



# The Effect of Green Planning Design on Pedestrian Way at Jln. Kyai Tapa, Grogol Petamburan, West Jakarta

Reza Fauzi<sup>(✉)</sup> and Nur Intan Simangunsong

Trisakti University, Jakarta, Indonesia  
reza.fauzi@trisakti.ac.id

**Abstract.** Urban areas have a variety of activities both indoors and outdoors. Green open space is one of the means to support urban community activities. Green open space is one of the essential factors for the urban environment, and pedestrian paths are one of the areas that can become green open spaces for urban areas. In addition to being a means of accessibility for the community, pedestrian paths can also be an identity for urban areas. The purpose of this study is to identify how an appropriate and suitable landscape design will affect users and the surrounding environment and look for factors that can influence the utilization of pedestrian paths to solve problems that arise so that the use of pedestrian paths can run optimally. The problem encountered at the research location is the lack of precise green arrangement on the pedestrian path, causing the influence of the existing green layout design to be not optimal for pedestrian activities. The proper arrangement of plants, in addition to adding comfort to the user, will also increase the aesthetic value of an area. This study uses the quantitative method to test specific theories by examining the relationship between variables obtained from survey results and data collection. Green Planning Design, using plant species, and pedestrian activities are the aspects studied in this study. The success of green open space is strongly influenced by the landscape design applied to the area, from the spatial arrangement to the arrangement of the supporting elements used on the pedestrian path.

**Keywords:** Landscape Design · Comfort · Pedestrians

## 1 Introduction

Green open space can be met through the availability of urban forests, green open space, and reforestation in residential or office yards. Furthermore, green open space helps socialize and exercise, improving the quality of the residential environment (Winandari, 2015). Pedestrian paths can be a place that accommodates community activities and can also function as linear green open spaces that become spaces for interaction and become the identity of urban areas. Good pedestrian paths should be able to be passed or accessed by all levels of society, including people with special needs.

The pedestrian area on Jln. Kyai Tapa Grogol is an active pedestrian path because it is located in an urban area (Commercial and Offices), so sometimes the pedestrian path in this area is quite crowded. Therefore, arranging a suitable landscape to support activities on the pedestrian path is necessary. The main activity on the pedestrian path is walking; therefore, the main activity must be raised and equipped with other aspects of activities so that it will create an integration of existing activities.

The general problem is that the existing facilities or supporting elements have not functioned optimally, so pedestrian activities as the primary users have not been accommodated optimally. The phenomenon that often occurs is the misuse of the function of space or facilities by informal and other activities. Therefore, the proper arrangement of the pedestrian path by maximizing the primary function of the pedestrian path as a walking area will significantly affect the main activities on the pedestrian path.

The pedestrian path is a means of accessibility or connecting one area to another. It is necessary to consider the proper arrangement so that the main activities in the area take place well and are comfortable for its users.

## **2 Problem Formulation**

- a. What is the current landscape design on Jln. Kyai Tapa, Grogol, West Jakarta, has it met the criteria for landscape design?
- b. Is the arrangement of existing facilities and supporting elements functioning optimally for pedestrian activities?
- c. What is a good landscape design for pedestrian paths in an urban environment?

## **3 Purpose**

- a. Evaluating the existing landscape design on the Jln. Kyai Tapa, Grogol, West Jakarta
- b. Identify patterns and selection of materials, facilities, or supporting elements in the pedestrian path Jln. Kyai Tapa, Grogol, West Jakarta
- c. Identifying the existing green pattern on the Jalan Pedestrian Jln. Kyai Tapa, Grogol, West Jakarta

## **4 Literature Review**

### **4.1 General Concept of Pedestrian Paths**

Sidewalks or pedestrian paths are located side by side with vehicle traffic lanes, which are used explicitly by pedestrians. For pedestrian safety, this sidewalk must be separated from the vehicle traffic lane by a physical structure in the form of a roadblock. Whether or not sidewalks are provided depends on the volume of pedestrians and the traffic volume of the road users, the width of the sidewalks used generally ranges from 1.5 to 3.0 m (Sukoco, 2002). The Flow of vehicles where the relationship between volume, speed, and density is the same. The volume and density of the pedestrian flow increases, from what was originally a free flow to a more crowded condition, so that the speed and movement ahead of other pedestrians decreases. The level of service can be used to determine the

level of comfort on the highway, and it can also be used for pedestrian facilities. With the concept of service level, the comfort factor is the ability to choose a walking speed where pedestrians will walk faster, avoiding conflicts with others related to pedestrian density and volume.

## **4.2 Criteria Pedestrian**

The pedestrian path physically is an architectural form that has a specific shape and provides benefits as space. From the theory of form, space, and architectural arrangement proposed by Ching (1979), form (building architecture) is composed of visual characteristics of its shape, which can be described as follows:

- a. Form is the result of a specific configuration of the surfaces and sides of a form, which is the main characteristic of a constructive form.
- b. Dimensions, regarding width, length, and height, where these dimensions also determine proportions.
- c. Color is a pattern of intensity and tone on the surface of a form. Color is the most striking attribute that distinguishes a form from its environment. Color also affects the visual weight of a form.

## **4.3 The Pedestrian Zone**

The pedestrian zone consists of several parts, namely the front zone of the building, the use zone for pedestrians, the plant/furniture zone, and the roadside zone (The Guidelines for Provision and Utilization of Infrastructure and Facilities for Pedestrians in Urban Dept. PU, 2012 - Pedoman Penyediaan dan Pemanfaatan Prasarana dan Sarana Ruang Pejalan Kaki di Perkotaan Dept.PU, 2012).

## **4.4 Pedestrians**

According to Amos Rapoport (1977), based on the speed, the walking mode has the advantage of being low speed, so it is advantageous because it can observe the surrounding environment and objects in detail and is quickly aware of the surrounding environment.

## **4.5 Circulation and Parking**

The urban circulation includes the available road infrastructure, the shape of the urban structure, public service facilities, and the level of vehicle density in the urban area. Circulation flow can be interpreted as a “rope” that binds the spaces of a building or a series of indoor and outdoor spaces to be interconnected, as expressed by Francis DK Ching, 1993.

## **4.6 Elements Landscape**

Elements Landscape are everything in the form of objects, sounds, colors, and atmospheres that make up the landscape, both natural and artificial. (Procedures for Road Landscape Engineering Planning, No: 033/T/Bm/1996 March 1996, Ministry of Public Works, Directorate General of Highways.

#### 4.7 The Planting Path

The planting path is a path for placing plants and other landscape elements within the Road Owned Area (Daerah Milik Jalan - DAMIJA) or in the Road Monitoring Area (Daerah Pengawasan Jalan DAWASJA). Often called the green line because of the dominance of landscape elements and plants that are generally green. (Procedures for Road Landscape Engineering Planning, No: 033/T/Bm/1996 March 1996, Ministry of Public Works, Directorate General of Highways - Tata Cara Perencanaan Teknik Lansekap Jalan, No: 033/T/Bm/1996 Maret 1996, Departemen Pekerjaan Umum Direktorat Jenderal Bina Marga).

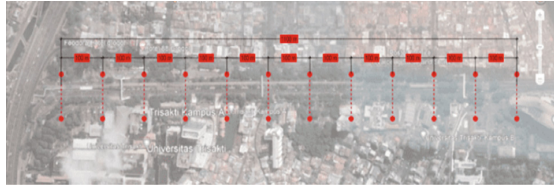
#### 4.8 Elements of Pedestrian Paths

According to Rubenstein (1992), elements of pedestrian paths include:

1. Paving is a flat pavement or expanse (Echols, JM, 1983). In this case, paying attention to the scale of the pattern, color, texture, and absorption of running water are essential.
2. Lamps are used as lighting at night. Several types of lights are elements of supporting urban design (Chearra, 1978).
3. Signs, elements intended for providing an identity, information, or prohibition.
4. Sculptures, elements intended to provide an identity, information, or prohibition, or attract attention (vocal points), are usually located in the middle or front of the plaza.
5. Bollards are elements for being barriers between pedestrian paths and vehicle lanes. They are usually used in conjunction with laying lamps.
6. Bench, to provide a rest area when tired of walking and give pedestrians time to enjoy the atmosphere of the surrounding environment.
7. The shade plants, for covering and conditioning pedestrian paths. According to Rustam Hakim (1987), the criteria for plants needed for pedestrian paths are resistance to the effects of air and weather and also the dense leaf mass.
8. The kiosks' existence can liven up the atmosphere on the pedestrian path so that it is not monotonous. Especially kiosks for buying and selling activities, if at any time pedestrians are needed.
9. Trash cans should be placed on pedestrian paths to keep them clean.
10. Halte, Harris and Dinnes (1988) stated that the requirement for a bus stop is to have freedom of sight towards arrival, both standing and sitting at the stop, and the bus stop zone must be part of the pedestrian access network. According to 1993 Minister of Transportation Decree no. 65 of 1993 bus stop facilities should be built close to pedestrian crossing facilities.

#### 4.9 Transition Area

The transition area is expected to be a facility for pedestrians where after they rest, they can continue their journey back on foot (Irawati & Utami, 2013).



**Fig. 1.** Research Locations

## 5 Research Methods

### 5.1 Time and Place of Research

The research was conducted on Jln. Kyai Tapa, Grogol, West Jakarta. The area is quite busy with activities because it is in the middle of the city with several buildings, such as campuses, shopping centers, hotels, and terminals. Furthermore, the area is not far from the residential area, so the pedestrian path on Jln. Kyai Tapa, Grogol, West Jakarta, is a pedestrian path that is quite busy with activities (Fig. 1).

### 5.2 Methods of Analysis

In this research, the method used is a quantitative method. Quantitative research is a method used to test certain theories by examining the relationship between variables. These variables will be measured so that the data collected and consists of numbers can be analysed based on statistical procedures. (Cresswell, 2012).

- Data processing is done by processing the results of survey activities, interviews along with various kinds of information and data obtained during field surveys
- Examination of survey and interview data is carried out by comparing, identifying with data and information obtained from literature studies.

The variables determined in this study include: 1) Functional variables where each facility is on the pedestrian path that affects pedestrian comfort. 2) User comfort is closely related to the arrangement of the green layout and facilities located on the pedestrian path, whether the existing facilities and arrangements have given and have a positive effect on users.

### 5.3 Data Collection Method

The primary data collection method was conducted by field observation, and secondary data collection was carried out via the internet or other literature. Data analysis using descriptive statistical analysis method is used to analyze the data that has been collected by describing or describing the data.

## 6 Discussion

### 6.1 Overview

This research was conducted on a pedestrian path on Jln. Kyai Tapa, Grogol, West Jakarta. Specifically on the pedestrian path on the side of the Trisakti Campus Jln. Kyai Tapa, Grogol from the Reform Monument (12 May) to the Police Office near Roxy Mall. The discussion in this research is carried out on the pedestrian path, which will be divided into two parts; the pedestrian path arrangement and the pedestrian path is green arrangement. The activities on the pedestrian path Jln Kyai Tapa, Grogol are relatively active. This existence is in an urban area between office buildings, hotels, campuses, and terminals, especially during and after work.

### 6.2 Pedestrian Path Arrangement

According to the Guidelines for Building Construction Materials and Civil Engineering, (Pedestrian Facility Technical Planning, Ministry of PUPR 2018). The general principles of pedestrian facility planning must at least meet the following rules:

- a) Fulfilling aspects of system integration, from environmental management, transportation systems, and inter-regional accessibility;
- b) Fulfilling aspects of continuity, namely connecting the place of origin to the destination and vice versa;
- c) Meet the safety, security, and comfort aspects;
- d) Fulfilling the accessibility aspect, the planned facilities must be accessible to all users, including users with various physical limitations.

In points C and D, it can be concluded that comfort and usability must be accessible to all users. Therefore the arrangement of the pedestrian path will affect user convenience. Without a proper arrangement, the function of the pedestrian path will not be optimal due to disturbances or problems that arise if the arrangement of the pedestrian path is not appropriate and follows the conditions or circumstances of the existing location (Fig. 2).

The picture above shows the existing condition of the pedestrian path on the campus side of Jln. Kyai Tapa, Grogol Petamburan, West Jakarta. The green layout in the pedestrian area looks not optimal; visually, it can be seen that there are a lot of empty



**Fig. 2.** Existing Condition of Pedestrian Paths.

spaces that can be filled by greening. Besides, the current plant arrangement is also not good because the functions of these plants are not optimal.

### 6.3 The Green Arrangement for Pedestrian Paths

Murdaningsih (2010) states that plants or vegetation on the road must meet efficiency, comfort, and safety aspects as well as an attractive appearance for the smooth circulation of road users. Vegetation has several functions for open spaces that can be used as a reference in determining and organizing the vegetation or green needs of open spaces.

Choosing the type of plant will be maximized if it is adjusted to the function that will appear according to the conditions and character of the site. Plants or vegetation on pedestrian paths generally serve as barriers, directions, safety, and shade.

According to Rustam Hakim (2004), plants' function not only contains aesthetic value but also serves to improve the quality of the surrounding environment. The various functions of plants can be classified as follows: 1) Visual Control, 2) Physical Barriers, 3) Climate Control, 4) Erosion Prevention, 5) Animal Habitat, and) Aesthetic Value.

Some of these things can be the basis for structuring a green space on a pedestrian path. An appropriate landscape arrangement will create a pedestrian area with maximum function for users and the surrounding environment. In addition, to maximize the existence of pedestrian paths in urban environments, it is also necessary to consider the criteria for vegetation or plants used. Based on the Regulation of the Minister of Public Works Number: 05/PRT/M2008 concerning Guidelines for Provision and Utilization of Green Open Space in Urban Areas, namely:

1. Non-Toxic, No Thorns, Roots do not disturb the foundation
2. Header is quite shady but not too dark
3. The height of the plant varies; the green color with other color variations is balanced
4. Beautiful stature and header shape
5. Medium growth speed
6. In the form of local and seasonal plant habitats
7. Spacing closely to produce optimal shade
8. Resistant to plant pests and diseases
9. Able to absorb polluted air
10. Wherever possible is a plant that invites birds or small animals such as butterflies

### 6.4 Character Analysis of Green Planning on Pedestrian Paths

The arrangement of plants or green on the pedestrian path, Jln Kyai Tapa, Grogol, West Jakarta, is in the form of trees, shrubs, and ground cover. However, the arrangement in these areas cannot make the condition of this pedestrian path more visually and functionally comfortable (Fig. 3).

The park on the pedestrian path is also known as the green line, which is a place/land/part of the road as a place for planting plants. Parts of the road that are used green lanes include the median road, along the pedestrian path, and the shoulder of the road.

### Green Open Space Arrangement Road Network

Arrangement of green open space on the road network such as pedestrian paths in the



**Fig. 3.** Existing Condition of Pedestrian Paths.

form of greening along the road, both on the edge of the road and the median. The function of the green element on the pedestrian path is as a safety, and protector, giving direction and providing visual quality to drivers and pedestrians, as well as minimizing air pollution and noise from motorized vehicles.

In the development of green space, several things need to be considered, including:

- a. Spacing between trees or shrubs
- b. The arrangement of plants and complementary elements must be kept in mind between the shape and size of the canopy and complementary elements
- c. In order not to give a monotonous impression, the arrangement of plants/trees can be planted crosswise
- d. In addition to security criteria, it is also necessary to pay attention to the quality or visual appearance to improve the area's aesthetic quality.

Bararatin and Hayati 2016 (cited from McClusky, 1992) state that plants in an environment provide deep psychological satisfaction for users in that area. Plants have been used concerning pedestrian paths, namely (Fig. 4):

1. Ecological functions, such as absorbing toxic gases and expelling oxygen
2. Engineering functions such as light shielding, noise control, climate control, wind protection, and being a traffic-directing element are also space dividers
3. Architectural functions, such as improving the visual quality of the street space through plant forms, colors, and textures.

Figure 5 shows the variations in the shape of the plants on the pedestrian path of Jln. Kyai Tapa, Grogol has not fulfilled the aesthetic function. The number and arrangement of plants are still lacking, so the presence of plants does not provide a significant function in the pedestrian path area.

The current placement or arrangement of plants does not seem to meet the aesthetic aspect, so the pedestrian path is not visually attractive. The arrangement of plants on the





**Fig. 4.** Existing Condition of Pedestrian Paths

pedestrian path requires various types and dynamic patterns so that the green layout on the pedestrian path can provide a visual improvement in the area.

### **The Design Recommendations**

The arrangement of the green line must be adjusted to the objectives to be achieved and adapted to the environment's location to form the area's character. The arrangement and selection of plant species must pay attention to various aspects such as the form of space, growing conditions, plant functions, and maintenance procedures. Elements of green planning on public pedestrian paths are related to aesthetics; in addition to choosing the type, paying attention to plant composition is also very important to form an area with maximum function and visual quality.

The green layout on pedestrian paths will affect pedestrian path users, in addition to sufficient space for comfort, such as shade, and comfort for the user's eye, it also needs to be a concern in structuring pedestrian paths. Pedestrian activities can be grouped into six: walking, standing, sitting, lying down, running, and playing. The most common activities are Walking, standing, and sitting. Based on interests, activities can still be divided into three types, namely necessary activity (the main activity), optional activity (the additional activities including leisurely walks and enjoying the scenery), and following activity (the social activities, including sitting relaxed and interacting). Based on this, it can be said that a good activity is if the additional activity is greater than the main activity. (Rahadi, Fitra Anindya 2003).

Figure 6 shows how a good plant composition in landscape arrangement and using low to high-height plants will provide a pleasing pedestrian experience. A good plant composition will also maximize the function of plants applied to the pedestrian path area, such as a space divider, protection from pedestrian paths, and creating a microclimate in the pedestrian path area.

A good arrangement of vegetation on the pedestrian path will improve several aspects, such as a space barrier between the road and the pedestrian path, as a guide, as a microclimate creator, and it can also improve the visual quality of the area.

The Plant strata in the green system must be applied to pedestrian paths. Besides functioning as the beauty of the application of plant strata ranging from groundcover,

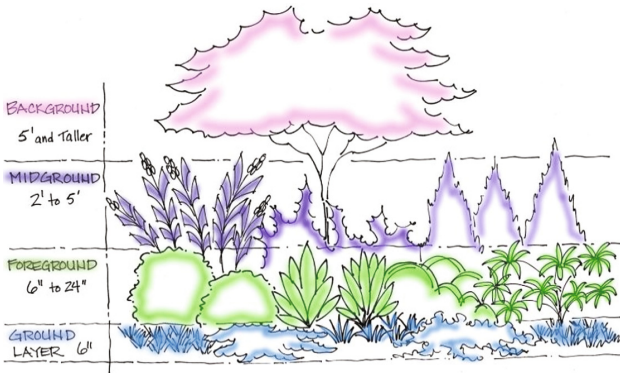


Fig. 5. Plant Composition



Fig. 6. Recommendations for Green. Planning for Pedestrian Paths

shrubs, and trees, they can also be used as noise absorbers and reduce the light of car lights at night for pedestrians passing by a pedestrian path.

The spacing of trees on the pedestrian path is crucial to pay attention to get maximum shade on a pedestrian path; an encounter between tree canopies will provide maximum shade or minimum spacing for each tree  $\pm 3$  m. The wrong green arrangement will affect the comfort of pedestrians, and this should not happen because the pedestrian path should be a means for people to go to a place without using a vehicle. If the pedestrian path is comfortable for users, people's habit of walking will likely increase and reduce the use of motorized vehicles.

## 7 Conclusion

Based on the results of the analysis of the data that has been collected, it shows that the existing green system on the pedestrian path on Jln. Kyai Tapa, Grogol, West Jakarta. Several problems were found on the pedestrian path on Jln. Kyai Tapa, Grogol, West

Jakarta, among other things related to green planning, are pedestrian paths that do not provide an exciting experience for users. There is no specific green planning concept on pedestrian paths; when seen on pedestrian paths and irregular plant arrangements, it seems that there is no concept or theme applied to the green layout of the pedestrian path.

The pedestrian path on Jln. Kyai Tapa, Grogol, West Jakarta need to make a green arrangement adapted to the area's existing conditions and social activities. As a pedestrian path whose pedestrian intensity is relatively high, the green arrangement on the pedestrian path can provide physical comfort and visual comfort to pedestrians.

The choice of plant species also needs special attention to the green layout of the pedestrian path, to avoid damage to the pavement construction due to widespread root growth, it is necessary to use tree species whose roots do not interfere with the construction. Plant heights and color variations can also be applied to the greenery of the pedestrian path to provide a spatial experience and visual comfort to pedestrians.

Moderate growth speed needs to be one of the criteria for selecting plants in a green pedestrian path. Because plant growth that is too fast will increase maintenance costs in the area. The position of the pedestrian path in the middle of a dense urban area is one factor in the need to use plants with a tight spacing of at least 3 m and use plants that can absorb polluted air.

## References

- K. Bararatin., A. Hayati, (2016). Penataan Jalur Hijau di Surabaya Berdasarkan Karakteristik Jalan dan Kemampuan Visual Pengamat Studi Kasus: Jalan Mastrip Surabaya. EMARA: Indonesian Journal of Architecture, 2(1), 1. <https://doi.org/10.29080/emara.v2i1.19>
- Ching, D.K Francis. 1993. *Arsitektur : Bentuk Ruang dan Tatahan* (edisi Kedua). Erlangga. Jakarta
- Ching, Fancis, D.K. (1979), "Architecture: Form, Space & Order", Van Nostrand Reinhold. Camp, New York.
- Chearra. 1978. *Standard Perencanaan Kota*
- Departemen Pekerjaan Umum. 1996. *Tata cara Perencanaan teknik Lanskap Jalan*. No: 033/T/BM/1996. Maret 1996. Direktorat Jenderal Bina Marga
- Echols, M. John, H. Shadily (1983). *Kamus Inggris Indonesia*. Jakarta: Gramedia. Cet. XII.
- R, Hakim, 1987. *Unsur Dalam Perancangan Arsitektur Landscape*. Jakarta: Balai Pustaka.
- C. W., Harris, N. T. Dines. (1988). *Time Saver Standarts for Landscape Architecture*. New York: McGraw Hill Book Inc.
- Hendra Saputra James ATimboeleng, M., Lalamentik, L. G., Teknik, F., Sipil, J., & Sam Ratu-  
langi Manado, U. (2019). ANALISIS KARAKTERISTIK ARUS PEDESTRIAN DI KOTA  
MANADO (Studi Kasus Jalan Samratulangi-Jalan Suprpto). *Jurnal Sipil Statik*, 7(11),  
1385–1396.
- Murdaningsih, 2010. *Evaluasi Aspek Fungsi, Estetika dan Agronomis Tanaman Tepi Jalandi Jalan Ijen Kota Malang*. *Jurnal Agricra*. 1(1)
- Rubenstein, M. Harvey 1992. *Pedestrian Malls, Streetscapes, And Urban Scapes*. New York: John Wiley & Sons, Inc.
- E. Sukoco, 2002. *Analisis Penyalahgunaan Prasarana Jalan Di Kawasan Sekitar Pasar Johar*. Skripsi FT Unes

**Open Access** This chapter is licensed under the terms of the Creative Commons Attribution-NonCommercial 4.0 International License (<http://creativecommons.org/licenses/by-nc/4.0/>), which permits any noncommercial use, sharing, adaptation, distribution and reproduction in any medium or format, as long as you give appropriate credit to the original author(s) and the source, provide a link to the Creative Commons license and indicate if changes were made.

The images or other third party material in this chapter are included in the chapter's Creative Commons license, unless indicated otherwise in a credit line to the material. If material is not included in the chapter's Creative Commons license and your intended use is not permitted by statutory regulation or exceeds the permitted use, you will need to obtain permission directly from the copyright holder.

