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Towards Safe Cities & Resilient Communities

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PEDESTRIAN AND ITS SAFETY IN HISTORICAL AREA OF BANDA ACEH: AN OBSERVATION

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Abstract **-** As one of the heritage cities in Indonesia, Banda Aceh must pay attention to the historical area in order to maintain the region's historical values as mandated in the "Program Penataan dan Pelestarian Kota Pusaka (P3KP)". Maintaining the preservation of the area is not only done by preserving its cultural heritage, but also by maintaining the stability of its area, such as maintaining the existence of the region by creating an area for pedestrians to enjoy the historical area. The pedestrian infrastructure facilities need to be properly provided in accordance with the applicable rules, so that a vibrant envinroment of walking surrounding historical area can be created. This paper analysed the existing condition in Banda Aceh historical area. An observation was conducted in pedestrians sidewalk around the historical area by observing the design and safety aspects. Based on the field observations, not all pedestrian way designs have complied with the design aspects and criteria for pedestrian. Likewise with safety, some primary roads are not equipped with crossing zones, and existed crossing zones do not seem to use traffic signal. Several suggestions to impose traffic policy in this area such as using traffic calming by limiting the speed of vehicles in primary road in this area and limiting vehicle parking in public space area by allocating street parking in the nearby area.
Keywords **-** Heritage city, Walkable, Banda Aceh

1 INTRODUCTION

After 813 years of existence, many things have happened to the city of Banda Aceh. The length of time has created various faces for Banda Aceh along with the history of Colonialism that left behind historical and cultural designs until the 2004 Tsunami that had changed the topography of Banda Aceh. These changes have shaped an image which some still preserve today as an old town with historical values of the past.

Banda Aceh has officially been declared as one of the 10 pilot projects of the heritage city in 2012 through the "Program Penataan dan Pelestarian Kota Pusaka (P3KP)". The inauguration was conducted with consideration of historical value content in the Old Town area of Banda Aceh, starting from Peunayong, Baiturrahman Great Mosque, Taman Sari to Museum Aceh. These areas certainly have its own charm as a tourist attraction of the old town of Banda Aceh. With the condition of the areas that still has its cultural values and history, a concept of providing facilities for pedestrians takes precedence over the provision of facilities for motorized vehicles in the heritage area. The aim is to provide an opportunity to gain a better exploration experience in the area with a slower mobilization method, which is by foot.

> "Pedestrians are a part of every roadway environment, and attention should be paid to their presence in rural as well as urban areas. The urban pedestrian, being far more prevalent, more often influences roadway design features than the rural pedestrian does. Because of the demands of vehicular traffic in congested areas, it is often very difficult to make adequate provisions for pedestrians. Yet provisions should be made, because pedestrians are the lifeblood of our urban areas, especially in the downtown and other retail areas"
> (AASHTO, 2011)

Walking is popular across ages and for all socioeconomic status; it is free and accessible to most people and can be incorporated into everyday life (McCue, 2017). In developed countries,

walking is one of the aspects that has been the focus in recent years in order to achieve sustainable mobility. Walking is the most basic and natural way to move that every human being possessed. Walking itself able to provide many benefits for the environment, the city, and the people themselves (ex: less pollution, fuel consumption and health issues). Unfortunately in developing countries, walking and pedestrian facilities rarely receive special attention. As stated by ABW (2014) that conventional planning tends to overlook many of these benefits and so it undervalues walkability improvements resulting in underinvestment in this mode: although walking typically serves 10-20% of total trips in economically developed countries, and even more in developing countries, it typically receives just 24% of total public expenditures on transportation facilities and services. This occurs because conventional transport planning is biased in various ways that favor faster modes and longer trips over slower modes and local trips (DeRobertis et al., 2014), thus making a perspective that walking is inefficient and does not require special attention.

This is also the case in Banda Aceh, in addition to trying to provide quality public transport, increasing the volume of roads is still one of the governments focus in solving transportation problems (For example congestion). Development that focuses on the improvement of motorized vehicle facilities leads to the dominance of motorized vehicle use and the lack of attention towards the improvement of facilities and infrastructure for pedestrians (including the streets in the old town of Banda Aceh), thus creating conditions that are less comfortable for people to walk. On the other hand, the new public transport scheme (Trans Koetaradja that operated since May 2016), which would be launched in July 2018 only serve for 3 corridors. They are still unable to cover the mobility demand for Banda Aceh citizens and to reduce the use of private vehicle and it is still not a choice to switch mode from private vehicle (except for captive choice). Another contributing factor to pedestrians is geometrical design that should provide comfort and safety while walking. The existing condition at several parts of historical area show there are improper design of pedestrians, lack of safety and comfort, and inadequate facilities, such as no separation between pedestrian lane and trees (pedestrians way were built in the middle of trees area), the height of pedestrian curb side, pedestrian material in damaged condition, lack of safety guidance in walking and crossing, unavailability of amenities in the pedestrian area, and poor access to vulnerable groups.

In order to present a better experience of old town exploration, the government should be able to provide a good and adequate pedestrian area for visitors, synergizing between designs that support ongoing activities and binding policies, accompanied by strict law enforcement in the process of providing pedestrian facilities and the use of motorized vehicles in the old town of Banda Aceh so that the main aspects in the provision of pedestrian areas that are safe and comfortable can be achieved.

According to Alfonzo (2005), there are five-part models of hierarchy of walking needs: Feasibility, Accessibility, Safety, Comfort and Pleasurability. Southworth (2005) suggests (six) criteria for the design of a successful walking environment: Connectivity, linkage with other modes, fine-grained land-use patterns, safety, path quality, and path context. Meanwhile, Guide to Pedestrian Best Practice (Wisconsin Department of Transportation, 2011), mentioned 2 (two) elements of safety should be concerned: traffic-related safety and personal security. Both have a significant effect in willingness to walk. Traffic security involves pedestrian security protection from traffic, the availability of sidewalks, and security to cross crowded streets. Fulfillment of traffic security needs can be achieved through the provision of accessible pedestrian areas, ensuring safe pedestrian crossings, and the addition of signs, while personal safety tends to be more difficult to be observed and predicted because of its subjective nature. However, personal safety is often associated with the number of other pedestrians in the same area. The street with higher activities intensity is usually more interesting to walk in.

So, in order to give a feeling of personal safety, the provision of lighting and mixed land use that can increase the number of activities should be considered to increase the number of pedestrians. Comfort also plays an important role in increasing the desire of walking, including aesthetic aspects and adaptation to weather conditions. This is done to ensure the availability of suitable conditions for walking. In Wisconsin, walking trip can be more appealing when interesting cultural or natural features visually enhance it (Wisconsin Department of Transportation, 2011).

The smallest detail (such as shoplots display) can have a huge effect on providing a comfortable space for walking. Factors such as the availability of benches, applying some attractive displays on the roadside, and providing a canopy of nearby buildings or utilizing trees can be used as a protection from weather conditions that reduce walking comfort.

In addition to the condition of the pedestrian area, the surrounding environmental image also influences the people's perspective on the suitability of walking in certain areas. There are several things besides providing pedestrian areas that can support the willingness to walk. The first is a motorized vehicle limitation. This limitation can increase the sense of security to pedestrians because of less threat coming from traffic.

Next is to use a mixed method that can draw a lot of activities in the area; as a result, cities were created to bring things together (Speck, 2012). When an area facilitates a lot of activities, it means that there will a be an increase in the number of daily visitor, which makes the area more crowded. This may affect the perspective on walking. A walkable environment is often attractive because it is lively and sociable (Forsyth, 2015). So with the increased intensity of activity, the willingness to walk will increase.

Another thing that affects is the overall design of the area as suggested by Speck (2012) . Designs involve geometric, topology, walking distance, amenities, vegetation, and more. Topology deals with accessibility and convenience. Flat topology will be easier for pedestrians as it is facilitated with good sidewalks. The distance between land use or park or place to take a break for a brief moment also needs to be considered. One of the disadvantages of walking is the small coverage of people's ability to travel. Therefore, walking activities should be supported by the provision of benches, small parks and close land use. Provision of amenities can also affect the sense of security, comfort as well as aesthetic elements. In addition, the provision benches as mentioned before can increase the distance traveled by foot. Furthermore, the provision of appropriate signs can provide a sense of security and become a medium of information for the area. Then the provision of shade vegetation can be a protector and also contribute aesthetic value for the area itself.

Thus, with the provision of appropriate designs, good policy enforcement, and government consistency, it can create a pedestrian-friendly old town in Banda Aceh and provide good exploration opportunities. The attraction to walk is also expected to attract domestic and foreign tourists to visit the old town of Banda Aceh.

2 LITERATURE REVIEW OF PEDESTRIAN FACILITIES

In general, walkable cities have similar pedestrian facilities and policy characteristics. The commonly used approaches are pedestrian protection enhancement, design adjustments to attract interest, provision of supporting amenities, and the establishment of policies that support pedestrians. The protection for pedestrians can be improved by ensuring the safety when traveling on foot. The security improvement can be done by increasing accessibility, the provision of guaranteed security when crossing, and other supporting amenities. There have been range of publications on pedestrian streets in the American and European countries, but research on pedestrian in Asia has been overlooked (Yuen and Chor, 1998).

Some cities like Cambridge, Vancouver, Boulder, Minneapolis, San Francisco, Seattle, Hong Kong, and Singapore have provided beneficial directions at the pedestrians such as the provision of a sustainable and accessible network just like the City of Minneapolis with 90 percent of its road are facilitated with sidewalk area (Muhlbach, 2012). The pedestrian way is also supported by the existence of a clear and precise master plan for pedestrians which is available in the city of San Francisco and Seattle. In addition to a connected and accessible pedestrian area, crosswalks are also one of the focuses to encourage people to walk. A safe crosswalk is required and should be accessible to every community including persons with disabilities. For instance, Minneapolis designs a crossing area with traffic lights and signposts aimed to protect a crossing pedestrian, while Seattle conducts crossing security with traffic control that is by setting speed limits for vehicles. In Asia, Singapore provides both underpass and overpass, with underpasses based on subway and overpass rests on every

commercial building. In Hong Kong, pedestrians are top priorities in the transportation system so that their direction of policies tends to benefit pedestrians.

Traffic calming is one of the strategies to increase the protection for pedestrian by physical design, provides sidewalk extention which reduces pedestrian crossing distance and increases the pedestrian space to improve the safety for pedestrians. Providing areas for street furniture and benches, transit stop, trees and landscaping may be implemented in the city. For instance, limited freeway in Vancouver has increased the safety for pedestrian due to the traffic calming strategy which makes vehicle has maximum speed limit. It has been succesfully in encouranging the citizen to walk. Traffic calming approach is also applied in Hong Kong by reducing the street parking, while Singapore provides wider green belt area to strengthen the pedestrians way independency.

In some safety issues, a few steps for personal safety for citizen can be implemented, such as special staff assignments for pedestrian issues and safety in Minneapolis, Seattle and San Fransisco, where they educate the staff and law enforcement related to pedestrians issues and safety.

In the aspect of design, it relates to the land use and amenities. Vancouver commercial area adopted the mixed-use form with shophouse model and residential in Hong Kong commercial area were built above the mall/shoppping complex. Vancouverites were familiar with this type of housing form and felt comfortable with it and developed as an accepted form in every commercial area in Vancouver (James, 2017). Singapore also adopts this approach in small scale by compacting the provision to increace the intensity of walking within the reachable destination.

Besides that, the fulfillment of the overall needs will result in community moving rarely to a far place in order to meet their needs. With the fulfillment of easy to reach need and is also supported with good transit which make it easier to walk in the city. This can be seen in Vancouver where the pedestrian area becomes alive with various activities because people are moving between buildings to meet their needs.

Another essential element is providing amenities as to ensure safety while walking such as lighting along the pedestrian sidewalk in Minneapolis and traffic light for crossing and signage in Boulder and Seattle. The function of the pedestrian realm in Boulder and Seattle, by enhancing the sidewalk with vegetation as a buffer zone along with its maintenance, is to keep the aesthetics and comfort during walking. Providing park in public space and as a rest area in some segments of pedestrian sidewalk are also evidenced in Singapore and San Fransisco.

Then for policy issues and government empowerment, all walkable cities have a clear and firm policy on pedestrian issues. Setting guidance and master plan for the provision of roads for pedestrians is an early stage of establishing pedestrian-friendly communities and empowering communities for active transport. Seattle has achieved success as a walkable city through the establishment of a master plan that has a clear purpose and size. In addition, Seattle also sets the design to prioritize pedestrians especially for vulnerable groups such as the elderly.

The provision of special programs such as the "Walk First" or "Sunday Street" event in San Francisco that prioritize pedestrians also helps in increasing the number of pedestrians significantly. Walking campaigns were also conducted in Minneapolis and Seattle, while Boulder conducts campaigns through routine education through the upholding of rights and responsibilities for pedestrians, bicycles, and motorized vehicles.

In addition to that, there is a more rigorous policy approach like in Cambridge, known as a walkable city model due to its parking policy (Riggs, 2017). Students in Cambridge are not allowed to buy parking tickets and are forced to ride bicycles or to walk. This is done to encourage communities to support active transport and help reduce the adverse effects of vehicles and improve public health. Besides that, private vehicles are also forbidden to cross the city center in order to ensure the walkability in the city of Cambridge. The city uses a policy approach called 'filtered permeability', which allows different types of vehicles to pass through certain areas where the area filters out other transport models (Riggs, 2017). Thus, transportation without a motorized vehicle is permitted to pass through in the city area. Other policies which were made are limiting speed only up to 20mil/hour in order to support the safety and pedestrians comfort.

Hong Kong can be considered as a walkable city among other countries in Asia, offering good infrastructure and facilities for pedestrians and has the highest score of walkability ratings of 70 out of 100 (Leather et al., 2011).
Policies and encouragement to use the public vehicles are also evidenced in Singapore and Bangkok. Although, they were not included in the Walkable city survey, data from the Asian Development Bank per year in 1999 stated that 40% of people choose to use public transport. But there is still a 20% of people choose to walk in Bangkok. This suggests that public transport also affects the desire to walk. Singapore has shown excellent transit oriented, where an average of 300 meters there will be a bus stop that makes it is easy for people to walk (Leather, et al., 2011)

3 METHODOLOGY

This paper presents the results of an observation of pedestrian sidewalks in historical area in Banda Aceh. Observation of the pedestrians ways condition was conducted in major road in old town zone. Several data from observation was taken, documented and recorded to gain the characteristic of the design and safety aspects of pedestrian sidewalks such as material, wide, crossing, trees and determine the utilize of pedestrian ways. The findings were analysed through a review of theories and best practices that have been implemented in walkable countries. From the literature review and direct observation, this study is expected to provide a valid and reliable results.

4. PEDESTRIAN FACILITIES IN BANDA ACEH HISTORICAL AREA

Urban design plays an important role to encourage the community to walk, and it is becoming a concerned to urban designers to make better places to walk – not only as a physical activity, but also for the sensorial and experiential pleasure that may be derived from such environments (Frank et al., 2007). In the planning literature, the most common research areas that deal with aspects of the environment which affect walking behavior comprises the three ‘‘D’s’’ of the built environment – Density, Diversity, and Design (Cervero and Kockelman, 1997).

In design aspect, some street corridors in historical area in Banda Aceh city do not imply a holistic design to achieve a “pedestrianisation”. Limited width of pedestrian sidewalk were found in Peunayong area (in front of the shoplot) (Figure 1: 5B, 5C) and area near Aceh Museum and it follows with poor pavement condition (Figure 1: 3A, 3B, 3C). The sidewalk cannot be fully utilised by pedestrians since they have to share with street food, vendors, chairs and tables, flower pots, and even motorcyle. As a result, this condition has put difficulties for pedestrians movement (Figure 1: 1A, 1B). A better condition is shown in surrounding Baiturrahman Great Mosque (Picture 1C), where only some corridors can be fully utilised by pedestian (even in limited width). But material pavement standard should be solid, stable, coarse-grained and guiding block for disability was not implemented in all pedestrians sidewalk except only in Museum Aceh and Taman Sari area (Figure 1: 4A, 4B). In 2017, a revitalisation was conducted in “Taman Sari” as a public space in historical area by widening the sidewalk for the purpose ofpleasant and attraction. As a result, it creates a vibrant environment of walking (Figure 1: 2A, 2B, 2C, 2D). Shading is used a tool of design features in pedestrians sidewalk that contributes to comfort while walking. Around the shoplot in Peunayong area, the shading comes from the shoplot itself, as there is no vegetation able to be planted as a natural and artificial shading. The various forms of shadings have degradated the aestatics apperances of the area. Meanwhile public space in “Taman Sari” and Aceh Museum which supposedly have a lot of vegetation planted, yet the natural vegetation is still not shady and lush. Thus, a reforestation is needed in order to increase people’ interest to walk around at “Taman Sari”. Bench and dust bin are amenities that are not provided along the sidewalk except in the pedestrian area of the Museum Aceh.

On the matter of safety issues of pedestrian there are only a few primary road which has crossing zone and is lacking in signage and markers for pedestrians in most of the area. The crossing zone (without traffic signal) is only available on the primary road in Peunayong area (Figure1: 5A), however it is not provided in the other historical area. This condition may cause the casualty to

pedestrians. The crossing path is not designed on the same level of street but pedestrians have to step on the curb side or median. Distress will be felt by pedestrian especially for people with disability. Nowadays, Indonesia is obliged to implement a disability-friendly design in all aspect. For instance, in all corridors of historical area, the curb side and ramp are extremely not adjusted with the road/street and crossing level. This was due to ramp not being provided by shoplot and misused by motorcycle as parking area, which resulted inconvinience to the pedestrians when crossing. Some obstacles are also found at public space entrance (such as taman sari, Figure 1: 2B, 2C) where they put poles in the pedestrians way.

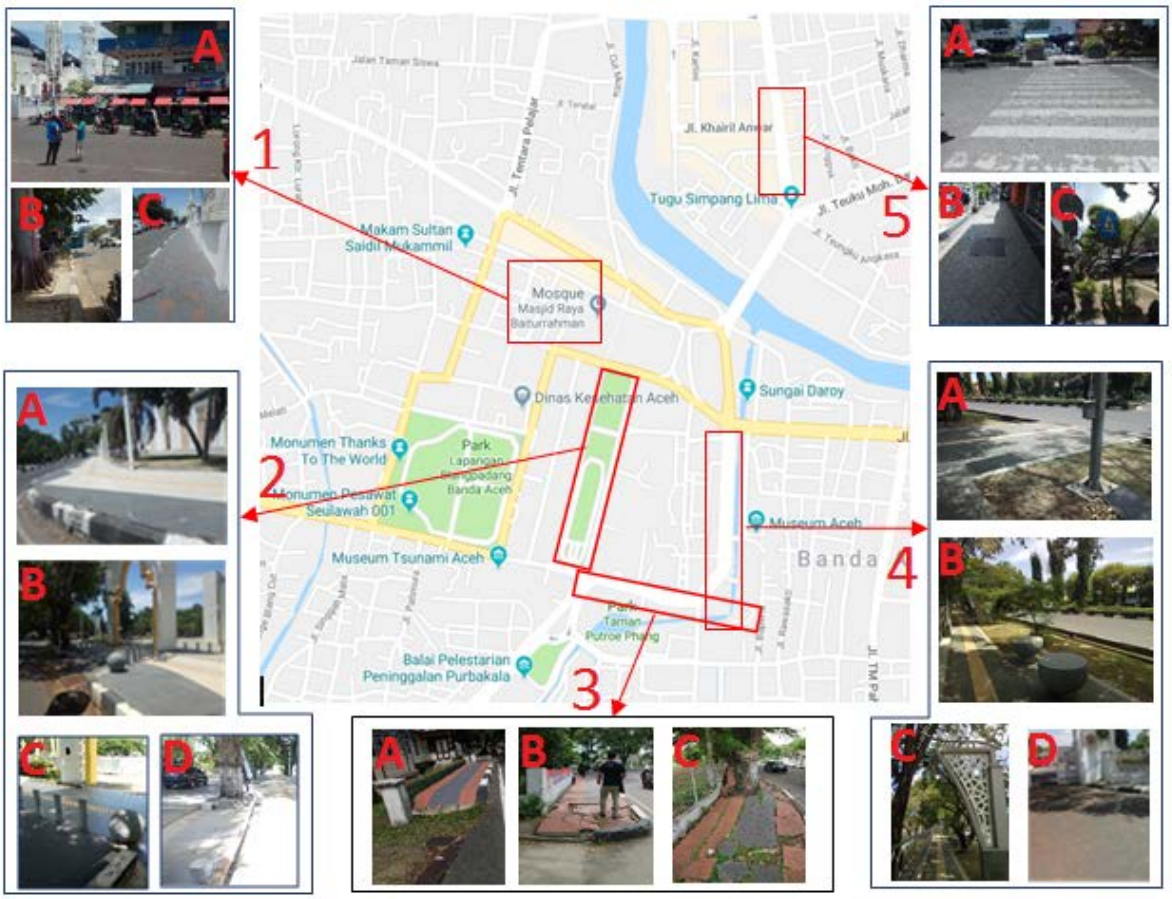

Figure 1 Existing Condition at Banda Aceh Historical Area

To create Banda Aceh into a pedestrian-friendly city, some development concepts for sidewalk pedestrians must be considered, namely providing a wide pedestrian way that will increase the pedestrians volume and comfort, pedestrian security improvements (in the crossing area, providing ramps, guiding block and material), shade (natural vegetation most likely rather than artificial), amenities (lighting, bench, dust bin), design of attractive public space with affordable distance between activity support, and aesthetic enhancement.

In addition, creating attractive designs for walking will encourage people to walk by the attractive pavement design and use the attractive features around them. Basically, the old town area already has its own cultural appeal, meaning that it already has a significant value. But it is still not highlighted enough because there is an impression of not being open because of the far distance from the road and also the high fence. This can be solved by showing its flagship features around the road. The area around the Aceh museum has begun to follow this method by installing signage containing documentation of historical relics in the museum, and the need for an attractive arrangement of the regular street vendor in order to support activity around the area, like the Baiturrahman Grand

Mosque where the community begins to organize street vendors around the mosque. Furthermore, the emphasis on disable-friendly design needs to be put in place such as in the provision of pedestrian facilities in Banda Aceh.

A policy that governs the control of the old town of Banda Aceh is required. For instance the policies that prioritizes pedestrians such as traffic calming in certain primary road with high traffic can be adopted instead of limitation or banned the vehicle from entering the historical area because there is no alternative road that can divert driver to their destination. In some cases, a ban on motor vehicles – pedestrianisation– has been introduced to remove traffic from conservation or retailing areas in order to create a more pleasant environment for the pedestrian like in Cambridge (Riggs, 2017). Strict parking can be applied in some areas such as "Taman Sari" by utilizing the available parking at Baiturrahman Grand Mosque and then explore the area on foot.

The lack of law enforcement against violations at pedestrian facilities reflects an "omission" towards the offense. As a result, this illustrates a "justification of the offense"

4 CONCLUSION

As one of the 10 selected heritage cities in Indonesia, Banda Aceh has to put in special attention to support the facilities in the historical area. Creating "pedestrianisation" in the historical area is an important element in supporting the " Program Penataan dan Pelestarian Kota Pusaka (P3KP)". Besides, creating the ambience an old city would be able to provide more experience for visitors to explore various features in the old town area. With cultural and historical appeal, provision must be easier because the government only needs to improve the atmosphere to encourage people to walk in the old town area.

This can be done by providing a design that attracts people's interest to walk while ensuring the pedestrian's safety and security. This can be accomplished by increasing the pedestrian capacity, setting pedestrians as a priority through the procurement of secure cross-sections and the provision of connectivity between crossings with appropriate ramps and curbs that are more accessible for every community especially for people with disabilities.

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