

PLACEMAKING IN TANAH ABANG: BETWEEN DIMENSIONS AND INTENSITY OF PEDESTRIAN WAYS

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ABSTRACT

Placemaking in pedestrian ways of a commercial area has its own characteristics, especially between central mode of transportation and shopping center. The area between Tanah Abang Station and "Blok A" Tanah Abang Market is bustling with variety of activities, especially temporary commercial activities by street vendors and hawkers as a form of placemaking. This paper explores the relationship between road dimensions and pedestrian intensity of placemaking that occurs along the pedestrian ways between the station and Blok A of The Market. The research method used is mixed method of quantitative data processing and qualitative analysis. Variables used include the dimensions of the pedestrian ways and pedestrian intensity on the path. Pedestrian ways' dimensions cover the width and length of the pathway. Pedestrian intensity is measured by the amount, speed, and space of the pedestrian. Case studies include pedestrian ways on four streets, namely the Streets of Jatibaru Raya, Kebon Jati, Jatibaru 2, and Jatibaru 10. The results of the study show that all four streets have similar placemaking although they differ in dimensions and intensity. This shows the relationship between the dimensions of the road with the intensity of the road and it does affect the formation of place/placemaking. The narrower the width of the road and the shorter the

length of the road, the higher the intensity of pedestrians, which is an indicator of the formation of placemaking in the pedestrian ways of Tanah Abang.

Keywords: pedestrian way dimensions, pedestrian intensity, placemaking

INTRODUCTION

Each place has its own uniqueness that is very influential on the surrounding social environment (Gustafson, 2001). Placemaking can be created from organic processes through community groups termed tactical placemaking which can take the form of markets (Cohen, M. Gajendran, T. Lloyd, J. Maund, K. Smith, C. Bhim, S. and Vaughan, n.d.). In a place there are values and meanings that are not possessed by space, therefore the placemaking approach is deemed necessary in planning a space to function according to the needs of its users.

The success of placemaking is influenced by access and linkage, comfort, image, functions and activities, and social abilities (Nouri. AS; Costa' JP., 2017). Successful placemaking is a lively and routinely utilised by users from time to time. This study explores the variable dimensions of the path and pedestrian intensity that are part of the elements of access and linkage as well as functions and activities. Some previous studies

have explored the link between placemaking, and pedestrian path dimensions related to privatization (Winandari MIR.; Wijayanto P.; Jefri A., 2019; Wahyuni S, 2018) and pedestrian intensity (Andini, DN, Mutia, 2016; Hanan, 2012).

Pedestrian ways as an important part in urban areas have a function as a link between areas, buildings, or facilities. One of the various attributes of pedestrian ways to achieve pedestrian safety and comfort is the dimension of pedestrian pathways (Wahyuni S, 2018; Nouri. AS; Costa' JP., 2017). The dimensions of the pedestrian pathways can form a pedestrian character and become one of the pedestrian-friendly indicators. Referring to Miro. F. (2011), the character of pedestrians is determined by the number of pedestrians, pedestrian speed, and pedestrian space. The number of pedestrians affects the pedestrian speed as it passes and the space between pedestrians. The success of the pedestrian pathway can be seen from the intensity of daily pedestrians.

Regarding the dimensions of the road, the width of the sidewalk must be able to serve the volume of existing pedestrians (Royke L., 2015). Based on NJDOT (New Jersey Department of Transportation), 1996), pedestrian path width of at least 1.5m excluding curb width and vertical clearance as high as 2m. Furthermore, NACTO (2013) states that pedestrian lines that are convenient for pedestrians in the downtown area or commercial area are 2.5m-4m. The width is considered safe and comfortable for pedestrians and people with disabilities to move around. The minimum pedestrian space based on Permen PU No. 03/PRT/M/2014 is 0.36 m² without any hand-carry and in stationary conditions, 1.08 m² without any hand-carry and in moving conditions, and

1.44 m² with hand-carry and in a moving condition.

Good sidewalk planning must pay attention to the freedom of walking speed to overtake and cross paths with other pedestrians without contact (Royke L., 2015). Referring to Harris CW & Dines NT. (1998), the average amount of pedestrian flow is 16-23 org/m/min with an average pedestrian speed of 54-60 m/min, and the average pedestrian space of 1, 4-2.3 m². This number is a standard value that is interconnected.

Stonor T. (2019) states that the essence of intensity is the existence of economic, social, cultural, intellectual, or factual exchange. Referring to Nasrudin. N; Sarimin. M. & Ibrahim. N.(2018), the reduction in width of the road due to vendor activity impedes movement of pedestrians. This is explained by (Stonor T. (2019) that the intensity of activities on the road will be higher if the road space is narrowed but the pedestrian path is widened so that people can sit and interact. On the other hand, Winandari MIR.; Wijayanto P. & Jefri A., (2019) show that the width narrowing of the road caused by placing items around settlements does not hinder any comforts of activities.

This paper's objective is to get the relationship between dimensions and intensity of pedestrians of placemaking in Tanah Abang's pedestrian ways. This area is a commercial area that is always crowded every day. Pedestrian ways users in this area are generally commuters between Tanah Abang Station and Tanah Abang Market Blok A, B, and F. Pedestrian ways in this area are not only used for pedestrian circulation paths but also for trading by shops and street vendors. The physical condition of the pedestrian path in the Tanah Abang area is also affected by commercial activities

that take place in the pedestrian pathway such as the presence of shop traders and street vendors occupying both sides of the pedestrian path hence the dimensions of the pedestrian path experience changes.

METHODS

The research method used is mixed method with quantitative data processing and qualitative analysis (Day, JK. Gunderson, 2018). Case studies cover pedestrian ways on four streets, namely Jatibaru Raya, Kebon Jati, Jatibaru 2, and Jatibaru 10 Streets. Road Variables used are the dimensions of the pedestrian ways and pedestrian intensity on the path. Pedestrian way dimensions cover the width and length of the path. Pedestrian intensity is measured by the amount, speed, and space of the pedestrian. Pedestrian intensity is determined from pedestrian flow, pedestrian speed, pedestrian density, and pedestrian space (Artawan, A. Wedagama, DMP. Mataram, 2013). The calculation of the intensity of pedestrians includes the number of pedestrians in units of people/meters/minute (p/m/m), pedestrian speeds in units of minutes/meters (m/m), and the space for pedestrians in square meters/people (m^2/p). Observation of pedestrian intensity is carried out for a week with three periods of time, at 08.00-10.00 WIB, 12.00-14.00 WIB, and 16.00-18.00 WIB. Interviews were conducted with visitors and traders along the road.

RESULTS AND DISCUSSION

Tanah Abang is a commercial area with the largest wholesale market in Southeast Asia and the most populous station in Indonesia. A total of 73,413 people crowds the Tanah Abang KRL (commuter train) station every day (Zainuddin HA., 2018) which affected the density of

pedestrian lines around the station area. Case studies in four streets of Jatibaru Raya, Kebon Jati, Jatibaru 2, and Jatibaru 10 Streets that formed into two travel routes. Route A is along 900 m route of Jatibaru Raya, and Kebon Jati Streets and route B is Jatibaru 2 alley, Jatibaru 10, and part of Kebon Jati Street along 870 m.



Case study

Fig.1. Case location

carried out on the four Streets mentioned. The discussion is grouped into the dimensions of the pedestrian path. Jatibaru Raya Sidewalk is the main sidewalk in Tanah Abang which is included in the main route series along with Kebon Jati sidewalk.

Dimension of Pedestrian Ways

Route A has a similar dimension to the sidewalk width of 5m with a path that can be crossed by pedestrians as wide as 1.5m - 2m due to the laying of goods by traders. Vertical sidewalk's free space is as high as 2.5m with a height difference of 20cm between the pedestrian lane and the traffic. There is a 1.5m high fence or 1m high concrete separator on the edge of the sidewalk. On Jatibaru Raya Street, shop vendors occupy the sidewalk along 2m in front of the building line while street vendors are along 1m - 1.5m. On Jalan Kebon Jati, both sides of the sidewalk as

wide as 1.5m - 2m are used by street vendors to trade. This disrupts the pedestrian rate and reduces pedestrian space.



Fig. 2. Dimensions of Route A

Like Route A, there is occupancy of the pedestrian path on Route B due to the street vendors settings. The width of the Jatibaru 2 and Jatibaru 10 Streets is approximately 5m without a pedestrian-only lane with shop building's terrace of a 90cm wide and a difference in height between the terrace of the shop and the road is as high as 10cm. Traders occupy 2 m wide sidewalks on both sides of the road, leaving only a 1.5m - 2m wide crossing space. Vertical free space as high as 2.5 m without difference in height of the vehicle lane and pedestrian lane. Trade activities on both sides of the road led to narrower pedestrian lanes and more limited space for movement.



Fig. 3. Dimensions of Route B



Fig. 4. Pedestrian ways in Jatibaru 2 and Jatibaru 10

Pedestrian Intensity

The highest number of pedestrians in a day (08.00 - 18.00 WIB) takes place on Jatibaru Raya Street and the lowest on Jatibaru 2 Street. Pedestrian busy days on the four pedestrian lines occur on weekends, Saturday and Sunday. On Jatibaru Raya Street, the highest number reaches 53 p/m/m that occurred on Saturday, on the Kebon Jati sidewalk the highest number of 34 p/m/m occurred on Tuesday, in Jatibaru 2 alley the highest number of 31 p/m/m occurred on Sunday, and in the Jatibaru 10 alley the highest number of 44 occurred on Sunday.

The average number of pedestrians in one week shows that the busy time is at 12.00 - 14.00 WIB. Jatibaru Raya Street is busy at 12.00 - 14.00 WIB at 45 p/m/m, Kebon Jati Street is busy at 12.00 - 14.00 WIB and 16.00 - 18.00 WIB at 30 p/m/m, Jatibaru 2 Street is busy at 12.00 - 14.00 WIB is 28 p/m/m, and Jatibaru 10 Street is busy at 12.00 - 14.00 WIB, with 32 p/m/m. The results of the calculation of the average number of pedestrians for one week shows the order of density of pedestrians. Jalan Jatibaru Raya is the most populous section with 42 p/m/m pedestrians, followed by Jatibaru 10 Street with 30 p/m/m, Kebon Jati Street with 29 p/m/m, and Jatibaru 2 Street with 25p/m/m (see Table 1 & Fig. 5).

Table 1. Pedestrian Flow Volume

DAY	HOUR	PEDESTRIAN FLOW VOLUME (person/m/mnt)				AVERAGE
		JLN. JATIBARU RAYA	JLN. KEBON JATI	JLN. JATIBARU 2	JLN. JATIBARU 10	
MONDAY	08.00-18.00 WIB	45	32	24	31	33
TUESDAY	08.00-18.00 WIB	47	34	26	22	32
WEDNESDAY	08.00-18.00 WIB	44	24	19	23	28
THURSDAY	08.00-18.00 WIB	18	28	27	30	26
FRIDAY	08.00-18.00 WIB	34	26	24	21	26
SATURDAY	08.00-18.00 WIB	53	29	24	40	37
SUNDAY	08.00-18.00 WIB	51	30	31	44	39
AVERAGE NUMBER		42	29	25	30	

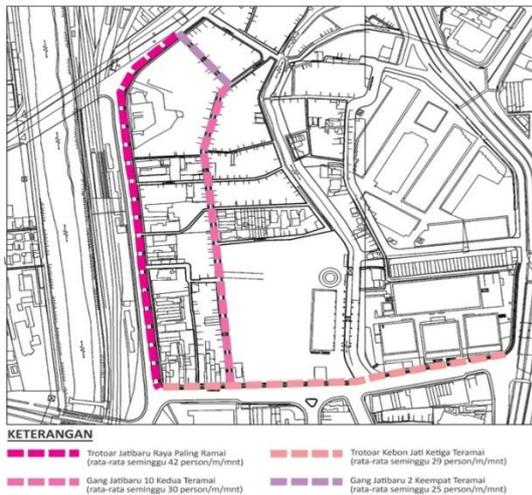


Fig. 5. Pedestrian Number Map

Calculation of the average pedestrian speed shows that the highest speed occurs at 08.00 - 10.00 WIB and the lowest at 12.00 - 14.00 WIB. The highest speed took place on Kebon Jati Street at

65 m/minute, followed by Jatibaru 10 Street at 53.2 m/min, Jatibaru 2 Street at 51.4 m/min, and Jatibaru Raya Street at 40.2 m/min. Friday is the day with the highest pedestrian speed on Jatibaru Raya Street at 55.7 m/min, Kebon Jati Street at 70.7 m/min, Jatibaru 2 Street at 55.3 m/min, and Jatibaru 10 Street at 69, 3 m/min (see Table 2 & Fig.6).

Table 2. Pedestrian Walking Speed

DAY	HOUR	PEDESTRIAN WALKING SPEED (m/mnt)				AVERAGE
		JLN. JATIBARU RAYA	JLN. KEBON JATI	JLN. JATIBARU 2	JLN. JATIBARU 10	
MONDAY	08.00-18.00 WIB	40.0	68.0	50.3	51.7	52.5
TUESDAY	08.00-18.00 WIB	38.7	60.0	50.0	54.0	50.7
WEDNESDAY	08.00-18.00 WIB	39.3	66.3	60.7	59.3	56.4
THURSDAY	08.00-18.00 WIB	39.0	63.0	46.7	48.7	49.3
FRIDAY	08.00-18.00 WIB	55.7	70.7	55.3	69.3	62.8
SATURDAY	08.00-18.00 WIB	35.0	62.3	46.7	48.0	48.0
SUNDAY	08.00-18.00 WIB	34.0	64.7	50.3	41.7	47.7
AVERAGE NUMBER		40.2	65.0	51.4	53.2	

The average pedestrian speed in three time periods in one week shows that the highest pedestrian speed in Jatibaru Raya Street is at 08.00 - 10.00 WIB at 45.3 m/minute, in Kebon Jati Street at 08.00 - 10.00 WIB at 67.4 m/minute, in Jatibaru 2 Street at 16.00 - 18.00 WIB at 53.3 m/minute, and at Jatibaru 10 Street at 08.00 - 10.00 WIB at 57.3 m/minute.

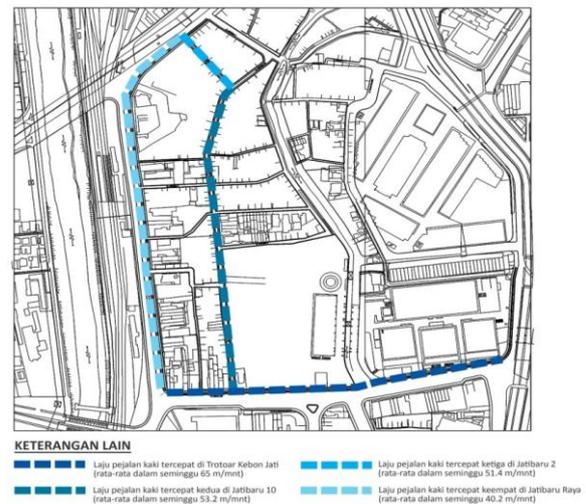


Fig. 6. Walking Speed Map

Calculation of the average daily space shows that Kebon Jati Street is a pedestrian path with the widest range of

space, 1.12 m²/person followed by Jatibaru Street at 1.11 m²/person. Both Streets meet a minimum area without hand-carry (Permen PU No. 03/2014). The space for the other two Streets; Jatibaru Raya Street is 1.04 m²/person and Jatibaru 10 Street is 1.07 m²/person. Referring to Permen PU No. 03/2014, the four roads do not meet the minimum space needed for pedestrians in commercial areas when carrying luggage.

Based on the time period, the narrowest space to take place at 08.00 - 10:00 WIB on Jatibaru Raya Street at 1.02 m²/person. The other narrowest space on Kebon Street takes place at 12.00 - 14.00 WIB at 1.05m² person, at Jatibaru 2 Street at 08.00 - 10.00 WIB at 1.08 m²/person, and at Jatibaru 10 Street at 12.00 - 14.00 WIB with the number of 1.06 m²/person.

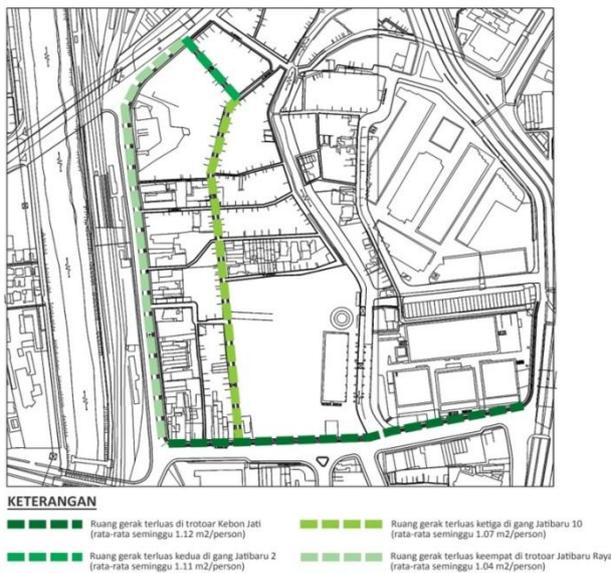


Fig. 7. Pedestrian Space Map

Table 3. Pedestrian Intensity

PEDESTRIAN INTENSITY	JATIBARU RAYA	KEBON JATI	JATIBARU 2	JATIBARU 10
Pedestrian Flow Volume (p/m/mnt)	42	29	25	30
Pedestrian Walking Speed (m/mnt)	40.2	65	51.4	53.2
Pedestrian Area Occupancy (m ² /p)	1.04	1.12	1.11	1.07

The four road Streets shows that all four did not meet normal standards in the commercial area (see Table 3). The number of pedestrians on the four Streets above the normal number is greater than 23 person/meter/minute. One of the four roads namely Kebon Jati Street has the pedestrian speed above the ideal is 65 m/min while the three other roads below the ideal (Harris and Dines, 1998). Based on the space for pedestrians in the area commercially, the four roads do not meet the ideal number of 1.44 m²/person (Permen PUNo. 03/2014).

Based on the route between the Tanah Abang KRL Station and the Tanah Abang Market there are 2 routes. Route A is Jatibaru Raya Street and Kebon Jati Street along 900m, and route B is Jatibaru 2 Street, Jatibaru 10 Street, and Kebon Jati Street along 870m. Both routes have a 30m distance difference. Calculation of intensity on both routes shows that the two routes do not meet the ideal value of pedestrian intensity. Route A has a pedestrian number of 71 people/m/minute, pedestrian speed of 52.6 m/minute, and pedestrian space of 1.07 m²/person. Route B has a pedestrian number of 78 people/m/min, pedestrian speeds of 52.2 m / min, and pedestrian space of 1.02 m²/person.

Table 4. Pedestrian Intensity based on Route

PEDESTRIAN INTENSITY	ROUTE A	ROUTE B
Pedestrian Flow Volume (p/m/mnt)	71	78
Pedestrian Walking Speed (m/mnt)	52.6	52.2
Pedestrian Area Occupancy (m ² /p)	1.07	1.02

Table 4 shows that the intensity of the route B pedestrians is higher than of route A. Route B has a greater number of pedestrians, higher pedestrian speeds, and lesser pedestrian space than route A.

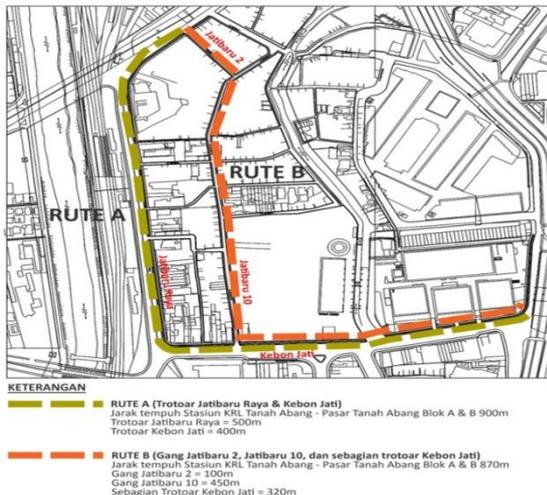


Fig. 8. Intensity Map based on Route

Relationship Between Dimension of Pedestrian Ways & Pedestrian Intensity

The four Streets that were the case studies showed that the dimensions of the road had met the ideal standard. All four have an ideal road width of 5m, vertical free space as high as 2.5m, and the difference between a vehicle lane and a pedestrian lane as high as 20cm ; (Harris CW; Dines NT., 1998; Peraturan Menteri Peraturan Menteri Pekerjaan Umum tentang Pedoman Perencanaan, Penyediaan, dan Pemanfaatan Prasarana dan Sarana Jaringan Pejalan Kaki di Kawasan Perkotaan., 2014). Commercial activity on the four Streets caused a narrowing of the pedestrian path to the remaining 1.5m - 2m. The narrowing of the path affects the intensity of pedestrians. Intensity results in the case study show the high intensity of pedestrians on the four Streets caused by the number of pedestrians, pedestrian speeds, and pedestrian movements that are not ideal (see Table 5). This reinforces

the statement of Stonor T. (2019) about trading activities as one of the cores of the high intensity of pedestrians. The high intensity is inversely proportional to the level of comfort of pedestrians. Pedestrians feel more comfortable if there are no trading activities on the road, although some of them consider these activities more practical. This reinforces the results of research by Pohan HGM.; Manullang OR. (2018), Wahyuni S (2018) and Nouri. AS; Costa JP (2017) on road dimensions that affect pedestrian comfort.

Table 5. Intensity Assessment

PEDESTRIAN INTENSITY	PEDESTRIAN INTENSITY STANDARDS	AVERAGE CALCULATED OF 4 PEDESTRIAN WAYS	ASSESSMENT
Pedestrian Flow Volume (p/m/mnt)	16-23	32	> 16-23
Pedestrian Walking Speed (m/mnt)	56-60	52.45	< 56-60
Pedestrian Area Occupancy (m ² /p)	1.44	1.085	< 1.44

CONCLUSIONS

The four case studies in the Tanah Abang area show differences in pedestrian dimensions and intensity but have similar characteristics in placemaking in a form of the narrowing of pedestrian trajectory width. The condition was caused by the occupancy of pedestrian routes through the street vendors settings by shop owners and street vendors. The high number of pedestrians at 32 people/m/minute causes the speed of pedestrians to be slower at 52.45 m/minute, which affects pedestrian space to 1,085 m²/person. The area of motion is included in the group is not ideal if walking with groceries, but still ideal if crossing without carrying luggage. The results of the study reinforce the connection between the dimensions of the pedestrian way and pedestrian intensity. Route B which has a shorter road length than Route A has higher pedestrian

intensity even though the dimensions of the two routes are similar. The narrower the width of the pedestrian path and the shorter the length of the road which affects the distance of pedestrians, the higher the intensity of pedestrians. The high intensity of these pedestrians is an indication of the creation of placemaking in the Tanah Abang area pedestrian path

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