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Submission date: 28-Apr-2024 08:58PM (UTC-0500)
Submission ID: 2364849522
File name: JTIE_Vol.3_No.1_April_2024_Hal_44-60_1.pdf (556.32K)
Word count: 6049
Character count: 28433

Journal of Technology Informatics and Engineering
Vol 3 No 1 April 2024
e-ISSN :2961-8215;.p-ISSN :2961-9068 Page 44 - 59
DOI: https://doi.org/10.51903/jtie.v3i1.160

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Abstract: *Many pedestrian paths are still not well organized and optimally utilized. On the other hand, the comfort of pedestrian paths should be a priority in urban transportation planning. This study aims to determine the level of pedestrian service on Jl. Istana and Jl. H. Agus Salim Bukittinggi city and to determine the perceptions of people who use pedestrian crossing facilities on Jl. Istana and Jl. H. Agus Salim in the Bung Hatta Palace area of Bukittinggi based on comfort and level of pedestrian service. This research uses descriptive research methods carried out to explain the situation that occurs on the pedestrian path Jl. Istana and Jl. H. Agus Salim in the Bung Hatta Palace area of Bukittinggi . For the results of pedestrian movement characteristics obtained data Flow (Flow) in segment I amounted to 0.12, 0.70 and 0.75 pedestrians / min, in segment II amounted to 0.29, 1.13 and 1.67 pedestrians / min. Speed data in segment I was found to be 52.32, 55.97 and 54.97 m/min, in segment II it was 55.03, 51.74 and 53.96 m/min. Density in segment I was 0.18, 0.19 and 0.18 m2/ped, in segment II it was 0.62, 0.57 and 0.60 m2/ped. Space in segment I was 5.65, 5.38 and 5.50 m2/ped, segment II was 1.62, 1.74 and 1.67 m2/ped. Pedestrian ratio in segment I amounted to 0.0016, 0.0094 and 0.0100, segment II amounted to 0.00380, 0.01509 and 0.02227. The results showed that the level of pedestrian service on Jl. Istana and Jl. H. Agus Salim in the Bung Hatta Palace area Bukittinggi is A, because pedestrians can move freely according to their wishes without any interference from other pedestrians and for the results of the questionnaire that has been distributed as many as 100 respondents obtained a comfort value of 72% and this figure is included in the comfortable category.*

Keywords: *Pedestrian Path, Level of Service, Comfort*

INTRODUCTION

As one of the cities in the West Sumatra region, Bukit Tinggi City is one of the centers of economy, education, and as a city that encourages increased possibilities throughout the West Sumatra region, including rural, plantation and modern areas. As well as one of the doors to the travel industry in West Sumatra. Based on data from the West Sumatra Regional Focal Measuring Agency, the population of Bukittinggi City is In 2023 there will be 122,311.00 people with an area of 25.24 km² (BPS Bukittinggi City , 2023) .

Pedestrian paths are a means for pedestrians to carry out community activities to move from one location to another. On *pedestrian paths* it will increase the quantity of pedestrians. According to (Agustapraja, et al. 2018) , urban open space functions partly as a place for human activity, as a transition space for moving from one building to another or from one place to

Received March 31, 2024; Accepted April 27 , 2024; Published April 30 , 2024
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another. According to (Agustapraja 2018) , pedestrian paths are an important element of city design. Pedestrian space in a city context can play an important role in creating a humane environment. Pedestrians are people who move in one space on foot. Everyone is a pedestrian, even motorized vehicles are pedestrians who can move from other vehicles to go to another place or vice versa.

Pedestrian itself comes from the Greek word *pedos* which means foot, *pedestrian* also comes from the Latin word *pedester-pedestris,* namely someone who walks or pedestrian. So *pedestrian* in this case means the movement or movement of people from one place to another as a destination using the pedestrian mode (Mantik, VG, et al. 2015) .

In cities big currently growing pedestrians are increasing increase especially in the regions offices and centers tourist always crowded visited . However thereby Lots track *pedestrians* are still there Not yet organized neat and usable optimally . Then the city Bukittinggi through the Bukittinggi City Public Works and Spatial Planning (PUPR) Department has focus For enhancement track *pedestrians* in several areas of the city Bukittinggi .

Convenience track pedestrians must be used priority in planning transportation urban . Development track good *pedestrian* in accordance urban regional planning specifically pedestrians on the path general will increase convenience and quantity pedestrian afoot and quality environment urban .

The most interesting thing is that city Bukittinggi especially on the Jl. Palace and Jl. H. Agus Salim in the Bung Hatta Palace area , Bukittinggi there is various conflict for *pedestrians* and there are track *pedestrians* are used as place selling so that No works as it should be . The sidewalks are filled trees , which can hinder smoothness circulation pedestrian . Apart from that, Jl. The palace is road dense locale A passing vehicles and transportation general ups and downs passengers , so can dangerous for pedestrians who move along it road especially Jl. Palace and Jl. H. Agus Salim in the Bung Hatta Palace area , Bukittinggi .

For creation comfortable area for pedestrians , it must be fulfilled level service *pedestrian* especially in the Bung Hatta Palace area , Bukittinggi because it's in the area the crowded visited pedestrian . With more people do it Very exciting activity influence to level service on Jl. Palace and Jl. H. Agus Salim in the Bung Hatta Palace area , Bukittinggi . Viewed from reality above , interesting For analyze comfort and level service trail pedestrians *pedestrians* on Jl. Palace seen from perception user . This is the reason why researcher encouraged For do research entitled " Analysis Comfort and Service Level Pedestrians Against Utilization of *Pedestrian* Paths on Jl. Bukittinggi City Palace “ .

STUDY OF LITERATURE

Pedest r ian

Pedestrian is a pedestrian path that is generally parallel to the axis of the road and higher than the surface of the road pavement with the aim of pedestrian safety. *Pedestrian* itself is usually called by our own society a sidewalk, Pedestrian. Derived from Greek, namely pedos (foot) *pedestrian* also comes from Latin *pedester-pedestrian* is a pedestrian.

Pedestrian characteristics

According to (Artawan, Wedagama, and Mataram 2013) , using the Mannering and Kilareski formula, a pedestrian is anyone who walks in the road traffic space. The characteristics of pedestrian movement are divided as follows.

a. Pedestrian flow feet are amount pedestrians crossing a point on a segment sidewalk And in measuring in unit journey foot per meters per minute. Look for currentuse the following formula:

$$Q = \frac{N}{T} \quad \text{.....(2.1)}$$

Where :

Q = pedestrian flow (org/m/min).

N = number of pedestrians passing (org/m).

T = observation time (min).

b Speed is distance Which taken by pedestrian foot on something segment sidewalk per unit time certain. With the following formula:

$$V = \frac{L}{t} \quad \text{.....(2.2)}$$

Where :

V = Pedestrian speed (m/min) .

L = Length of observation section (m) .

t = Pedestrian travel time passing through the observation segment (min) .

c. Density is the amount pedestrian foot unity wide sidewalk certain. With formula as following:

$$D = \frac{Q}{Vs} \quad \text{.....(2.3)}$$

Where :

D = Density (org/m ^{2}).

Q = Flow (org/m/min).

Vs = Space average speed (m/min).

d. Room pedestrian is the average area available for each pedestrian feet on a sidewalk which is formulated in units of m^2 / person. With the formula as following:

$$S = \frac{Vs}{Q} = \frac{1}{D} \quad \text{.....(2.4)}$$

Where :

S = Pedestrian space (m^2 /person).

D = Density (org/m^2).

Q = Flow (org/m/min).

Vs = space average speed (m/min).

d. Ratio pedestrians are ratio And current with capacity pedestrian foot obtained ratiowith the following formula:

$$r = \frac{v}{c} \quad \text{.....(2.4)}$$

Where:

r = Pedestrian capacity flow ratio (org).

v = Pedestrian flow (pedestrian/min/m).

c = pedestrian capacity (pedestrian/m)

Analysis of Pedestrian Satisfaction Levels

To determine the level of respondent satisfaction by analyzing the data, it is necessary to determine the score results using the following steps.

- Make a tabulation of questionnaires from respondents.
- Determine the score of respondents' answers with the specified conditions. The questionnaire score determination is as follows.
- Each alternative answer to each question item is given a score according to the level of the alternative answer to the item.
- Each answer code is given a score in the form of a number on a scale of five, namely.

a Very Comfortable (SN) score 5.

b. Comfortable (N) score 4.

c. Quite Comfortable (CN) score 3.

d. Uncomfortable (TN) score 2

e. Very Uncomfortable score 1

- Add up the scores obtained from each respondent.
- Score percentage using formula.

$$\% = \frac{n}{N} \times 100\ \% \quad \text{.....(2.6)}$$

Where:

n = Total score of respondents (org).

N = Maximum number of scores (org).

quantitative results from the formula calculations are then changed or calculated using qualitative sentences. The steps taken to determine pedestrian comfort criteria are:

a. Determine the maximum score obtained from the product of the lowest score, number of items, number of respondents. The maximum pedestrian comfort level score is: 5 X 10 X 100 = 5000.

b. Determine the minimum score obtained from the product of the lowest score, number of items, number of respondents. The minimum pedestrian comfort level score is: 1 X 10 X 100 = 1000.

c. Determine the score range, namely between the maximum score minus the minimum score. The score range in question is: 5000-1000 = 4000.

d. Set class intervals. The class interval is obtained from the score range:

$$Interval\ Kelas = \frac{rentang\ skor}{jenjang\ kriterian} \ldots (2.7)$$

e. Set the maximum percentage, namely 100%.

f. Set a minimum percentage. The minimum percentage is obtained from the minimum score divided by the maximum score multiplied by 100%.

$$Persentase\ Minima\ \frac{skor\ minimal}{skor\ maksimal} 100\% \ldots\ldots (2.8)$$

g. Determine the percentage range, which is obtained from the maximum percentage minus the minimum percentage as follows.

Percentage range = max percentage–percentage

= 100% - 20%

= 80%.

h. Sets the percentage class interval, which is about the percentage divided by the criterion. Thus the percentage class interval is:

$$Interval\ Kelas = \frac{rentang\ skor}{rentang\ kriterian} \ldots\ldots\ldots (2.9)$$

$$= \frac{80\%}{5} \times 100\ \%$$

$$= 16\ \%.$$

To determine the results of the formula above, we enter it into the percentage interval table, the results of which were obtained from a field survey by distributing questionnaires, an example table can be seen in **Table 1** as follows.

Table 1. Determination of Comfort Level Criteria Based on Percentage Class Intervals (Muslihin, 2013)

No	Class Interval Percentage (%)	Criteria
1.	100 - 80	Very Comfortable (SN)
2.	80 – 60	Comfortable (N)
3.	60 – 40	Quite Comfortable (CN)
4.	40 – 20	Uncomfortable (TN)
5.	0 - 20	Very Uncomfortable (STN)

After the data is obtained and processed , then testing validation construction done with analysis factor , which with correlate between instrument item scores with formula *Person Product Moment* as following .

$$r_{count\ g} = \frac{n(\sum XY) - (\sum X).(\sum Y)}{\sqrt{(n.\sum X^2 - (\sum X)^2\}.\{n.\sum Y^2 - (\sum Y)^2\}}} \quad \ldots\ldots\ldots\ldots (3.6)$$

Where:

r_{count} = Correlation Coefficient

$\sum X$ i= Amount Item Score

$\sum Y$ i = Total Score (all items)

N = Number of Respondents

$r_{count} > r$ table. Means valid

$r_{count} < r$ table. Means invalid

The results from the r table are obtained if it is known that the significance for α= 0.05 dk is (N–2).

RESEARCH METHODOLOGY

Types of research

Study. This was carried out using observation, measurement, documentation and questionnaire methods where this research was carried out using data analysis techniques using tabulation weighting. Weighting is used in theoretical analysis while tabulation is used in empirical analysis (questionnaires). A descriptive research method was carried out to explain the conditions that occurred on the *pedestrian route* Jl. Palace and Jl. H. Agus Salim in the Bung Hatt Palace area, Bukittinggi.

Research Location and Time

a. Research sites

The research location is on the route. This location can be seen on the pedestrian route on Jl. Palace. Determination and Jl. H. Agus Salim in the Bung Hatta Palace area, the research location was based because the area is a place with a fairly high level of community activity. The location map can be seen **in Figure 1** as follows.

Figure 1. Research Location (Goggle Maps, 2024)

b. Research time

The time for research on pedestrian paths will start on January 10. The time for research is in the afternoon when there are many shifts in the use of *pedestrian paths* and is also carried out in the afternoon to find out the conditions at that time. This is very important to know the activities as well as the perception and development of the function of pedestrian paths and see their influence on pedestrian comfort. Observations are carried out on weekdays and holidays, timings are also chosen based on the occurrence of other non-pedestrian activities such as the presence of street vendors.

Data Collection Plan

There are several methods used to collect data that will be carried out, the methods that the researcher intends or that the researcher has written can be seen below as follows.

a. Methods Used

The sampling technique in this research used a random sampling *technique* . A sample is part of the number and characteristics of a population. Sample measurements are carried out through statistics or based on research estimates to determine the size of the sample taken in carrying out research on an object. Because the population of this research object uses the Slovin formula. (If the population size is known) As follows.

$$n = N \frac{N}{1+\sqrt{Ne^2}} \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots \quad (3.1)$$

Information:

n = Sample Size (org).

N = Population Size (org).

e^2 = *error* tolerance limit .

Data Types and Sources

Data sources are anything that can provide information about research regarding related research. The data used in this research uses two types of data sources, namely as follows.

a. Primary data

b. Secondary Data

Data Collection Method

Based on objective research , then technique data collection is carried out with method observation , distribution questionnaires , and documentation . The data collection technique can clarified as following .

a. Observation , that is something method For obtain data via activity observation straight away to object study For obtain relevant information with object study

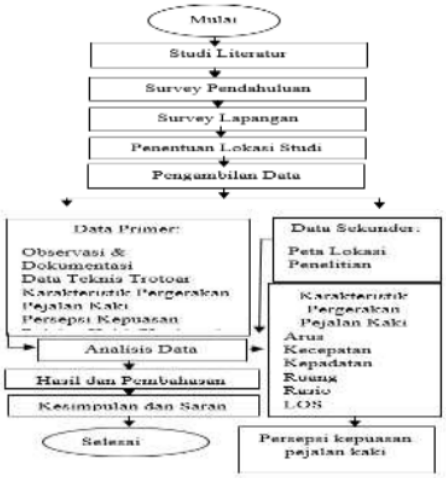
b. Questionnaires , that is The sampling technique is *simple random sampling,* in accordance with data collection The number of pedestrians active at the research location can be seen in more detail on Results and discussion chapter later.

c. Documentation, which is an actual picture of what is happening or existing in the field, such as pedestrian paths, sidewalk facilities, research locations, and also respondents who are active at the research location, which is actually our evidence in the field later

Research Flow Chart (Flow Chart)

This is based on the research stages, starting from literature studies to obtaining results from comfort analysis according to the analysis method used, which can be seen in **Figure 2** as follows.

Figure 2. Flow Chart



Implementation of Research

a. Preliminary Survey

A preliminary survey is useful for determining the location and time of research, carried out by reviewing the location in choosing a place that supports research.

b. Implementation of Sampling

The following are samples taken simultaneously.

- The dimensions of the sidewalk are: height of the sidewalk carriage, width of the sidewalk, free space on the sidewalk, and facilities on the sidewalk.
- Observations include pedestrian path activities in the form of *pedestrian areas* , the texture of the sidewalk covering material (whether there is anything obstructing it or not).
- The distribution of questionnaires was only distributed at the research focus location, namely the *Pedestrian Path* on Jalan Istana in the Bung Hatta Palace area

c. Measurement of Sidewalk Dimensions and Volume

When measuring sidewalk dimensions, use a simple method, namely using a meter. The items measured with this tool are:

- Curb height on the sidewalk.
- Sidewalk width.
- Free sidewalk space.

To determine the volume of pedestrians (meters/minute), this is done by recording the number of pedestrians who pass by the observation point with a distance of ± 50 meters passing the observation point, starting at the hour, namely.

- 12.00 - 13.00 WIB.
- 13.00 - 14.00 WIB.
- 14.00 - 15.00 WIB.
- 15.00 - 18.00 WIB.

Summarized every 1 hour, takes approximately 3 (three) days. By using stationery, calculators and stopwatches to measure pedestrian speed data passing the observation point.

d. Direct Observation and Documentation

In this research, active participant observation techniques were used, meaning that the researcher was directly involved in the daily activities of the person being observed and participated in what the resource person was doing and took photos as documentation and evidence later.

e. Distribution of Questionnaires

Distribution of questionnaires using *simple random sampling technique*. In accordance with *pedestrian path users* at the research location by distributing questionnaires to respondents at the research location, which can be seen more clearly in the results and discussion chapters.

Pedestrian Characteristics

Data obtained from the research location was analyzed using the *Higway Capacital Manual* (HCM) method including pedestrian analysis, which for many years has been the source for most pedestrian variables (LOS) for use in pedestrian assessment in the UK (Al-Azzawi 2004) . I entered it into the Microsoft Excel program application. Data analysis begins when the research data is collected completely and then processed and analyzed as follows.

a.Pedestrian Flow Analysis

Pedestrian flow is calculated based on the number of pedestrians who pass the observation point at 60 minute intervals.

b. Pedestrian Speed Analysis

The data used is the travel time of pedestrians passing through the observation points. The length of the section is determined to be 50 meters, using travel time in minutes, that is, the units will be obtained in meters per minute.

c. Pedestrian Density Analysis

Density *is* obtained from the variables that were searched for in the previous section, namely *flow* and *speed* .

d. Pedestrian Space Analysis

In analyzing space for pedestrians, data on the average speed of the space divided by the flow is used.

e. Pedestrian Ratio Analysis

In analyzing the ratio, it is between flow and pedestrian capacity.

Level of Service (LOS)

Level of service *Level of service* (Los) is a walking speed and pedestrian flow. The relationship between service level and speed (meters/minute) as well as walking user paths (m^2/person) can be seen in Table 2 as follows.

Table 2. Comfort Level (Muslihin, 2013)

Level of Service (LOS)	Space (m^2/org)	Speed n (m/min)	Current (ped/m/min)	Ratio (V/C)
A	> 12	> 79	≤ 6.5	≤ 0.08
B	> 4	> 76	≤ 23	≤ 0.28
C	> 2	> 73	≤ 33	≤ 0.40
D	> 1.5	> 69	≤ 46	≤ 0.60
E	> 0.5	> 46	≤ 82	≤ 1.0
F	< 0.5	< 46	Varies	Varies

Questionnaire

A questionnaire is a method for obtaining data by containing a list of entries given to pedestrian path users/research subjects. A questionnaire is a tool or method Which used in obtain information from pedestrian foot about characteristics movement from pedestrian foot. The data needed to determine the movement characteristics of pedestrians as following .

a. Name

b. Gender

c. Pedestrian age

d. Pedestrian work

e. last education

RESULTS AND DISCUSSION

Data collection

Data collection was carried out on Wednesday 10 January 2024, Saturday 13 January, and Sunday 14 January 2024 at 12:00 – 18:00 WIB, which obtained pedestrian data which was raw data, so it had to be processed first using each calculation method. . The data that must be processed is flow, speed, density, space, ratio and level of service for sidewalk users. For data on the number of pedestrians, we can see **Table 3** as follows.

Table 3. Data on the number of pedestrians per segment

Waktu	Jl. Istana			Jl. H. Agus Salim		
	Rabu	Sabtu	Minggu	Rabu	Sabtu	Minggu
12:00 - 13:00	22	214	195	15	104	133
13:00 - 14:00	34	208	209	12	112	178
14:00 - 15:00	26	204	246	25	95	159
15:00 - 16:00	42	182	217	33	101	145
16:00 - 17:00	38	220	250	22	93	124
17:00 - 18:00	59	236	227	47	106	163
Jumlah	221	1264	1344	154	611	902

Table 4. Time table travel pedestrian

Waktu	Data Kecepatan Pejalan Kaki(detik)					
	Jl. Istana			Jl. H. Agus Salim		
	Rabu	Sabtu	Minggu	Rabu	Sabtu	Minggu
12:00 - 13:00	56	59	55	58	56	54
13:00 - 14:00	59	53	50	47	57	55
14:00 - 15:00	49	54	57	53	59	54
15:00 - 16:00	58	49	54	57	58	59
16:00 - 17:00	59	45	59	55	59	58
17:00 - 18:00	58	56	55	59	59	54
Rata-rata	56,50	52,67	55,00	54,83	58,00	55,67

Data Analysis of Pedestrian Characteristics

a. Pedestrian *Flow*

Pedestrian flow data is calculated by the number of pedestrians who pass the observation point, which is carried out on Wednesday, Saturday and Sunday with a time interval of 60 minutes with an observation point distance of ± 50 meters. Example of calculating pedestrian flow on Wednesday 10 January 2023 at 12:00 – 13:00 WIB on Jalan Istana Bukittinggi with 60 minute intervals.

Table 5. Calculation of Pedestrian Flow Jl. Palace.

Waktu	Segmen I							
	Jumlah Pejalan Kaki			60 (menit)	Lebar efektif	Arus Pejalan Kaki		
	Rabu	Sabtu	Minggu			Rabu	Sabtu	Minggu
12:00 - 13:00	22	214	195	60	5	0,07	0,71	0,65
13:00 - 14:00	34	208	209	60	5	0,11	0,69	0,70
14:00 - 15:00	26	204	246	60	5	0,09	0,68	0,82
15:00 - 16:00	42	182	217	60	5	0,14	0,61	0,72
16:00 - 17:00	38	220	250	60	5	0,13	0,73	0,83
17:00 - 18:00	59	236	227	60	5	0,20	0,79	0,76
rata-rata						0,12	0,70	0,75

b. Pedestrian Speed

Travel time is calculated in seconds, and speed is calculated in meters per minute. For example, the calculation on Wednesday 10 January 2024 at 12:00-13:00 WIB (60 minute interval) for pedestrian segment 1 is 53 seconds, so the speed for pedestrians = ± 50 meters in **Table 6** as follows.

Table 6. Speed Calculation on Jl. Palace

Segmen I							
Waktu	Rata Rata Waktu Tempuh			Jarak (L) m	Kecepatan (m/min)		
	Rabu	Sabtu	Minggu		Rabu	Sabtu	Minggu
12:00 - 13:00	56	59	55	50	53,57	50,85	54,55
13:00 - 14:00	59	53	50	50	50,85	56,60	60,00
14:00 - 15:00	49	54	57	50	61,22	55,56	52,63
15:00 - 16:00	58	49	54	50	51,72	61,22	55,56
16:00 - 17:00	59	45	59	50	50,85	58,00	50,85
17:00 - 18:00	58	56	55	50	51,72	53,57	54,55
jumlah rata-rata kecepatan					53,32	55,97	54,69

c. Pedestrian Density

Table 7. Density on Jl. Palace

Segmen I									
Waktu	Arus (Q)			Vs			D (Ped/m²)		
	Rabu	Sabtu	Minggu	Rabu	Sabtu	Minggu	Rabu	Sabtu	Minggu
12:00 - 13:00	0,07	0,71	0,65	0,41	4,21	3,58	0,18	0,17	0,18
13:00 - 14:00	0,11	0,69	0,70	0,67	3,67	3,48	0,17	0,19	0,20
14:00 - 15:00	0,09	0,68	0,82	0,42	3,67	4,67	0,20	0,19	0,18
15:00 - 16:00	0,14	0,61	0,72	0,81	2,97	3,91	0,17	0,20	0,19
16:00 - 17:00	0,13	0,73	0,83	0,75	3,79	4,92	0,17	0,19	0,17
17:00 - 18:00	0,20	0,79	0,76	1,14	4,41	4,16	0,17	0,18	0,18
jumlah rata-rata kepadatan							0,18	0,19	0,18

d. Pedestrian Space

Table 8. Pedestrian Space on Jl. Palace

Segmen I						
Waktu	D (ped/m²)			S (m²)		
	Rabu	Sabtu	Minggu	Rabu	Sabtu	Minggu
12:00 - 13:00	0,18	0,17	0,18	5,60	5,90	5,50
13:00 - 14:00	0,17	0,19	0,20	5,90	5,30	5,00
14:00 - 15:00	0,20	0,19	0,18	4,90	5,40	5,70
15:00 - 16:00	0,17	0,20	0,19	5,80	4,90	5,40
16:00 - 17:00	0,17	0,19	0,17	5,90	5,17	5,90
17:00 - 18:00	0,17	0,18	0,18	5,80	5,60	5,50
Jumlah rata-rata ruang				5,65	5,38	5,50

e. Pedestrian Ratio

Table 9. Calculation of Pedestrian Ratio on Jl. Palace

Segmen I						
Waktu	Arus (Q)(ped/m/min)			V/C		
	Rabu	Sabtu	Minggu	Rabu	Sabtu	Minggu
12:00 - 13:00	0,07	0,71	0,65	0,0010	0,0095	0,0087
13:00 - 14:00	0,11	0,69	0,70	0,0015	0,0092	0,0093
14:00 - 15:00	0,09	0,68	0,82	0,0012	0,0091	0,0109
15:00 - 16:00	0,14	0,61	0,72	0,0019	0,0081	0,0096
16:00 - 17:00	0,13	0,73	0,83	0,0017	0,0098	0,0111
17:00 - 18:00	0,20	0,79	0,76	0,0026	0,0105	0,0101
Jumlah rata-rata rasio				0,0016	0,0094	0,0100

f. Level of Service *Level of Service* (LOS)

The aim of conducting this research is also to determine the level of service for pedestrian facilities on pedestrian paths in the city of Bukittinggi, especially starting from Jl. Palace to Jl. H. Agus Salim. Determination of service levels is obtained from the results of primary data processing, especially pedestrian volume in **Table 10** as follows.

Table 10 . *Level of Service* Analysis Results

Segmen I (Rabu 10 Januari 2024)						
Waktu	Arus (Q) (ped/mnt/m)	Kecepatan (m/min)	D (ped/	S (ped/	V/C	LOS
12:00 - 13:00	0,07	53,57	0,18	5,60	0,0010	A
13:00 - 14:00	0,11	50,85	0,17	5,90	0,0015	A
14:00 - 15:00	0,09	61,22	0,20	4,90	0,0012	A
15:00 - 16:00	0,14	51,72	0,17	5,80	0,0019	A
16:00 - 17:00	0,13	50,85	0,17	5,90	0,0017	A
17:00 - 18:00	0,20	51,72	0,17	5,80	0,0026	A

g. Pedestrian Comfort

Respondents' perceptions regarding the comfort of pedestrian paths were analyzed using inferential analysis, the aim of which was to see data trends and draw conclusions. Data recapitulation can be seen in Table 11 as follows.

Table 11 . Recapitulation of Respondents' Perceptions Regarding Pedestrian Path Conditions

Responden	No. Soal Aspek Kenyamanan										jumlah skor
	1	2	3	4	5	6	7	8	9	10	
R-01	4	1	2	3	3	5	5	4	5	4	36
R-02	4	3	3	3	3	3	3	4	4	3	33
R-03	3	2	1	3	3	4	3	4	3	3	29
Dst											Dst
R-98	4	3	3	5	4	4	4	4	4	4	39
R-99	4	3	2	4	3	5	4	4	3	3	35
R-100	5	4	5	5	5	5	5	5	5	5	49
Jumlah Skor Hasil Pengumpulan Data											3594

Based on **Table 11,** it can be seen from the results of the recapitulation that the total number of perceptions from 100 respondents is 3594. With that, the condition of pedestrian paths according to the perceptions of 100 respondents, namely.

$$\frac{3594}{5000}\ x\ 100\ \% = 72\ \%$$

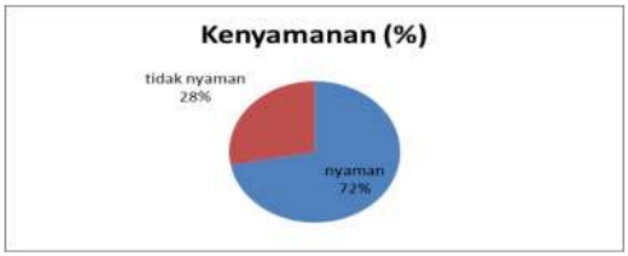
From the results of the calculations above, the comfort percentage value obtained from 100 respondents is 72%. If you look at the Muslihin table (2013), the percentage figures obtained fall into the comfortable category. According to the questionnaire and calculations above, pedestrians who use *pedestrian paths* on roads across the city of Bukittinggi, the most preferred thing for pedestrians is the inconvenience of traveling, which can be seen in **Table 12.**

Table 12. Pedestrian Comfort

No	Characteristics	Number of respondents	Percentage
1	Comfortable	72 respondents	72 %
2	Uncomfortable	28 respondents	28 %
	Amount	100	100%

Based on **Table 12,** we can see the results of comfort and non-convenience and if we make it into a pie chart, it can be seen in **Figure 3** as follows.

Figure 3 . Pedestrian Comfort



Person Product Moment data test method with the help of *Microsoft Excel*. There were 10 items tested. You can see the calculation for item 1 as follows.

To determine instrument validation, calculations are carried out using the test method *Person Product Moment* data manually with the help of *Microsoft Excel*. There were 10 items tested. In **Table 13** you can see the calculations for item 1.

Table 13. Question Item Number 1

Item Pertanyaan Nomor 1					
No	X	Y	XY	$(X)^2$	$(Y)^2$
R-01	4	36	144	16	1296
R-02	4	33	132	16	1089
R-03	3	29	87	9	841
↓					↓
R-98	4	39	156	16	1521
R-99	4	35	140	16	1225
R-100	5	49	245	25	2401
	$\sum X$	$\sum Y$	$\sum XY$	$\sum X^2$	$\sum Y^2$
Jumlah	376	3594	13806	1476	132702

After the data for item number 1 has been tabulated and calculated, the correlation price for each item is then calculated using the following formula.

- $rhitung = \frac{n(\sum XY)-(\sum X).(\sum Y)}{\sqrt{(n.\sum X^2-(\sum X)^2\}.\{n.\sum Y^2-(\sum Y)^2\}}}$
- $rhitung = \frac{100(13806)-(\sum 376).(\sum 3594)}{\sqrt{\{100.1476-(376)^2\}.\{100.\sum 132702-(3594)^2\}}} = 0{,}624$

According to the results of instrument validation testing with *the person product moment test* using the Excel 2010 program, the results of the comfort level questionnaire on *pedestrian paths* are shown in **Table 14** . as follows.

Table 14 . Data Validation Test Results Using *Person Product Moment*

No	Kondisi Jalur Pedestrian	Pearson Correlation (r.hitung)	Harga (r.tabel)	Hasil
1	Pemandangan sekitar trotoar	0,624	0,165	V
2	kebisingan kendaraan	0,658	0,165	V
3	Aroma bau tidak sedap	0,689	0,165	V
4	bentuk kualitas trotoar	0,549	0,165	V
5	kelengkapan fasilitas	0,672	0,165	V
6	kenyamanan jalur *pedestrian*	0,643	0,165	V
7	kebersihan jalur *pedestrian*	0,751	0,165	V
8	keindahan jalur *pedestrian*	0,728	0,165	V
9	kejelasan sirkulasi dengan pejalan kaki	0,695	0,165	V
10	Aksebilitas jalan ketujuan	0,735	0,165	V

From the results of the research instrument test, it can be concluded that of the 10 question items regarding the condition of pedestrian paths on Bukittinggi City Palace Road, the

measuring instrument states that all items are valid with the basis for decision making in this validation test as follows:

$r_{count} > r$ table. Means valid

$r_{count} < r$ table. Means invalid

The results from the r table are obtained if it is known that the significance for α= 0.05 dk is (N – 2) = 100 -2 = 98, then the r table obtained is 0.1654.

CONCLUSIONS AND RECOMMENDATIONS

Conclusion

According to data from the results of processing the characteristics of pedestrian movements, especially on Jl. Palace and Jl. H. Agus Salim was obtained.

1. For the results of pedestrian movement characteristics, flow data *in* segment I was 0.12, 0.70 and 0.75 pedestrians/m/min, in segment II it was 0.29, 1.13 and 1.67. pedestrians/m/min. For *speed* data in segment I, it was found to be 52.32, 55.97 and 54.97 m/min, in segment II it was 55.03, 51.74 and 53.96 m/min. *The density* in segment I is 0.18, 0.19 and 0.18 m^2/ped, in segment II it is 0.62, 0.57 and 0.60 m^2/ped. Space in segment I is 5.65, 5.38 and 5.50 m^2/ped, segment II is 1.62, 1.74 and 1.67 m^2/ped. The pedestrian ratio in segment I is 0.0016, 0.0094 and 0.0100, segment II is 0.00380, 0.01509 and 0.02227. In the form of the level of pedestrian service on Jl. Palace and Jl. H. Agus Salim in the Bung Hatta Palace area of Bukittinggi is A, because pedestrians can move freely as they wish without any disturbance from other pedestrians.
2. From the questionnaire, the comfort value was 72%. Based on the class interval, the percentage of comfort level can be categorized as comfortable.

Suggestion

Suggestions from researchers based on studies that have been carried out, researchers suggest to the Bukittinggi city government to accommodate opinions from users of pedestrian paths/sidewalks to add facilities to pedestrian paths so that sidewalk users feel comfortable on those paths. For the public, awareness is needed not to abuse the function of sidewalks, where sidewalks are built for pedestrian use, not for sales and especially for parking, and for pedestrians to maintain existing facilities and maintain facilities that have been provided by the local government and do not forget to throw rubbish in the place provided, such as a rubbish bin, so that other pedestrians don't feel the fishy smells around the sidewalk and feel comfortable every time they walk around the sidewalk.

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