after the "traffic evaporation" approach was implemented and considering traffic management in Tanah Abang by observing the mapping of movement and spatial pattern of users. The focus of observation comprises pedestrians, mikrolet, hawkers. Through spatial ethnography, an emic approach, and space-time mapping, this study considers spatial user practices related to the meaning and function of space in Jatibaru Street.

Keywords: Pedestrian; Public Space; Street; Sustainable infrastructure

1. INTRODUCTION

The challenges every city is dealing with, including developing cities, comprise increased traffic, climate change, and environmental issues, as well as maintaining services and economic matters in transport infrastructure. The main problems associated with increased traffic and congestion have a negative effect on the quality of life of urban citizens (Wallström, 2007). The dominance of motorized vehicles on the roads and urban streets has multiple effects on the environment, such as global warming, health problems, building decay, and urban noise pollution (Wallström, 2007). Due to the dominance of cars and the car-oriented lifestyle, land-use planning cannot cope with the automobile demand for road space (Peterson & Schafer, 2004). Increasing car use can transform the urban landscape into a wasteland, and car traffic can lead to deteriorated living conditions, such as by making households dependent on private cars for daily mobility (Peterson & Schafer, 2004).

Increasing levels of greenhouse gas emissions have become a global concern, and sustainable transport strategies are needed to overcome this urban problem (Wallström, 2007). European citizens identify this environmental concern and car traffic problem as a priority they need to

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address to counteract its negative impact on their quality of life (Wallström, 2007). Traffic and mobility management initiatives are related to infrastructure and land use in an urban area. Considering road conditions, some cities still have enough space to change and add non-car modes of transport (e.g., pedestrianized streets; Wallström, 2007). Urban planners can promote and offer public transport, walking, and cycling as the central modes of transportation for use by citizens. However, a challenge is evident in non-European cities, especially Southeast Asian cities that have high populations and car ownership, where road conditions are already congested.

Taking road space from private cars to provide more space for more sustainable modes of transport on a permanent or temporary basis is the only way to resolve road congestion (Wallström, 2007). This condition is what we call "traffic evaporation." However, the public assumes that traffic congestion will worsen if road capacity is reduced (Wallström, 2007). After the approach implemented in the long term, it proves through traffic measurement and observation result that the traffic evaporation successfully can decreasing the traffic congestion (Wallström, 2007). Traffic evaporation is a sustainable approach where road space is reduced for private cars (Cairns, 1998; Hass Klau, 1998; Goodwin, 1998 in Wallström, 2007). This approach changes drivers' behavior; in the short term, it makes drivers search for alternative routes and driving times, and in the medium term, it causes drivers to engage in more varied and flexible trip planning and change the mode of transport to public transportation; finally, in the longer term, drivers will switch the locations of activities, including the home location or workplace (Cairns, 1998; Hass Klau, 1998; Goodwin, 1998 in Wallström, 2007). Changing mobility to non-car transportation, such as walking and cycling, will make it possible to maintain a satisfactory level of urban quality (Peterson & Schafer, 2004).

Another sustainable approach, the Road Diet strategy, is also a means of traffic calming by reallocating vehicle lanes for many uses, including accommodating pedestrians. Traffic calming is one of five infrastructure factors for cycle ability (Shay et al., 2003 in Sumabrata et al., 2015). It can reduce the traffic volume along the already congested roads (US Department of Transportation, 2015). Traffic calming increases the share of walking and cycling and supports the ecological quality of urban green spaces along roads (Peterson & Schafer, 2004). Traffic congestion concerns municipal citizens' safety and quality of life, and measures to counteract such congestion have been implemented in American and European cities. However, can the approach implemented in Asian cities where its history and circumstances different from non-Asian cities get the same benefits to decrease congestion? Understanding public space use and occupied by Jakarta citizen whom there is overlapped and varied uses of its public space. Public space is not used only for one actors or urgency but with multiple actors moving in space at one time. For instance, there are street vendors selling their goods along the sidewalks, streets, and public spaces to provide their life along with citizen need to get affordable and cheaper foods while walking to go to work. That is going to be new understanding to reconsider the presence of multiple actors in relation to the everyday practices of citizens occupy and live in city to get more sustainability in city planning.

It is vital to implement sustainable infrastructure for regulating the movement of local goods and services between local citizens, enabling economic development and as an act of making the environment better by improving pollution prevention and reducing carbon emissions (Montgomery, 2015). Sustainable infrastructure results in good environmental, social, and health and safety parameters in citizens' lives. It can reduce the consumption of resources, creating indirect benefits by providing new forms of infrastructure that allow users to live more resource-efficient lifestyles (Egler & Frazao, 2016). For example, street use can be changed to make pedestrian-only streets that were used for private vehicles before. This will affect the

environment by reducing pollution and emissions, which can affect communities and their residents' quality of life (Egler & Frazao, 2016). When discussing sustainable urban infrastructure, public transportation networks need to be considered.

Sustainable infrastructure and vibrant, healthy communities can be created by using and planning the development of the land. Presenting a model of new development based on mixed use, transit use, and pedestrian spaces, one of the principle processes is offering a variety of transportation choices. This means that people should be convinced not to use their cars to reduce congestion traffic on streets and roads, while at the same time increasing the mix of automobile infrastructure, rapid transit, bicycle lanes, and pedestrian friendliness, which can increase the efficiency of travel described at https://www.crcresearch.org/sustainable-infrastructure/land-use-planning by the Canada Research Chair in Sustainable Community Development research program at Royal Roads University. The land use of transport in developing cities shows high densities and a variety of functions (Peterson & Schafer, 2004). Transport solutions must be adapted to local conditions because people have different cultures and needs in different contexts.

There are basic principles of integrated land use and transport planning that should be maintained. These involve providing public transport as part of development, implementing parking policies and traffic restrictions, ensuring safe conditions for pedestrians and cyclists and safe routes for children walking by, designing and implementing a public transport strategy, introducing transport planning for traffic management by urban authorities, locating new development near existing local high-capacity transit routes and terminals, and finally, locating new developments near existing highway facilities and ensuring the design and traffic management does not interfere with non-motorized travel and impinge on housing areas (Peterson & Schafer, 2004). These principles will provide for walking, cycling, and citizens' access to public transport (Peterson & Schafer, 2004).

The Jakarta megacity, as one of the cities in the Global South, is characterized by the presence of street vendors or hawkers in the street and cityscape. Thus, Jakarta's citizens use the streets in different ways than they do in other cities, especially Jatibaru Street, Tanah Abang. This has become a meeting space for multiple users and objects, including pedestrians, hawkers, automobiles, and goods. Despite its benefit for the movement of people and goods, the street is used as a roadway for automobile movement. Due to their fossil fuel consumption and pollution creation, automobile use in the roadway increases environmental damage. Thus, like other infrastructure, including roads, bridges, tunnels, and the water supply, the street plays an essential function and has positive and negative effects on the environment (Egler & Frazao, 2016).

Streets are the essential element of the urban infrastructure, and they are designed to carry vehicular and pedestrian traffic, transport merchandise, and provide public spaces for social interaction (Papayanis & Wakeman, 2001). Streets have an essential accessibility function, allowing city dwellers to go to work, the market, and their homes (Papayanis & Wakeman, 2001). Sustainable infrastructure is essential in planning the city and fulfilling the street's function, as there are citizens dwelling in the street most of the time. However, nowadays, the street only accommodates vehicle and automobile circulation. In addition, urban intellectuals see the movement and presence of people in the street who circulate freely and interact with each other as a mark of city health (Papayanis & Wakeman, 2001). Like the concept of bikeability (Sumabrata et al., 2015), walking modes can accommodate multiple purposes, including leisure, recreation, exercise, commuting, and shopping (Saelens et al., 2003 in Sumabrata et al., 2015).

Despite its advantages, walking has been ignored by experts and transport planners. Most transport planners focus on cars, highways, and large-scale transit systems. Walking lacks the funding support provided for the other human-powered modes of transportation (Komanoff & Roelofs, 1993). However, walking adds little or no congestion, unlike vehicle use, which overtakes the roadway capacity and causes constant congestion (Komanoff & Roelofs, 1993). Moreover, walking supports the economic and social vitality of cities by enabling public transport for travelling medium to far distances (Komanoff & Roelofs, 1993). By the environmental benefit of walking include preventing noise, speed, and dangerous conditions on roadways, which often related to motor vehicle use in urban areas (Komanoff & Roelofs, 1993).

In this study, the scope of observation begins with the northernmost part of Jatibaru Street, marked by installation of a portal in front of the east side of the street and opening the median lane (used for mobilization of the TransJakarta feeder bus) in the west lane. It ends with the southernmost part of Jatibaru Street, marked by installation of a portal for preventing private cars and mikrolet from moving via Jatibaru Street, at the intersection between KS Tubun Street and KB Jati Street.

Figure 1 Observation context (Source: OpenStreetMap, 2018)

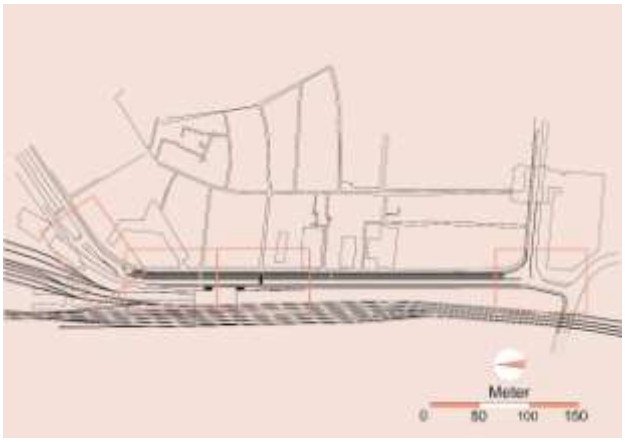

Figure 2 Land and mapping computer-aided design (CAD) file (Source: Jakarta Government)

2. METHODS

The applied method is spatial ethnography, using an emic approach and space-time mapping. Meanwhile, the descriptive method is employed by reading articles, journals, and books. There are four observation points studied, namely the west side, east side, east lane, and west lane of Jatibaru Street. The observation was conducted over 12 hours on site on workdays and

weekend days. The results of the observation are visualized in spatial diagrams with a span of 3 hours each.

The spatial ethnography method reveals urban citizens' behavior and regular spatial practices on site, and it does not depend on assumptions (Kim, 2015). This method merges social knowledge and real physical data, which is essential in a field like urban planning to reveal how space is genuinely used and the meaning behind the existence of that space for people (Kim, 2015). The spatial ethnography method is using for understanding everyday urbanism, which is an approach to planning a city occurring as a critique of postmodern urbanism (Kim, 2015). The everyday urbanism concept involves looking back at what happened, removing the common and regular ideology and professionals' assumptions, including those of urban planners, architects, and academics, who explain the types of intervention employed in urban spaces via the spatial ethnography approach (Kim, 2015).

Spending considerable time on site, talking to people in the space, and participating in people's spatial practices can allow the researcher to see new opportunities, ultimately helping find the relevant solution (Kim, 2015). To understand what is observed, a combination between spatial analysis and ethnography using visualization is necessary (Kim, 2015). We can visualize the results of what is observed in space-time mapping and photography tools to take pictures and assemble them as layered analysis mapping, thereby giving a spatial understanding of the phenomena or variables. The images can give materiality and situated understandings of people's spatial practices in the physical context when carrying out ethnography (Duneier, 1999 in Kim, 2015). By using the methods that have been stated, we can establish a hypothesis about Jatibaru Street as a public space where multiple users conduct their everyday practice. After discussion of the results, we may describe the possibilities from the traffic evaporation approach for urban citizens, especially users who pass along Jatibaru Street every day.

3. RESULTS AND DISCUSSION

Jatibaru Street is located between Tanah Abang Station (west side of the street) and Tanah Abang Market region (east side of the street). This street is part of the Tanah Abang region, Kampung Bali, Central Jakarta, the Special Capital Region of Jakarta (DKI Jakarta). Jatibaru Street is next to Tanah Abang Station, the busiest station in Jakarta.

Figure 3 Result of mapping the movement and spatial pattern of users in first point observation (Source: Field report, May 2018)

A thousand people use the commuter line transportation every day, creating congested conditions in Jatibaru Street and sidewalks, which become a pedestrian movement space, and transaction activities between street vendors selling food and bottled drinks with the pedestrians.

Before the Regulation of the Governor of DKI Jakarta Province Number 17 (2018), Jatibaru Street was dominated by vehicles and other modes of transportation (*mikrolet, becak*), and it came to only allow automobile movements. However, because Jatibaru Street is located between Tanah Abang Station and Tanah Abang Market, there is a high flow of pedestrian movements and sellers. The flow of pedestrian movement gives opportunities for street vendors who are selling small snacks and bottled drinks in front of the south exit station gate and along the sidewalks to sell their wares. This provides a general explanation of the defining congestion and "messiness" in Jatibaru Street.

Figure 4 Result of mapping the movement and spatial pattern of users in second point observation (Source: Field report, May 2018).

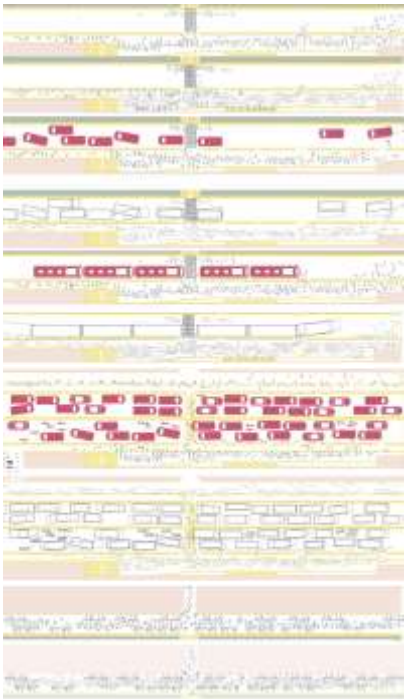

Figure 5 Result of mapping the movement and spatial pattern of users in third point observation (Source: Field report, May 2018)

Figure 6 Result of mapping the movement and spatial pattern of users in fourth point observation (Source: Field report, May 2018)

The first and fourth points of observation are seen in the street as the meeting point between pedestrians, *mikrolet*, and private cars that drop off and pick up their passengers. The high occupation by automobiles in the street often creates difficulties for pedestrians trying to cross the street, even at zebra crossings. The increasing number of pedestrians exiting the station creates congestion and traffic on the street. The second and third points represent the crowded space along Jatibaru Street. However, it should be noted that the number of pedestrians moving around the third point is greater than that for the second point. This is because of the pedestrians shopping on the east side of Jatibaru Street, where Tanah Abang Market is located, and walking to the station simultaneously with the pedestrians coming out of the south exit station gate. This congestion condition becomes a challenge and opportunity for another group of users, namely street vendors selling diverse products and plastic goods, light meals, and drinks along Jatibaru Street and its sidewalks. The sidewalks become the circulation space for pedestrian movements and working space for street vendors or hawkers. The sidewalks are occupied by street vendors, and the high pedestrian movement means the sidewalk space cannot meet both user groups' needs, as the pedestrians spread into the street space. This movement pattern generates conflicts with automobile users, as the drivers' movements make the street unsafe for pedestrians. Because of the motorized traffic in Jatibaru Street, there is frequent congestion, and public transport services *(mikrolet*) are often delayed. The condition of the street in the middle Tanah Abang Market and station are considered unacceptable regarding safety, the environment, and the air quality of urban living.

Jatibaru Street in Tanah Abang is an example, like those in other Asian cities, where we can reconsider the public space paradigms in terms of how the public space is used on the background of the increasing density and heterogeneity of Jakarta's urban life. As a result of the observation and mapping of movement and spatial pattern of users, Jatibaru Street becomes a public space with flexible and adaptive characteristics and small and temporary use by diverse users. Jatibaru Street and the sidewalk on the east and west side of the street are negotiated between users, showing that the sustainability of everyday practice of urban people can be a new consideration in fulfilling a sustainable and better quality of urban life.

The traffic evaporation was implemented in the Tanah Abang region in the end of 2017 until July 2018. The approach begins from 8 AM until 6 PM located in Jatibaru Street. The planning

elements involved closing one side of Jatibaru Street in front of south exit gate of Tanah Abang Station, which is used as the location for street vendors selling their goods. After the governor's regulation, the mobility of people and goods was changed when the TransJakarta Explorer bus was added as public transportation moving in the west lane of Jatibaru Street. New facilities, namely tents that can be dismantled, were added for hawkers who were selling clothes and textile goods in the east lane of Jatibaru Street. Meanwhile, another lane of Jatibaru Street was marked to be a TransJakarta Explorer bus route; this would be free for the pedestrians who wanted to go to Tanah Abang Market and its surroundings.

Land use planning near in Jatibaru Street, mainly at Tanah Abang Station, was affected by 'traffic evaporation' when Jatibaru Street was closed off from automobile movement. In the northernmost part of Jatibaru Street, an underpass bridge was built, and the southernmost side of the street was planned as a motorcycle parking area. Here, motorcycle drivers can leave their vehicles and walk to the east side of Jatibaru Street and east sidewalk to go shopping. This means that the planning influences the visitor's behavior (pedestrian and automobile users) by allowing safe walking and promoting a vibrant street life in the middle of congested urban life. The Jatibaru streetscape is free of car movement and reflects pedestrian-friendliness, as walkability design as one of the characteristics of sustainable cities. Walking is a non-fuel-consuming, non-polluting form of transportation (Komanoff & Roelofs, 1993). By walking, people can develop a sense of place, and having people and services close together increases livability and walkability in the city environment. The parking areas in the northernmost and southernmost parts of Jatibaru Street ensures optimal accessibility to Tanah Abang Market destination and an encouragement for city communities to walk as a healthy habit and use public transport as a great urban lifestyle.

An alternative mode of transport, namely the TransJakarta Explorer bus, with its reduced speed limits, has been offered to pedestrian users from Tanah Abang Station as part of the 'traffic evaporation' strategy for those who want to reach Tanah Abang blocks A and B and access the KB Tubun Street and Fachroudin Street. The circulation of the TransJakarta Explorer bus does not bother pedestrian and shopper movement walking on the west side of Jatibaru Street. The number of TransJakarta Explorer bus departures for the routes is sufficient and shows better public transport service quality to the pedestrian. At peak hours the increasing amount of pedestrian movement intervened with TransJakarta bus lane creates the bus movement stagnant.

The private cars and *mikrolet* as public transportation are only accessed under the flyover on KS Tubun Raya Street. The patrol authority, *Satpol PP*, watches the area and keeps it free from parked cars as part of the traffic regulation. Those elements of the mobility plan make the environment for shopping better, as no cars can bother pedestrians or shoppers who are walking to the street vendors' tents. The road space reallocation should be seen as an integrated approach. This means that, if taking space away from private cars and *mikrolet*, the government and authority should provide public transportation as part of improving the mobility options the city citizens can take and improving the sidewalks' condition to provide comfortable and safe walking for pedestrians. This upgraded cityscape can hopefully improve the quality of urban life for all city citizens. However, there is still a need to communicate with the public on the part of urban planners nd government authorities about the planning to manage traffic, given the great potential benefits of a non-car-dominated urban environment and positive feedback, for the next planning strategy implementation.

4. CONCLUSION

The Tanah Abang region is known as one of the most crowded places in Jakarta, with the focal point of Jatibaru Street because it is the meeting space between the high pedestrian population, congestion from automobile mobility, and hawkers selling their goods in front of and along the west side of sidewalk (alongside Tanah Abang Station). Traffic evaporation and road diet have been adopted as city planning approaches for dealing with the congestion and traffic. Jatibaru Street is located between Tanah Abang Station (one of the busiest stations in Jakarta) and Tanah Abang Market (the biggest wholesale market in Southeast Asia). The traffic arrangement has been regulated in the Tanah Abang area by closing part of Jatibaru Street to enhance the movement of people and services on this street.

The contestation of uses and changes were proposed on Jatibaru Street for the east side of the street in the morning, as this is used by hawkers selling their goods then become walking lane only. The authority sought to tidy up the hawkers' tents and move their selling goods from the east sidewalk to the east side of Jatibaru Street. Thus, the east side of the street is used for selling goods and the movements of pedestrians, who previously walked on both sides of Jatibaru Street. The change in how Jatibaru Street is used as a street space is not limited to one function but incorporates multiple uses due to its adjacency to Tanah Abang Market and Tanah Abang Station.

As shown in this analysis, the meaning and use of Jatibaru Street have changed temporarily at the four observation points. The "messiness" was not apparent, and different users were able to access the same space. This was because of the fluidity of the pedestrian movement flow at the same time as street vendors move around from one side to another and sell goods, as well as the conversion of one of the sides of Jatibaru Street as public transportation movement with a reduced speed limit. The diversity and complexity of the streetscape and appearance of Jatibaru Street give a better quality of walking for pedestrians, as well as a vibrant atmosphere with street vendor stalls negotiating space among the pedestrian movement.

For improving accessibility for people in this public space, there is a need to restrict the access for cars to the street. Regarding the context of Jatibaru Street, it is located between Tanah Abang Station and the Tanah Abang Market; thus, this approach can help pedestrians to walk freely without being bothered by automobiles. This is accomplished by encouraging public awareness and behavioral changes by using the modes of public transportation and walking as the plan to reduce traffic congestion in the road, especially adjacent to the station and market. The traffic management approach used in Jatibaru can be an insight into promoting streets as a public space for fulfilling livability and sustainability while reducing congestion in Jakarta and having a positive effect on the environment.

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