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Generating walkability concept for basuki rahmat corridor: a content analysis

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Abstract
Walkable City is a term for a city that has good pedestrian paths by considering 6 aspects such as connectivity, linkage with other modes of transportation, sound land use patterns, safety, quality of pedestrian paths, and the condition/atmosphere of pedestrian paths (Southworth, 2005). This study focuses on the Tunjungan area, specifically the Jalan Basuki Rahmat corridor, as it is crucial for accessibility to the trade and service area of Surabaya City. The objective of this study is to evaluate the environment of the Basuki Rahmat Street corridor and assess the current condition of pedestrian pathways. The research inquiries are as follows: 1. Identifying Basuki Rahmat sidewalk condition; 2. Generating Walkability concept through Content Analysis. Before determining the corridor segment for survey purposes, field observations are carried out as a whole. Based on these observations, 2 significant intersections divide the study area into 3 equal sizes. In addition, the existence of bridges as pedestrian crossing facilities and bus stops as pedestrian transit points is an important consideration. The Narrative process is carried out to formulate the concept of developing a walkable city. Based on the analysis results, appropriate development concepts are divided into 2, namely macro and micro development concepts. This is because the analysis of the previous target measures general and specific/detailed things, so it is necessary to distinguish between overall concepts and specific/complex concepts.
Keywords: content analysis; depth interview; pedestrian; sidewalk; walkability

1. Introduction

All human activities need space. This is reinforced by the statement of Law No. 26 of 2007 concerning Spatial Planning that space is a container that includes land space, sea space, and air space, including space inside the earth as a unified territory where humans and other creatures live, carry out activities, and maintain its survival. Experts also define open play as one of the urban spatial structures in the form of voids in which functional activities or ritual activities occur that bring together groups of people in their everyday daily routines and periodic activities so that it can also be used as one of the support social interaction (Carr, 1992; Zahnd, 1999). According to Hamid Shirvani (1985), the elements of open space are all landscape appearances, hardscape (roads, sidewalks, etc.), parks, and urban recreation spaces. Open spaces dominated by the natural environment outside and inside the city, in the form of parks, courtyards, city recreation areas, and green belts, are called green open spaces (Trancik, 1986). One of the elements of urban design that can shape the city's image is pathways, one example of which is pedestrian paths (Lynch, 1960). City image is the thoughts of the city from the people who live in it and can be influenced by various things such as physical objects, the social meaning of an area, its function, history, and even its name (Zahnd, 1999; Lynch, 1960).

Walkable City is a term for a city that has good pedestrian paths by considering 6 aspects such as connectivity, linkage with other modes of transportation, sound land use patterns, safety, quality of pedestrian paths, and the condition/atmosphere of pedestrian paths (Southworth, 2005). New Urbanism is an alternative to city expansion, with development starting at the minor point of the city, namely the community (Leccese & McCormick, 2000). In mitigating the adverse effects of urban sprawl, new development, redevelopment, and services for connected pedestrian-friendly and transit areas with a greater concentration of activities can be carried out (Leccese & McCormick, 2000). Convenience in walking about overcoming the spatial effects of urban expansion can be realized with the concept of a walkable city.

According to Jeff Speck (2009), the critical things in the concept of walkability are the safety, comfort, and visual appeal of pedestrian paths. In this case, Jeff Speck (2009) summarizes the previous principles to make them more straightforward and concise. If elaborated further, the contents do not change from the previous principles.

According to D.K Halim (2008), in his book entitled Urban Environmental Psychology, people's perceptions of their dwellings and communities are influenced by congruence, which means that the environment facilitates people's behavior according to their wishes to prevent people from changing environmental settings, but to change their behavior so they can adapt to these conditions as a function control over the environment because cities are the result of human activities that have various social traits and characteristics. Perception will affect the behavior of pedestrians on the performance of pedestrian paths (Assael, 1995 in Sodik, 2003). Changes in people's behavior need attention because pedestrian paths which are part of urban space, are meeting platforms for complex interactions between individuals and between communities for various purposes, including housing, work, and entertainment (Heryanto, 2011).

In the 1990s, several urban and environmental designers discussed various issues related to suburban expansion, including income disparities, environmental degradation, and rampant use of motorized vehicles. The New Urbanism movement became known in the 1970s and 1980s in America. The principles of New Urbanism are clearly illustrated in the book Charter of the New Urbanism (Leccese & McCormick, 2000). The nature of being friendly to pedestrians is one form/pattern of the theory of New Urbanism. New Urbanism is also known as neotraditional design, transit-oriented development, and traditional or neighborhood development (TND). The following is the definition of New Urbanism according to some experts:

1. Robert Steuteville, 1998: an alternative to Modernity, automobile-oriented Planning, and Development
2. Charles C. Bohl, 2000: a movement in architecture and planning with a design strategy based on "traditional" urban forms to prevent urban sprawl and inner-city decline and to rebuild neighborhoods, villages, and cities.
3. G. B. Arrington, 2001: New Urbanism talks about how to civilize the transportation system
4. Congress for the New Urbanism (CNU), 1980: the movement to restore urban centers, reconfigure suburban areas, preserve the environment and culture
5. As the Charter of the New Urbanism, 2000: public policy practice and development with the principles: the environment should be diverse in land use patterns and population; people must be designed to walk; cities must be shaped by the physical space of public and universally accessible; cities are designed based on local history, climate, ecology, and building practices.

From the various definitions of the theory of New Urbanism above, it can be seen that an integrated transportation system, varied land use patterns, and environmental preservation are needed to restore cities affected by the expansion phenomenon. This theory is an alternative to reorganizing public policies related to environmental variations for pedestrians and motorized vehicle users. To create an integrated transportation system, it is necessary to support the most environmentally friendly mode of transportation, namely walking. This concept tries to find an alternative way to the suburban sprawl phenomenon

through design principles that consider more traditional types of neighborhoods and create "human-scale, walkable communities."

From the discussion above, the concept of a walkable city is a derivative of the theory of New Urbanism. The approach will be achieved if these principles are integrated. For the corridor context, the appropriate regulations are connectivity, mixed land use, environmental preservation, quality of life for urban communities, social interaction, and convenience obtained from various attributes of pedestrian paths for the community. Areas with good quality pedestrian paths must be supported by a connected road network so that time is efficient for moving from one place to another. In addition, the pattern of mixed land use and integrated transportation also supports the ease of community activities.

Meanwhile, according to the Charter of New Urbanism (Leccese & McCormick, 2000), there are 27 principles of New Urbanism which are divided based on the regional scale, such as metropolitan areas, neighborhoods, districts, and corridors as essential urban elements, followed by urban design principles for mass blocks, roads, and buildings.

This study focuses on the Tunjungan area, specifically the Jalan Basuki Rahmat corridor, as it is crucial for accessibility to the trade and service area of Surabaya City. In accordance with the Minister of Public Works Regulation No.03/PRT/M/2014, it is vital to provide a safe, comfortable, and humane pedestrian network in urban areas to enhance the mobility of urban residents. The utilization of trade and service land is one of the primary activity generators in the study area, which has previously revived this corridor. The objective of this study is to evaluate the environment of the Basuki Rahmat Street corridor and assess the current condition of pedestrian pathways. The research inquiries are as follows:

1. Identifying Basuki Rahmat sidewalk condition
2. Generating Walkability concept through Content Analysis

This research has clear goals to identify what elements should be improved through street context. Thus, this study will produce profound observations on how the concept of Walkability can work on the corridor.

2. Methods

The sampling technique in this study aims to gather the information that will form the basis of the emerging designs and theories. This study's sampling technique was carried out on community respondents and area and building sampling.

2.1. People Sampling

Respondent sampling methods used in this study were random sampling and purposive sampling.

- ➢ Purposive sampling carefully selects respondents to fulfill research objectives (Sugiyono, 2009). To determine the sample by purposive sampling, stakeholder analysis was carried out with the following stages:
    - Identify all stakeholders involved, consisting of the government, private sector, and the community
    - Conduct interest analysis by giving each stakeholder a score
    - Conduct stakeholder mapping based on the level of importance to identify

The key stakeholders selected as resource persons in this study are as follows:

- Government
- The community, which consists of academics and walkers

The desired respondent criteria are:

- Expert/practitioner (Dr. Ing. Ir. Bambang Soemardiono)
    - Graduates and experts in urban and/or urban landscape design
    - Have research experience in the field of city design and/or urban landscape of the City of Surabaya within the last 5 years
    - Have at least 1 scientific work related to the concept of walkability in the city of Surabaya in the last 5 years

- Government (Department of PU Bina Marga and Pematusan City of Surabaya, Office of Sanitation and Landscaping of Surabaya City)
    - Involved in the design of pedestrian paths in the city of Surabaya
    - Involved in the maintenance of pedestrian paths in the city of Surabaya
- Pedestrians (Head of the Manic Street Walkers Surabaya Program)
    - Engage in regular walking activities around the city of Surabaya
    - Ever been involved in walking activities along the corridor route on Jalan Basuki Rachmat, Surabaya City

2.2. Area Sampling of Pedestrian Traffic Counting Survey

Before determining the corridor segment for survey purposes, field observations are carried out as a whole. Based on these observations, 2 significant intersections divide the study area into 3 equal sizes. In addition, the existence of bridges as pedestrian crossing facilities and bus stops as pedestrian transit points is an important consideration. Therefore, the survey area is divided into 3 parts, wherein each segment has at least 1 pedestrian bridge and 1 bus stop. Sample areas for conducting pedestrian traffic counting are determined based on several criteria, namely:

- The counting point is close to the pedestrian bridge and bus stops. Crossing bridges and bus stops are considered pedestrian movement nodes, so they were chosen as a special provision for selecting survey areas. In addition, the pedestrian bridge facilitates counting activities.
- Counting points without crossing. It is considered that intersections in pedestrian paths will interrupt observations during counting, so to facilitate survey activities, observation points are determined without intersections.

2.3. Building Sampling

The buildings observed in this study are trade and service buildings because they are considered the biggest generators of activity in this region.

2.4. Time Sampling

The determination of the 3 times of the working day is based on field observations. After carrying out field observations, it is known that peak-hour traffic in the Jalan Basuki Rahmat Corridor occurs at times specified above. The determination of time on working days is based on field observations. After carrying out field observations, it is known that peak-hour traffic in the Jalan Basuki Rahmat Corridor occurs at times specified above. There is much movement in the morning because it is the time to go to work, school, and other. During the day, there is much movement due to rest hours. Meanwhile, there is much movement in the afternoon due to work hours. From these times, it is assumed that vehicular traffic and people influence the movement of pedestrians in the observation area.

The determination of morning and evening hours on weekends is based on the assumption that this corridor will be crowded with people throughout the day on weekends, so morning/afternoon/night time can be taken.

2.5. Analysis Techniques

Analytical methods that can be used according to each research target include:

2.5.1. Calculate the level of pedestrian service

The level of service (Level Of Service) of pedestrians is a rating scale to measure and describe the overall condition of the pedestrian environment (Kerridge et al., 2001). This method creates a scale from "A" to "F." LOS "A" describes the ideal pedestrian environment, while LOS "F" is the least ideal pedestrian environment for pedestrians (Fruin, 1971).

In this target, the analysis technique used is the descriptive qualitative analysis and service level analysis. Qualitative descriptive analysis is used to describe the characteristics of pedestrian movement. Meanwhile, service level analysis measures pedestrian paths' LOS (Level of Service) value in the observation area. In determining the level of service in

pedestrian space, 2 criteria are needed, namely the average flow of pedestrians and pedestrian space:

- **The average flow of pedestrians** is defined as the number of pedestrians passing a point in unit time and expressed in units of pedestrians per 15 minutes (Ped/15 minutes). To calculate the value of the pedestrian flow at the most significant 15-minute interval, the following formula is used:

$$Q\_15 = Nm/15WE$$

(Source: Highway Capacity Manual, 1985)
with,
Q15= the greatest flow of pedestrians at 15 minute intervals (pedestrians/min/m)
Nm = the highest number of pedestrians at 15 minute intervals (pedestrians)
WE = effective width of pedestrian space (meters)

- **Pedestrian space,** defined as the average area needed by each pedestrian and expressed in units of m^2/Ped.

$$S\_(15)= 1/D\_15$$

(Source: Highway Capacity Manual, 1985)
with,
S15 = space for pedestrians at the time of the biggest 15 minute flow (m^2/pedestrian)
D15 = density at the time of the greatest 15 minute flow (pedestrians/m^2)

To get the value of S and D, the following formula is used:

$$S=Vs/Q= 1/D$$

(Source: Highway Capacity Manual, 1985)
With,
S = pedestrian space (m^2/pedestrian)
D = density (pedestrians/m^2)
Q = current (pedestrians/min/m)
Vs = average speed of space (m/min)

$$D= Q/Vs$$

(Source: Highway Capacity Manual, 1985)
With,
D = density (pedestrians/m^2)
Q = current (pedestrians/min/m)
Vs = average speed of space (m/min)

Meanwhile, to get the value of Vs and Q use the formula:

$$Vs = \frac{1}{\frac{1}{n}\sum_{i=1}^{n}\frac{1}{Vi}}$$

(Source: Highway Capacity Manual, 1985)

With,
Vs = average speed of space (m/min)
N = number of pedestrians
Vi = speed of each pedestrian observed (m/min)

$$Q = \frac{N}{T}$$

(Source: Highway Capacity Manual, 1985)
With,
Q = pedestrian flow (pedestrians/min/m)
N = number of pedestrians passing per meter (pedestrians/m)
T = observation time (minutes)

Based on the calculation of LOS for pedestrian paths, the value of the level of service for pedestrian paths in the study area is as follows:

Table 1. LOS Value of Pedestrians in Observation Areas

No.	Segment	LOS
1.	Segmen A1	F
2.	Segmen B1	E
3.	Segmen A2	B
4.	Segmen B2	B
5.	Segmen A3	A
6.	Segmen B3	B

Source: Analysis Results, 2015

Explanation of each LOS value is:

1. Segment A1

Segment A1 gets an F value which means that pedestrians walk at a prolonged and limited flow speed because there are frequent conflicts with pedestrians going in the same direction or opposite. Standard F is no longer comfortable and does not match the pedestrian space capacity. The calculation results found that the pedestrian density at the time of the enormous 15-minute flow was 9.23 pedestrians/m2, which occurred at 17.15-17.30 WIB, so the pedestrian space value was 0.11 m2/pedestrian. However, based on the results of interviews (2015), most pedestrians feel comfortable with the capacity of the existing pedestrian lanes. It is just that the obstacles are the sidewalk material starting to break down and the green lane in the middle of the sidewalk. This phenomenon is because the movement in segment A1 has not reached the limit with a pedestrian speed of 27 m/min. In addition, the time interval for walking between pedestrians is quite far due to the different opening hours of activities, such as banks which open at 08.00 WIB, shopping centers (TP) which open at 10.00 WIB, and restaurants which open at 09.00 WIB.

2. Segment B1

Segment B1 gets an E value, meaning pedestrians will have the same speed because there are many pedestrians. Reversing direction or stopping will have an immediate impact on the current. The movement will be relatively slow and irregular. This situation is starting to be uncomfortable to walk through, but it is still the lower pedestrian space design capacity

threshold. The calculation results found that the pedestrian density at the time of the enormous 15-minute flow was 1.18 pedestrians/m2, which occurred at 19.45-20.00 WIB, so the pedestrian space value was 0.85 m2/pedestrian.

3. Segment A2

Segment A2 gets a B score, which means pedestrians can still walk comfortably and quickly without disturbing other pedestrians. However, the presence of other pedestrians has begun to affect the flow of pedestrians. The calculation results found that the pedestrian density during the enormous 15-minute flow was 0.17 pedestrians/m2, which occurred at 07.45-08.00 WIB, so the pedestrian space value was 5.81 m2/pedestrian.

4. Segment B2

Segment B2 gets a B score, which means pedestrians can still walk comfortably and quickly without disturbing other pedestrians. However, the presence of other pedestrians has begun to affect the flow of pedestrians. The calculation results found that the pedestrian density at the time of the enormous 15-minute flow was 0.18 pedestrians/m2, which occurred at 07.15-07.30 WIB, so the pedestrian space value was 5.45 m2/pedestrian.

5. Segment A3

Segment A3 gets an A rating which means pedestrians can walk freely, including being able to determine directions freely, at a relatively fast speed without causing disturbances between pedestrians. The calculation results found that the pedestrian density at an enormous 15-minute flow was 0.07 pedestrians/m2, which occurred at 17.00-17.15 WIB, so the pedestrian space value was 15 m2/pedestrian.

6. Segment B3

Segment B3 gets a B score, which means pedestrians can still walk comfortably and quickly without disturbing other pedestrians, but the presence of other pedestrians has begun to affect pedestrian traffic. The calculation results found that the pedestrian density at the time of the most significant 15-minute flow was 0.16 pedestrians/m2, which occurred at 07.00-07.15 WIB. Hence, the pedestrian space value was 6.22 m2/pedestrian.

2.6. Content Analysis

To formulate the concept of a walkable city on the Jalan Basuki Rahmat corridor, a Content Analysis was carried out according to the stages described in the methodology chapter. The stages are:

1. *Unitizing*

Based on the results of target 2, the sub-variables that will be analyzed in this final target are:

Table 2. Variables Used for Content Analysis

No.	Variable
1.	Location of crossing facilities (bridges, zebra crossing etc.)
2.	Number of crossing facilities (bridges, zebra crossing etc.)
3.	Number of signs (no parking, no stopping etc.)
4.	Point location markings (no parking, no stopping etc.)
5.	Number of street lights
6.	Location of street lights
7.	Number of shade trees
8.	Point Location of shade trees
9.	Number of seats along the sidewalk

10.	Location of seating points along the pavement
11.	Number of trash cans
12.	Location of trash cans
13.	The use of pedestrian paths by certain social groups
14.	The existence of the sidewalk as a place of interaction
15.	The existence of corridors of shopping center buildings as a place of interaction
16.	The existence of office open spaces as a place to interact
17.	The existence of the edge of the green lane as a place to interact
18.	Sidewalk design
19.	Varied vegetation
20.	Types of public transport
21.	Number of public transport
22.	Ease of pedestrians to reach the location of public transport stops (10-20 minutes)
23.	Convenience of pedestrians to reach their destination (10-20 minutes)
24.	Type and length of special lanes for people with disabilities (disabled people) on the sidewalk
25.	Building Covered Ratio (BCR)
26.	Floor Area Ratio (FAR)
27.	Property Line

Source: Author, 2015

2. *Sampling*

The selected informants are:

- Macro Concept
    - Academician (Pak Bambang). The respondents were selected by purposive sampling because the macro concept was formed based on the LOS (level of service) of pedestrians so that there would be many technical matters that only urban design/urban landscape experts would understand.
- Micro Concept
    - Government (Department of PU Highways and Pematusan City of Surabaya, Office of Sanitation and Gardening of Surabaya City)
    - Academician (Mr. Bambang)
    - Head of the Surabaya City MSW Program (Anitha Silvia)

3. *Recording*

This process is described in the form of interview transcripts as in Appendix D. Objectives of 3-Content Analysis

4. *Reducing*

The coding process was carried out as in Appendix D. Objectives of 3-Content Analysis

5. *Inferring*

This process is carried out by classifying the respondents' answers according to the variables used as shown below:

Table 3. Classification of Micro Concept Variable Coding based on LOS Value

No.	LOS	Respondent (R2)
1.	F	T2.17, T2.18
2.	E	T2.19
3.	B	T2.20
4.	A	T2.21

Source: Analysis, 2014

Table 4. Classification Coding Sub-variables Micro Concept Walkable City

No.	Sub-variable	Respondent			
		R1	R2	R3	R4
1.	Location of crossing facilities (bridges, zebra crossing etc.)	T1.7	T2.3, T2.4	T3.4	T4.1
2.	Number of crossing facilities (bridges, zebra crossing etc.)	T1.8	T2.3, T2.4	T3.4	T4.1
3.	Number of signs (no parking, no stopping etc.)	T1.15 , T1.20	T2.8	T3.8	T4.1
4.	Point location markings (no parking, no stopping etc.)	T1.15	T2.8	T3.8	T4.1
5.	Number of street lights	T1.10	T2.5, T2.6	T3.5	T4.1
6.	Location of street lights	T1.9	T2.5, T2.6	T3.5	T4.1
7.	Number of shade trees	T1.11 , T1.13	T2.7	T3.6	T4.1
8.	Point Location of shade trees	T1.1, T1.14	T2.7	T3.6	T4.1
9.	Number of seats along the sidewalk	T1.16	T2.9	T3.9	T4.1
10.	Location of seating points along the pavement	T1.16	T2.9	T3.9	T4.1
11.	Number of trash cans	T1.2, T1.5	T2.1	T3.7	T4.1

12.	Location of trash cans	T1.3, T1.4	T2.1	T3.2	T4.1
13.	The use of pedestrian paths by certain social groups	T1.21	T2.15	T3.14	T4.6
14.	The existence of the sidewalk as a place of interaction	T1.22	T2.16	T3.15	T4.7
15.	The existence of corridors of shopping center buildings as a place of interaction	T1.22	T2.16	T3.15	T4.7
16.	The existence of office open spaces as a place to interact	T1.22	T2.16	T3.15	T4.7
17.	The existence of the edge of the green lane as a place to interact	T1.22	T2.16		T4.7
18.	Sidewalk design	T1.6	T2.2	T3.3	T4.1
19.	Varied vegetation	T1.12	T2.7	T3.6	T4.1
20.	Types of public transport	T1.17	T2.10	T3.12	T4.1
21.	Number of public transport	T1.17	T2.10	T3.12	T4.1
22.	Ease of pedestrians to reach the location of public transport stops (10-20 minutes)	T1.18	T2.12	T3.10	T4.1
23.	Convenience of pedestrians to reach their destination (10-20 minutes)	T1.18	T2.12	T3.10	T4.1
24.	Type and length of special lanes for people with disabilities (disabled people) on the sidewalk	T1.19	T2.13	T3.11	T4.1
25.	Building Covered Ratio (BCR)	T1.23	T2.9	T3.13	T4.5
26.	Floor Area Ratio (FAR)	T1.23	T2.9	T3.13	T4.5
27.	Property Line	T1.23	T2.9	T3.13	T4.5

Source: Analysis, 2015

3. Results and Discussion

3.1. Macro Land Use

Land use in the study area is dominated by trade and services. Jalan Basuki Rahmat, the golden triangle area of Surabaya, has grown into a trade, service, and office area that significantly contributes to the city's economy. Physically, both administrative and business activity centers are scattered along this corridor so that mobility facilities are more commonly found on Jalan Basuki Rahmat, a north-south corridor. Land use along the Basuki Rahmat Corridor includes an allotment of trade and services, green open spaces, and the provision of city facilities, including public government facilities, offices, and public trade and services facilities. The percentage of macro land use in the study area is as follows:

Tabel 5. Proportion of Land Use

No.	Land Use	Area (Ha)	Percentage (%)
1.	Residential	0,34	1,65
2.	Commercial and Business	19,05	92,4
3.	Public Ammenity	1,04	5,04
4.	Green Open Space	0,178	0,86
	Jumlah Total	20,60	100

(Source: ArcGIS Calculation Results, 2014)

Based on the calculation of the proportion of land above, the percentage of trade and services dominates the research area. The map of macro land use in the study area can be seen in Figure 1. Macro Land Use.

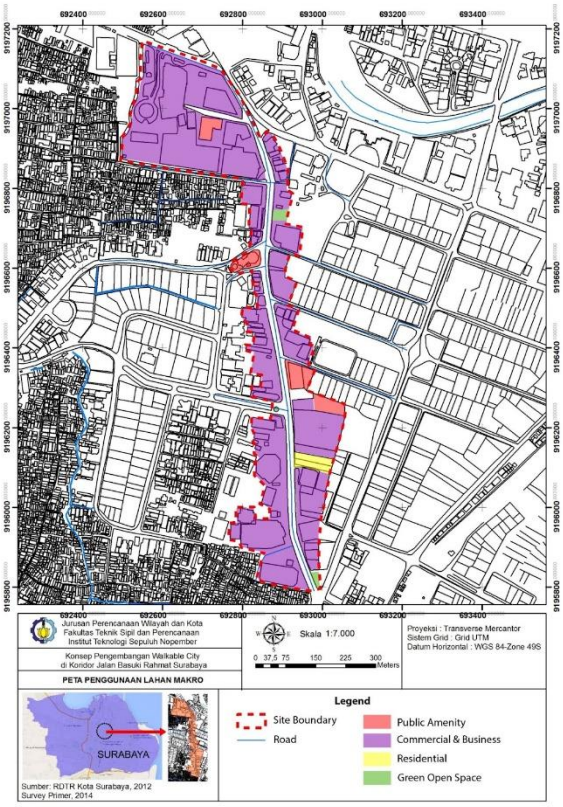

Figure 1. Macro Land Use
(Source: Analysis, 2015)

3.2. Micro Land Use

Micro land use in the study area is divided into trade and services. The trading area consists of the following:

Table 6. Allotment of Commercial Land

No.	**Commercial & Business**	**Unit**
1.	Shopping Center	1
2.	Shophouse	9

3.	Supermarket	1
4.	Minimarket	1
6.	Restaurant	2
7.	Cafe	1
8.	Hotel	6
9.	Showroom	4
10.	Bank	5
Total		**30**

Source: Primary Survey, 2014

3.3. Space Utilization Intensity (Building Covered Ratio, Floor Area Ratio, Property Line)
Based on field observations supported by the Basuki Rahmat Corridor UDGL literature survey, the IPR (Spatial Utilization Intensity) conditions in the study area are as follows:

Table 7. Conditions of BCR, FAR, and PL

No.	IPR Element	Remark
1.	Building Covered Ratio (BCR)	Dominated by scores of 60-80% and >80%
2.	Floor Area Ratio (FAR)	Dominated by values of 200-400% and >400%
3.	Property Line (PL)	Dominated by sizes 3-6 meters and > 6 meters

Source: Primary Survey, 2014

Information regarding the IPR (Intensity of Space Utilization) in the observation area can be seen more clearly in Figure 2. Spatial Utilization Intensity Map

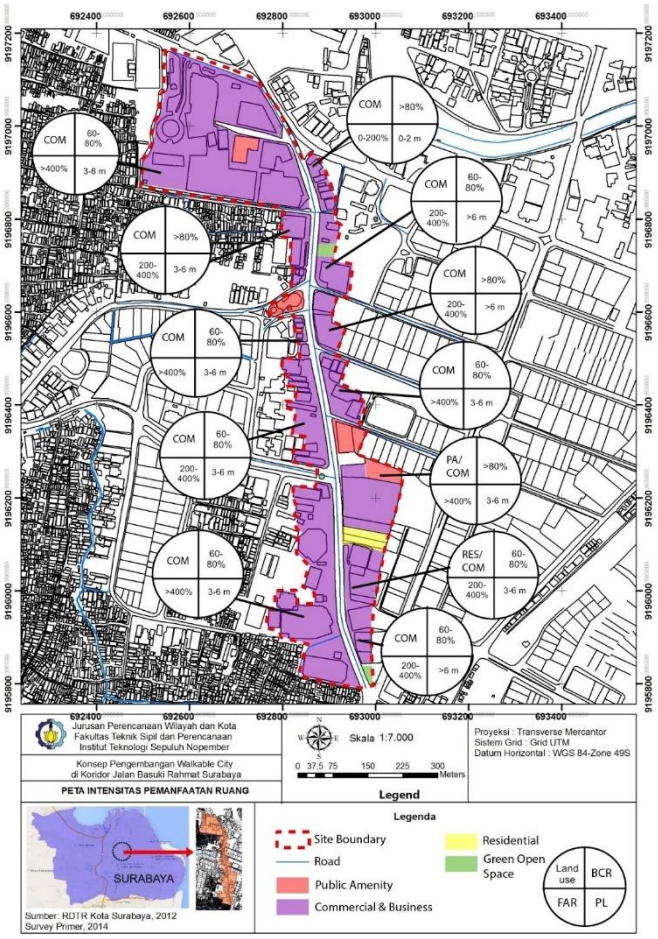

Figure 2. Spatial Utilization Intensity Map
(Source: Analysis, 2015)

3.4. Typology Of Pedestrian Pathways Corridor Jalan Basuki Rahmat

Pedestrian space in the corridor of Jalan Basuki Rahmat includes the type of Pedestrian Space on the Side of the Road (Sidewalk), which is a system of pedestrian paths from the edge of the main road to the outer edge of the building's land. The pedestrian path's condition on the road's east side can be seen in the image below.

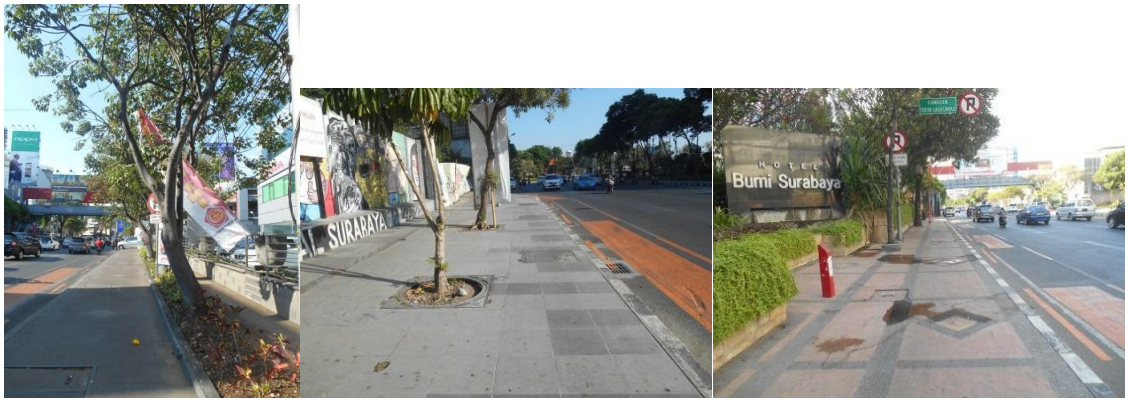

Figure 3. Sidewalk on the East and West Sides of the Road
(Source: Primary Survey, 2014)

Based on field observations, the type of sidewalk in the observation area has a consistent green/shaded path. The shade/green lane is along the pedestrian path. Furthermore, there are also types of arcade pedestrian spaces on the east and west sides of the road, as shown in the image below.

Figure 4. Arcade di Sisi Timur dan Barat Jalan
(Source: Primary Suvrey, 2014)

Pedestrian Space in Commercial/Office Areas (Arcade) is a pedestrian space adjoining a building on one or both sides. In the research area, the arcade pedestrian space adjoins the building on one side only and is located in a commercial area. This type is intermittent and has inconsistent green/shading paths. The length of the routes for these two typologies are:

Table 8. Pedestrian Path Typology

No.	Typology	Route Length
1.	*Sidewalk*	2084,43 meter (0,2 km)
2.	*Arcade*	197 meters (0,01 km).

Source: ArcGIS Calculation Results, 2014

An overview of the length and location of the two types of pedestrian paths can be seen in Figure 6. Pedestrian Path Typology Map

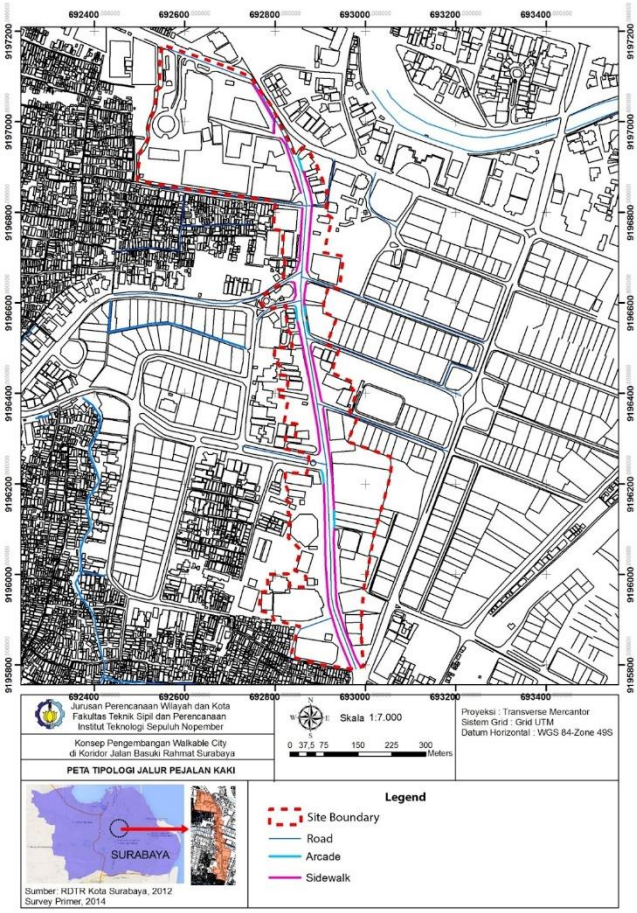

Figure 6. Pedestrian Path Typology Map
(Source: Primary Survey, 2014)

3.5. Condition Of The Basuki Rahmat Corridor Pedestrian Path

3.5.1. Physical Condition

A. Pedestrian Path Dimensions

The length of the pedestrian path in the study area is 2,230 meters. Meanwhile, the width of the lane varies from 3-4 meters.

Figure 7. Conditions of Pedestrian Path Width in the Study Area
Source: Primary Survey, 2014

B. Number and Condition of Pedestrian Path Facilities

a. Number and Condition of Pedestrian Signs/Signage

The signs on the pedestrian paths in the research area are quite numerous and informative. Signs such as no parking, special bicycle lanes, and no stopping greatly affect the comfort and safety of pedestrians.

Figure 8. Conditions of Signs on Observed Pedestrian Pathways
Source: Primary Survey, 2014

In addition to traffic signs, signs can also be in the form of advertisements. Billboards in the observation area are located in several locations with 4-5 billboard units/location points.

b. Number and Condition of Pedestrian Crossing Facilities

Crossing facilities available on the pedestrian path observed are zebra crossings and pedestrian bridges. The pedestrian bridges are located at 4 location points as shown in the Figure. Map of the Distribution of Pedestrian Path Facilities. Meanwhile, zebra crossing is located at 3 location points. One measure of the comfort and safety of a pedestrian facility is the length of time it takes to cross. Based on field observations, the length of time to cross in this area is <10 minutes with a pedestrian bridge, and 10 seconds with a zebra crossing using traffic control lights (Pelican Cross). This fact shows that pedestrians are safe enough to cross from one point to another. Meanwhile, the travel time to the crossing facility ranges from 3-4 minutes.

Figure 9. Condition of Crossing Facilities in Observed Pedestrian Pathways
Source: Primary Survey, 2014

c. Number and Lighting Conditions of Pedestrian Paths

Lighting in the observation area is in the form of LPJU (Public Street Lighting), with a distance of 20-30 meters between lights. The light model in the observation area is divided into 2, namely:

- Single pole lamp models are located along both sides of the Basuki Rahmat corridor
- The two-pronged pole lamp model is located in the median of the road

d. Number and Condition of Pedestrian Path Furniture

The pedestrian path furniture along the Jalan Basuki Rahmat Corridor is trash bins, seats and bus stops. Trash bins in the Jalan Basuki Rahmat Corridor are located along the East and West sides along the sidewalk, each trash bin being 50 meters apart. The trash can is divided into 2 (two) parts, namely the trash can for dry waste, with yellow color and the trash can for wet waste, with blue color. Along the Jalan Basuki Rahmat Corridor, there are

3 (three) bus stops, all of which have shelters on the sides. Meanwhile, there are only 2 location points for seating.

Figure 10. Garbage Bins, Bus Stops, and Seats in the Observation Area
Source: Primary Survey, 2014

The location points for the distribution of pedestrian pathway facilities can be seen in the figures. Meanwhile, below is the number of existing pedestrian walkway facilities in the observation area:

Table 9. Number of Pedestrian Path Facility Units

No.	Pedestrian Path Facilities	Quantity
1.	Signage	
	Traffic signs	
	• No parking/stopping	21
	• Bike Lane	4
	Reclame	
2.	Crossing Path	
	Zebra Cross	4
	Bridge	4
3.	Lighting	
	LPJU (Public Street Lighting)	57
	Traffic lights	1
4.	Outdoor Furniture	
	Trash bin	19
	Bench	2
	Bus Stop	4

Source: Primary Survey, 2014

C. Vegetation Variations and Conditions Along the Walking Path

The green belt model in the observation area is divided into two, namely plants in permanent pots and single-shade trees lined up along the pedestrian path so that the sidewalks are not used for street vendors. The types of plants in the observation area varied, namely argsana, king palm, cape, and bamboo (Department of Public Works, 2006).

Figure 11. Model Jalur Hijau di Wilayah Pengamatan
Sumber: Survey Primer, 2014

3.5.2. Non-Physical Condition

A. Conditions of Social Interaction Along the Pedestrian Path

Social interactions that occur in the research area occur because there is space for people to communicate. Facilities such as restaurants/cafes are a strong attraction for people to interact. In addition, street vendors (PKL) selling at several points on the pedestrian path are a special attraction for pedestrians/non-pedestrians to interact with each other. Based on field observations, other social interactions occur at night, especially on Saturdays. This sidewalk is used for the gathering of motorcycle groups which are quite a lot in number and occupy almost the entire sidewalk along Jalan Basuki Rahmat Corridor.

B. Interesting Activities Along the Walking Path

- Frequency of Visits to Shopping Centers

Tunjungan Plaza I-IV, a commercial center in Surabaya, is a special attraction for the community. This shopping center, with an area of 125,000 m^2, can accommodate 78,125 people based on the common human movement space of 1.6 m^2/person.

- Frequency of Park Visits

C. Visual Sights Along the Pedestrian Path

Based on field observations, the visual sights in the research area are vegetation, murals, lights, sidewalk designs, and billboards. Apart from being a visual aspect of the city, lights, vegetation and billboards also function as facilities for the pedestrian paths discussed above. Explanations regarding murals and sidewalk designs can be seen in the following table:

Table 10. Visualization in the Observation Area

No.	Pedestrian Path Facilities	Remark
1.	Mural	As one aspect of city visualization, the mural can be a special attraction for pedestrians. In the existing condition, the murals are only found on several sides of the building
2.	Sidewalk Design	The sidewalk design looks dynamic with the material from pattern concrete and the provision of motifs and colors.

Source: Primary Survey, 2014

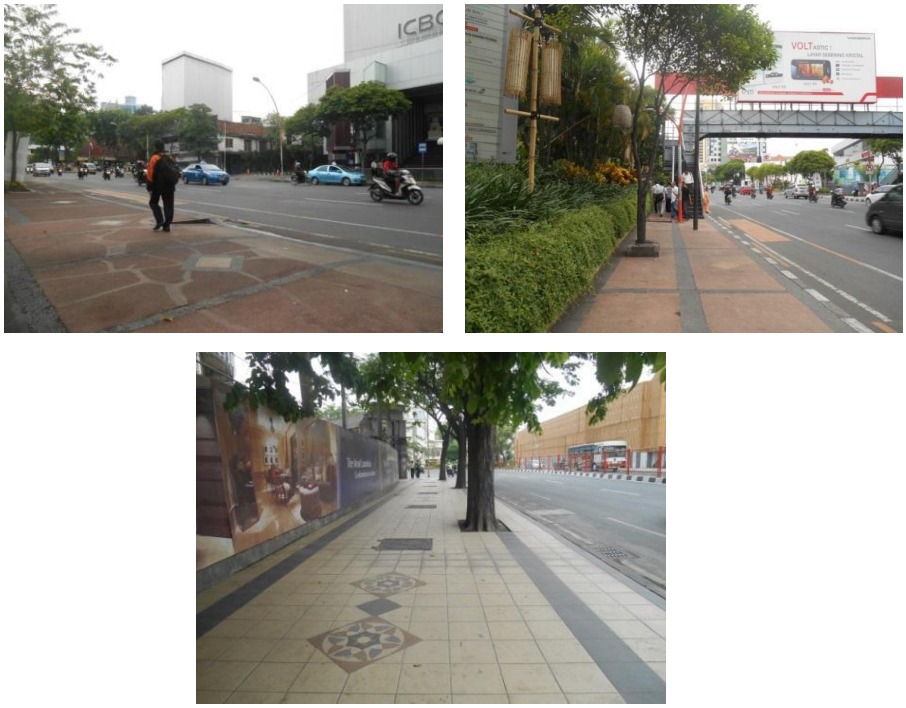

Figure 12, Sidewalk Design in Observation Area
Source: Primary Survey, 2014

Figure 13. Murals in the Observation Area
Source: Primary Survey, 2014

A. Conditions of Transportation Along the Pedestrian Path
   a. Availability of Public Transportation Modes

Modes of public transportation that pass through this corridor consist of MPU, buses, and taxis.

Table 10. Types of Transportation Modes in the Observation Area

No.	Types of Public Transportation Modes	Remark
1.	Bus	Damri : Perak-Bungurasih

2.	MPU	• Lyn V coklat : Krampung-Joyoboyo • Lyn RT ijo : Rungkut-Bratang-Pasar Turi • Lyn E ijo : Balungsari-Tidar-Karang Menjangan • Lyn DA kuning : JMP-Pasar Atum • Lyn W ijo toska : Karang Menjangan
3.	Taxi	

Source: Primary Survey, 2014

MPU, which has several routes, is the most widely used public transportation.

Figure 14. Public Transportation Modes in the Observation Area
Source: Primary Survey, 2014

b. Number of Crossroads

There are nine crossroads points in the observation area. Based on the literature and initial hypotheses, this will affect pedestrian accessibility because, with an intersection, the continuity of pedestrian circulation will be disrupted.

c. Ease of Access to Public Transportation Stop Locations

The table below is a description of the evaluation of each of the variables that have been discussed:

Table 11. Evaluation of Overview Variables

Indicator	**New Urbanism Theory**	**Existing Condition**	**Evaluation**
Existence of crossing facilities	A distance of 400 meters in accordance with the ability of Indonesians to walk	There are 4 units with a distance of about 400 meters between facilities	Required maintenance of pedestrian bridge buildings to improve safety for pedestrians
Availability of signs and lighting	· Signs are placed on the side of the road without blocking pedestrians · There are special pedestrian lights	· Signs vary according to function and are located on the side of the road · Lighting is sufficient with street lights, but not sufficient for pedestrians	· The number and location of markings are in accordance with the characteristics of the corridor · It is necessary to add special pedestrian lights in the future

The physical condition of the pedestrian path	The width of the sidewalk must be 1.8-3 meters	The effective width of the sidewalk is approximately 3 meters	The width of the sidewalk is sufficient but the physical condition needs to be improved
Social interaction	With the pedestrian path, it is hoped that there will be social interaction between pedestrians	The social interaction that occurs is due to the existence of a motorcycle community that utilizes pedestrian paths on weekends	It is necessary to add adequate sidewalk furniture so that natural social interaction occurs in the study area
Interesting activity	Interesting activity is one of the attractions for pedestrians	The study area is a CBD area so that most of its activities are commercial activities which are the main attraction of this corridor	Additional activities are needed in the study area to revive the Jalan Basuki Rahmat corridor so that it becomes a walkable corridor
Visual view	Visualization on the pedestrian path is needed to attract the interest of pedestrians in carrying out walking activities	The visual sights in the study area include graffiti and decorative street lights	It is necessary to add an interesting visualization in accordance with the characteristics of the corridor so that it becomes a walkable corridor
Availability of public transportation modes	The mode of transportation as an element of connectivity is needed in connecting the nodes of the movement of pedestrians	Public transportation modes in the study area are sufficient, but have not fully become a tool for pedestrians because pedestrian movement is uneven	It is necessary to add bus stops for city transportation to make it easier for pedestrians to access modes of transportation such as lyns, buses and others.
Continuity and accessibility of pedestrian paths	Areas that are walkable need continuity so as to create an integrated environment	Pedestrian paths in the study area as a whole have not been properly integrated because the physical condition of the sidewalks has not fully met the standards	Physical repair of damaged sidewalks is required

Land use (Commercial Area)	Mixed land use is one of the important principles in cultivating walking activities because with varied land uses pedestrians can easily access any activity.	Most of the land use in the study area is in the form of trade and service land, but the existence of settlements around the CBD area also shows that mixed-land use greatly affects the level of pedestrian movement.	It is necessary to add interesting activities so that walking activities increase

Source: Analysis, 2015

3.6. The Concept Of Micro-Development

Then, the Narrative process is carried out to formulate the concept of developing a walkable city. Based on the analysis results, appropriate development concepts are divided into 2, namely macro and micro development concepts. This is because the analysis of the previous target measures general and specific/detailed things, so it is necessary to distinguish between overall concepts and specific/complex concepts. The concept of macro development in this study is to develop a corridor on Jalan Basuki Rahmat into a walkable and humane corridor. The macro concept can be seen in the table below:

Table 12. The Concept of Micro-Development of the Research Area

No.	LOS	Remark	Micro Concept Criteria	Concept Formulation Analysis
1	F	-Pedestrians walk at a plodding and restricted flow speed -It is not comfortable, and it is not following the pedestrian space capacity -The value of pedestrian space is 0.11 m2/pedestrian.	Physical Condition of the Pedestrian Path	Need to add/widen pedestrian space; sidewalk free of motorized vehicles. One way to increase the width of the sidewalk is by enacting incentive-disincentive policies for buildings that have the potential to provide more space for the sidewalk in front of them. For the pavement, the material can be selected based on its durability, while the motifs and colors need to be adjusted to add to the attractiveness.

2	E	-Pedestrians have the same speed -Beginning to be uncomfortable to walk on but still a lower threshold of pedestrian space design capacity -Pedestrian space value is 0.85 m2/pejalan kaki.	Special lane for disabled people	Improve the existing special lanes for the disabled by increasing the length of the paths
			Green open space	Choose and multiply a variety of shade trees that absorb pollutants, do not damage utility networks, and are aesthetically pleasing to the eye
3	**B**	-Pedestrians can still walk comfortably and quickly -The presence of other pedestrians has begun to affect the flow of pedestrians -The value of pedestrian space is 5.45-6.22 m2/pedestrian.	Pedestrian facilities	-Conduct an Amdal study to determine the number of tokens needed according to the characteristics of the corridor. -Considering seating requirements based on corridor characteristics and integrating with other street furniture elements. -Build special lighting for pedestrians. Increase the number of trash cans according to the volume of pedestrians

4	**A**	-Pedestrians walk freely and determine their direction freely -Relatively fast speed without causing interference between pedestrians -Pedestrian space value is 15 m2/pedestrian.	Activity Improvement	Increased activities related to mixed land use in the study area. The more varied the land use, the easier the walkable concept will be. In addition, connectivity is also an essential element in supporting walking activities. One way to improve activities with elements of connectivity is to differentiate the timing of public transport and private vehicles to avoid congestion of vehicles during rush hour. Tram and monorail planning for the future can also be used to increase the accessibility for pedestrians

Source: Analysis, 2014

4. Conclusions

Based on the analysis above, it can be concluded that Basuki Rahmat Corridor needs improvements. The first is the required maintenance of pedestrian bridge buildings to improve pedestrian safety. Then, the number and location of markings should follow the characteristics of the corridor. It is also necessary to add unique pedestrian lights in the future. Physically, the width of the sidewalk is sufficient, but the physical condition needs to be improved. It is necessary to add adequate sidewalk furniture so that natural social interaction occurs in the study area.

From the non-physical elements, additional activities are needed in the study area to revive the Jalan Basuki Rahmat corridor to become a walkable corridor. Additionally, it is necessary to add an exciting visualization under the characteristics of the corridor so that it becomes a walkable corridor. From a connectivity perspective, it is necessary to add bus stops for city transportation to make it easier for pedestrians to access modes of transportation such as lyns, buses and others. Overall, the researcher discovered that Basuki Rahmat Corridor has an enormous potential to be a walkable area if the facilities are improved. The land use environment has already given a lively vibe because of the various activities offered, yet the stakeholders still need to be concerned with the sustainability of the corridor.

Then, from the results, a micro concept is obtained, further divided into spatial and non-spatial concepts. Spatially, the idea references earthly space where the various walkability criteria are in multiple spatial units in terms of spatial planning, which are directly related to the arrangement of elements of pedestrian pathway facilities. Meanwhile, non-spatial concepts discuss essential matters that indirectly affect the walkability concept, such as primary education, changes in the mindset of pedestrians, and discipline regarding existing traffic signs.

The non-spatial concept has to do with basic things that indirectly affect the concept of walkability. For the concept of non-spatial micro development, several things are needed as follows:

- Proclaimed basic education regarding:

    - The importance of walking as a good mode of public transportation
    - How to survive living in urban areas
- Obey traffic signs and how to use existing pedestrian facilities
- Increase the discipline of residents in terms of crossing by getting used to complying with existing rules
- Familiarize residents, especially pedestrians, to be disciplined in disposing of trash by not providing extra trash facilities
- Train pedestrians to be disciplined in terms of time management by providing adequate crossing and bus stop facilities

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