

## Analysis of Space Circulation in Raya Ganting Mosque, Padang City

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### Abstract

Raya Ganting Mosque is the oldest mosque in Padang City and has a role in social and religious life. The mosque has special rules related to circulation, such as avoiding meetings between males and females, which disturbs the sanctity of worship. The circulation of space in the mosque must be considered for the convenience of worshippers, where the issue in this study is still the occurrence of cross circulation in the foyer, left side entrance, and the prayer room which is closer to the entrance to the women's ablution room. This study aims to analyze the suitability of the existing space circulation in the Mosque using the theory of D. K Ching (1993). The method in this research uses the Descriptive Qualitative Method by using variables of building access, Circulation flow configuration, and relationship between space and road. The results showed that the circulation space based on the achievement of the mosque building has more than one entrance access, the flow of motion of worshippers in the mosque is accessed linearly, and the relationship between spaces has a spatial relationship through space, ends in space, and penetrates in space. In conclusion, the circulation of space in the Mosque is effective and efficient, where the achievement of the building has more than one entrance to avoid congestion of worshippers, the flow of movement of worshippers in the mosque is accessed linearly which makes it easier for worshippers to go to each room in the mosque, and the relationship between spaces through space and ends in space where good minimize cross-circulation between worshippers. However, some aspects such as the arrangement of the women's ablution room must be considered to reduce cross-circulation between worshippers, thereby increasing the effectiveness of the comfort of worshippers in worship.

**Keywords:** Space Circulation, Cross-Circulation, Raya Ganting Mosque

### Introduction

Circulation patterns are closely tied to circulation spaces, as movement within a building always passes through various areas. Circulation spaces, such as houses, buildings, public spaces, and transportation, are integral components due to their vital function (Thoriq et al., 2023). Just as humans require space to move and engage in activities, proper circulation is essential in building design (Hasibuan, 2020, in Utami et al., 2023). This is especially applicable to mosque buildings, which have specific regulations regarding circulation, such as avoiding intersections between male and female paths or cross-circulation, which can disrupt the sanctity and order of worship (Wirawan & Bahar, 2023)

Raya Ganting Mosque is the oldest mosque in Padang, West Sumatra, built in the 19th century, and plays a significant role in the social, religious, and cultural life of the local community (F. Putra & Fatimah, 2022). As a center for Muslim activities, this mosque serves not only as a place of worship but also as a gathering space for the community to engage in religious and social activities (A. Putra & Rumondor, 2019). However, circulation issues have emerged at Raya Ganting Mosque, such as cross-circulation in the mosque's veranda and between the paths leading to the women's ablution area and the men's prayer hall, as well as a lack of clear directional signage. This has confused new worshippers in locating and distinguishing between the men's and women's ablution areas, which impacts the comfort and smooth flow of worship activities.

According to one of the administrators of Raya Ganting Mosque, research on space circulation within the mosque is necessary to enhance the comfort of worshippers during their prayers, considering the mosque's long history in the development of Padang City. To create a comfortable and well-functioning physical environment, it is important to evaluate the effectiveness of space circulation in this mosque to support the comfort of worshippers and the smooth flow of worship activities.

Based on the description above, the question that arises is how to suitability an appropriate and effective space

circulation in the mosque. Which aims to find a fit that makes the circulation of space at the Raya Ganting Mosque more effective. This is important for creating comfort and facilitating the movement of worshippers, especially during worship and other activities within the mosque. The arrangement of spaces in the mosque should support effective and efficient circulation to avoid disrupting worship activities and social events taking place inside.

## **Literature Review**

Circulation is a combination of journeys towards a destination. There are two types of circulation: Vertical and Horizontal. In the book *Architectural Theory* (1993) by Francis D.K. Ching, as cited in Marua et al. (2020), circulation is described as a 'thread' that connects one space to another, creating harmony (Wildan & Raidi, 2023). The following are the elements of circulation according to Francis D.K. Ching (1993):

### **1. Building Access**

A space has a profound connection to where we originate our movement and the direction of our intended destination. Circulation also serves as a means to facilitate our movement from one place to another, making its function to connect one room with another. We experience space when we are within it and when we establish a destination (Mahardika, 2019), in Sasmito et al., (2023). Building access is the initial stage of a circulation system, where we are prepared to see, experience, and use the spaces within the building. The approach to a building and its entrance may vary in terms of distance, ranging from a few steps to brief spaces, to longer and winding paths (Masrul & Samra, 2021).

### **2. Circulation Flow Configuration**

The continuity and scale of each path at an intersection can help us differentiate between the main routes leading to primary spaces and secondary routes leading to secondary spaces. If the paths at an intersection are balanced with one another, sufficient space must be provided to allow people to pause momentarily (Nabilah et al., 2018). Circulation flow configurations are divided into several types of movement patterns, including Linear Circulation Flow, Radial Circulation Flow, Spiral Circulation Flow, Grid Circulation Flow, and Composite Circulation Flow (Ritonga et al., 2021).

### **3. The Relationship Between Space and Road**

According to Francis D. K. Ching (1993) in Pynkyawati et al. (2016), the relationship between space and road also affects the accessibility of areas, and each room has varying levels of privacy. Paths and areas can be combined in various ways, such as Passing Through Spaces, Penetrating Spaces, and Ending Within Spaces (Wicaksono et al., 2020).

Circulation in a mosque is certainly important, as the comfort of users may be affected. Therefore, when entering the mosque area, the pathways for men and women should be clearly defined, with distinct signs and separate routes to follow. This is essential to prevent misunderstandings regarding timing and circulation between male and female worshippers (Aliya & Yuli, 2021). According to SNI 03-1733-2004, comfort criteria involve providing comfort that includes ease of communication, both internal and external, ease of access to reach a location or object, and especially ease of movement concerning the equipment, infrastructure, and resources provided by the environment (Lathifah et al., 2023).

Circulation is closely related to comfort. Poor circulation can have significant consequences for its users. Several factors can contribute to a negative experience during movement, For example, this may include long distances to the destination, inadequate distribution of movement between people and vehicles, or a mix of various elements, such as business traffic between cars and motorcycles, for example, this may include long distances to the destination, inadequate distribution of movement between people and vehicles, or a mix of various elements, such as business traffic between cars and motorcycles. or going back and forth between men and women in the mosque (Hakim, 2006, in Wirawan & Bahar, 2023).

## **Methods**

The space circulation at Raya Ganting Mosque utilizes a descriptive qualitative method. The qualitative method is a data collection approach that involves direct observation at the research site being studied (Waruwu, 2022). Qualitative research itself is descriptive so the theoretical basis is often used as a source of reference when making direct observations, and conducting interviews with mosque administrators or worshipers regarding the space of circulation in the mosque is also included in the qualitative method (Zaluchu, 2021), by obtaining primary data sources through observation and documentation, as well as secondary data through interviews.



Figure 1. Raya Ganting Mosque (Analysis, 2024)

Raya Ganting Mosque is located at Jalan Ganting No. 3, Ganting Parak Gadang, East Padang District, Padang City,

West Sumatra. The population in this research is the Raya Ganting Mosque as the research object with spatial circulation in the mosque as the main focus.

Samples are usually the number and characteristics of the population (Sugiyono, 2011) in Mouwn Erland, (2020). Before determining the research sample, first determine the selection criteria in the sample selection method as a consideration that has been adjusted to the predetermined criteria and will be adjusted to the variables used. After selecting the sample, eight samples were obtained which will be studied later, including:

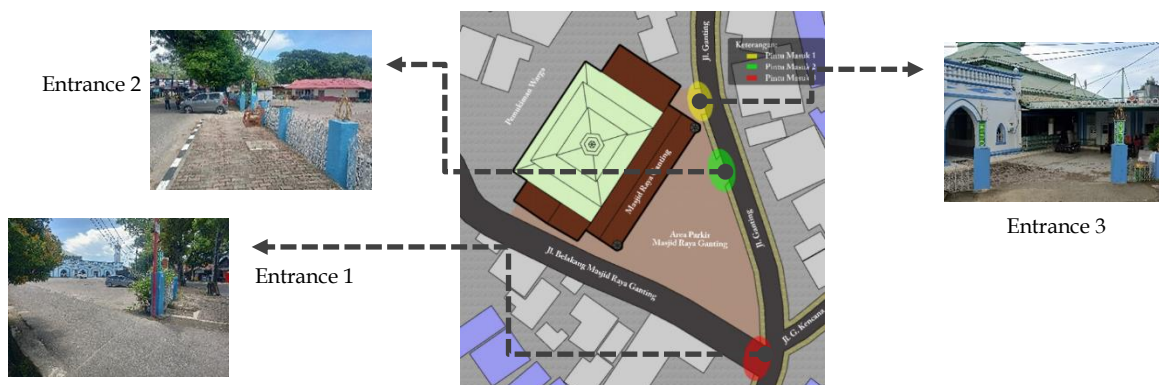
1. Parking lot
2. Front Porch
3. Right Porch
4. Left Porch
5. Male Ablution Room
6. Female Ablution Room
7. Male Prayer Room
8. Female Prayer Room

The research variable is a value or characteristic of individuals, objects, or activities with variations that have been determined by researchers to be studied and conclusions can be drawn (Sugiyono, 2011) in Agustian et al., (2019). The variables in this study use the theory of France D. K Ching (1993) on spatial circulation that uses variables of Building access, Circulation flow configuration, and The relationship between space and path.

## Results and Discussion

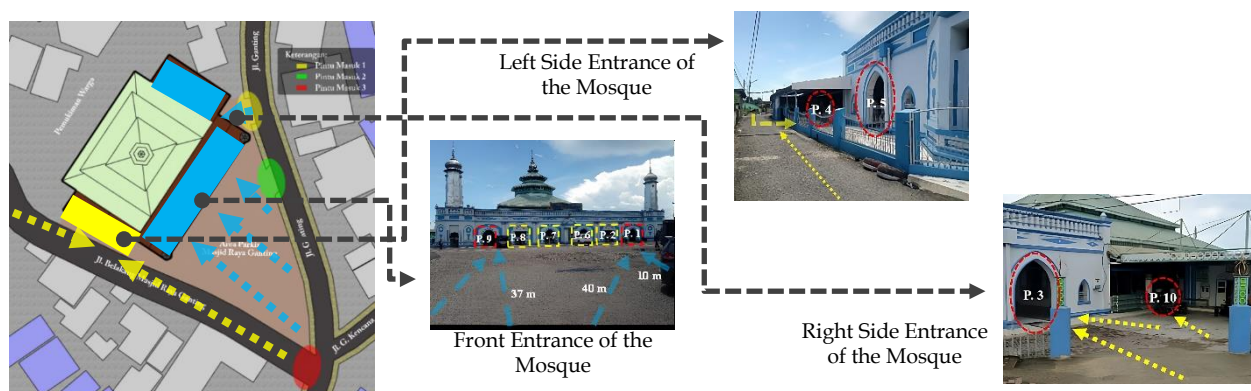
### 1. Building's Access Has One or More Access Entrances

Raya Ganting Mosque is located on the side of the Ganting road, with 3 entrances that lead directly to the mosque parking area (Entrances 1 and 2 are accessed by mosque worshippers, entrance 3 is accessed by worshippers and residents who live in the area behind the mosque).



**Figure 2.** Attainment of Mosque Area Entrance (Analysis, 2024)

Access to the mosque building is accessed directly from 3 entrances to the mosque area, as well as from the mosque parking area. Making the distance to reach the mosque area relatively easy to exit and enter the mosque area. Three entrances to the mosque area allow an even distribution of the flow of worshippers entering the mosque and also reduce the potential for congestion at one point of the mosque area entrance. Raya Ganting Mosque has about 10 entrances. Based on observations and information obtained from the mosque management, there are 5 main entrances to the mosque that are opened every day and the remaining 5 are opened on certain days when the mosque is crowded.

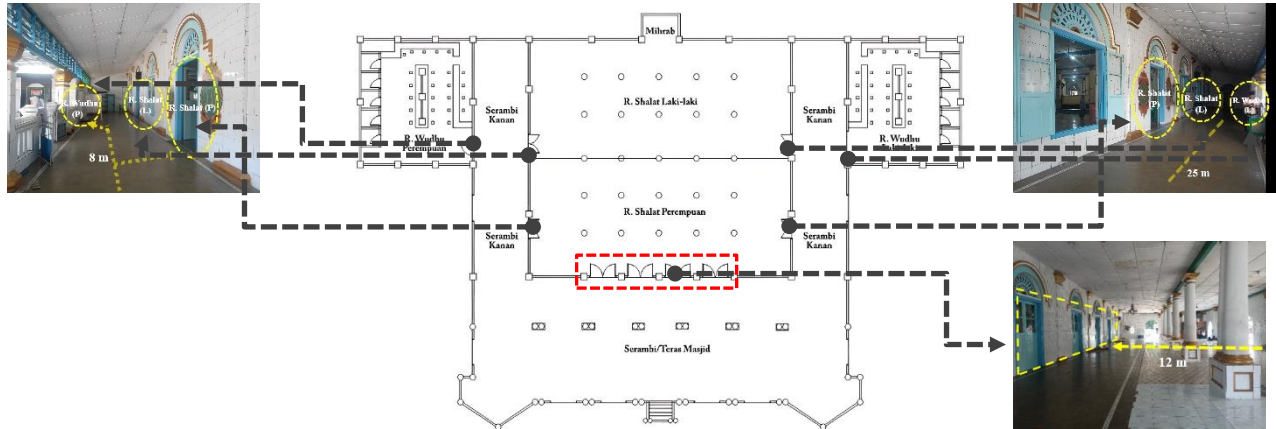


**Figure 3.** Mosque Entrance access (Analysis, 2024)

Masjid Raya Ganting has six entrance doors at the front, with two main doors that are opened daily, while the other four are opened during peak times when the mosque is crowded. The door on the right side is designated for male worshippers, while the door on the left is reserved for female worshippers. This division provides a more orderly and

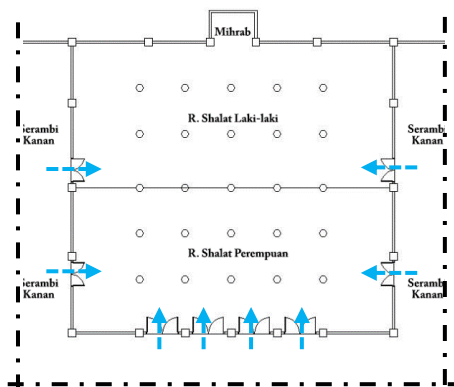


directed flow of movement, minimizing the possibility of cross-circulation between male and female worshippers. The distance from the parking area to the front entrance, which ranges from 10 to 40 meters, is included in the comfortable category for worshippers. The door on the left side, which is opened every day, facilitates access for worshippers who live in the back area to enter the mosque. On the right side of the door, to facilitate administrators and worshippers who use motorcycles can park their motorbikes in the parking area on the right side of the mosque, at a distance of only 2 meters from the parking area, which can support the smooth activities of mosque administrators and the circulation of worshippers as a whole.



**Figure 4.** Attainment of Entrance to Prayer Room and Ablution Room of the Mosque (Analysis, 2024)

The spatial layout of the mosque prioritizes the regularity of circulation and privacy of worshippers, by the principles recommended in Islam and hadith. The separation of ablution rooms and prayer rooms for men and women, as well as a measured distance, creates comfort and convenience for worshippers in carrying out worship. The achievement of ablution room and the male prayer room is quite close together, with an achievement distance of about 25 meters from the entrance, supporting efficient flow of movement and avoiding confusion or congestion of worshippers. The close access between the ablution room and the women's prayer room with a distance of about 7-8 meters allows female worshippers to move quickly and smoothly without passing through other spaces. However, there is cross-circulation between worshippers because the distance of the female ablution place is closer to the entrance of the male prayer room than the entrance of the female prayer room. Therefore, a clearer arrangement is needed to avoid meetings between male and female worshippers, in accordance with the recommendation of the Prophet Muhammad SAW regarding privacy areas in the mosque. The entrance to the front prayer room, which is only opened when the mosque is crowded, shows wise management, where this door functions to overcome the surge of worshippers, reduce congestion, and maintain smooth movement.



**Figure 5.** Attainment of Prayer Room Entrance (Analysis, 2024)

The entrance to the prayer room in the mosque amounts to 8 entrances with 2 entrances for male worshippers and 6 entrances for female worshippers. With the number of entrances that are more than two, it can avoid the congestion of worshippers when going in and out of the prayer room.

The analysis carried out on the achievement of the mosque is quite effective. Having access to more than one entrance at the front, right, and left of the mosque to avoid the accumulation of worshippers at the entrance to the mosque, the distance of achievement between spaces that are closely spaced makes it easier for worshippers to reach the space in the mosque. This is in accordance with the hadith, which recommends moving calmly and orderly towards the place of prayer. With access to more than one entrance and a fairly short distance to reach, the congregation can enter the mosque without rushing or jostling, maintaining calmness and solemnity when heading to the prayer room. However, access to the women's ablution area is somewhat disturbed because the entrance to the ablution area is closer to the entrance to the men's prayer room compared to the entrance to the women's prayer room, which disrupts the comfort of the privacy area for female worshippers.

## 2. Linear Circulation Motion Flow Configuration

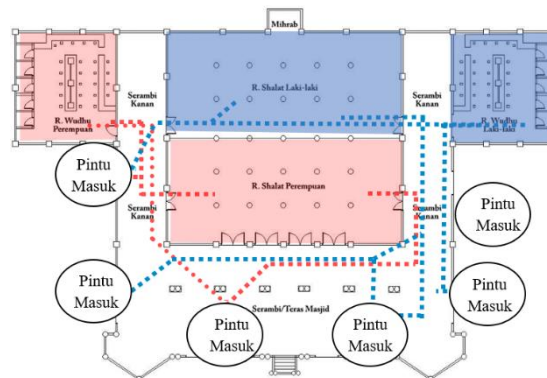
The flow of movement of visitors or worshippers of the Raya Ganting Mosque can be seen from the beginning of entry into the mosque area. Where the mosque parking lot is the beginning of the movement of worshippers to enter the mosque.



Description:  
Movement of Female Worshippers ■■■  
Movement of Male Worshippers ■■■  
Mosque Entrance ———

**Figure 6.** The flow of the congregation entering the mosque (Analysis, 2024)

The flow of congregation movement at all mosque entrance accesses is accessed linearly from the mosque entrance and the mosque parking area. However, the movement flow at the left entrance is slightly disrupted, as male worshippers must first take a detour to reach the ablution room or can enter through the left side entrance but must go into the prayer room first.



Description:  
Movement of Female Worshippers - - -  
Movement of Male Worshippers - - -

**Figure 7.** Linear Circulation Movement Flow in the Mosque (Analysis, 2024)

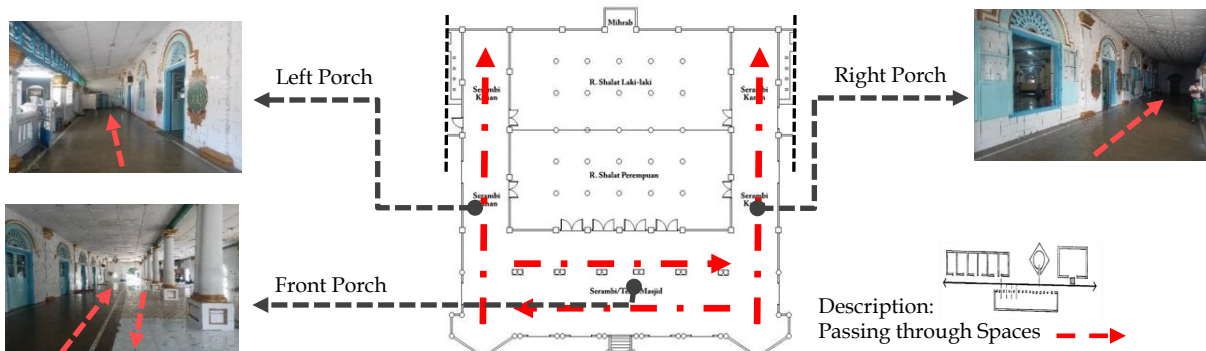
The flow of movement of male worshippers and female worshippers in the mosque based on D. K. Ching is quite effective because the flow of movement of worshippers is arranged linearly to minimize the potential confusion and density that might occur. Linear motion flow also allows organizing more effective and efficient movement, both when entering the mosque, passing through the mosque foyer, heading to the ablution place, or heading to the prayer room, as well as when finishing the prayer and wanting to leave the mosque. In Islamic principles, an organized flow supports the orderliness of prayers, allowing congregants to easily access the ablution area and the prayer room, filling the empty rows neatly without jostling, in accordance with the recommendation of the Prophet Muhammad to maintain order in carrying out prayer. Facilitate worshippers in worship without spending time looking for ablution or prayer space where the ablution room and prayer room are quite close together.

### 3. Relationship Between Spaces in the Mosque

The relationship between spaces at the Raya Ganting Mosque refers to how the relationship between one space and another in its effectiveness and efficiency, and can also facilitate the movement of worshippers in the mosque.

#### a. Passing through Spaces

The relationship between spaces or roads at the Raya Ganting Mosque is also one aspect that must be considered for the effectiveness of the circulation of space in the mosque.



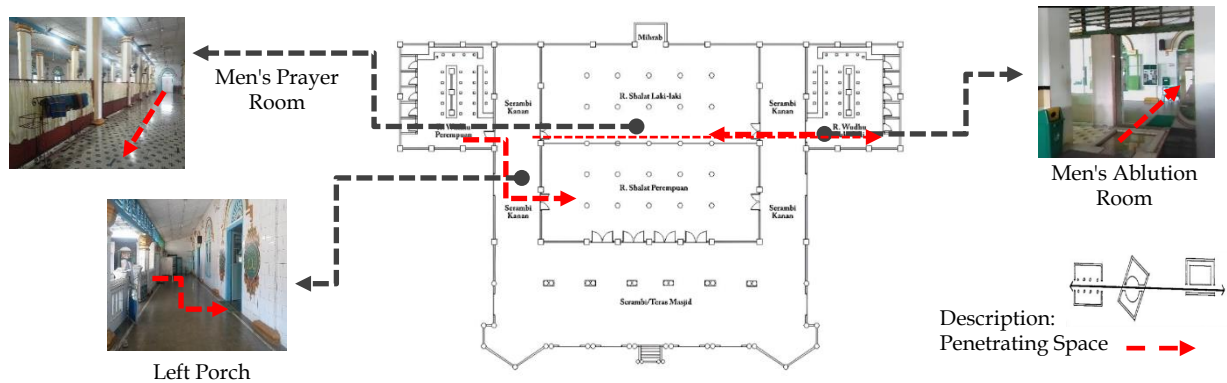
Description:  
Passing through Spaces - - -

**Figure 8.** Space Relationship at the Mosque (Analysis, 2024)

The foyer of the mosque also functions as an additional place to pray when the main prayer space is insufficient. Based on observations in the context of the relationship between spaces, male and female worshippers pass through the prayer room when the congregation goes to the mosque ablution room and vice versa. The relationship between spaces by passing through the space at the Raya Ganting Mosque is effective. Where the relationship of space through space is arranged quite effectively and makes it easier for worshippers to access the prayer room, ablution room, and mosque foyer effectively and efficiently. However, it still maintains the sanctity of the relationship between the prayer room and the supporting spaces in the mosque. This is in accordance with the teachings of Prophet Muhammad SAW, which recommend the separation of spaces between male and female worshippers, including in the flow of movement toward the ablution areas. This arrangement is intended to avoid cross-circulation that could invalidate a worshipper's ablution if they come into contact with a non-mahram (someone unrelated by close kinship). The relationship between spaces through space can maintain the sanctity of the prayer room as a sacred place of worship can be maintained.

b. Penetrating Spaces

The relationship between spaces or roads at the Raya Ganting Mosque is also one aspect that must be considered for the effectiveness of the circulation of space in the mosque. One of the relationships between spaces or roads is a road that can penetrate space based on its axis, tilted on all sides, in cutting space, causing patterns of rest and movement in space.

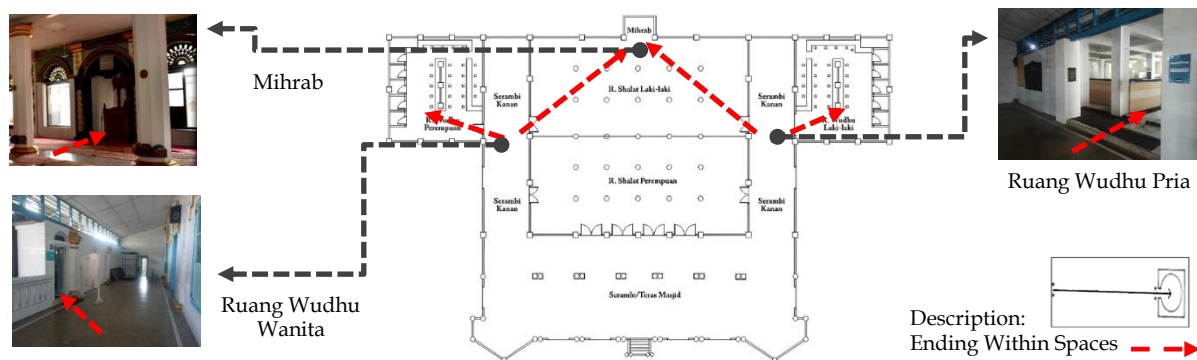


**Figure 9.** Space Relationship at the Mosque (Analysis, 2024)

The relationship between space through space in the prayer room and ablution room for men and women is still less effective and must be considered to increase the privacy and comfort of worshippers. The male ablution room and the prayer room are connected by a right porch that functions well as a transition area, but the left porch connecting the ablution room and the female prayer room still has cross-circulation between male and female worshippers. The clear separation between male and female areas is still not effective, because cross-circulation still occurs, especially in the left porch which can be accessed by male worshippers where ideally, the women's ablution room should be closer to the women's prayer room to maintain privacy and comfort of worship in accordance with the recommendations in Islamic teachings. The need for a firmer separation of lanes and a more structured spatial arrangement needs to be done to prevent cross-circulation between male and female worshippers and to maintain comfort in worship so that the movement of worshippers is more effective and efficient.

c. Ending Within Spaces

The relationship between spaces or roads at the Raya Ganting Mosque is also one aspect that must be considered for the effectiveness of the circulation of space in the mosque. The relationship between spaces or roads ends in a space where it is enough to determine the relationship between roads or spaces used in entering the space functionally and symbolizing important spaces.



**Figure 10.** Space Relationship at the Mosque (Analysis, 2024)

The mihrab in the mosque's main prayer space serves as a key element in the relationship between spaces. As the "space within the space" and the "space that ends in the space," the mihrab becomes the focal point that directs worshippers towards the qibla, helping to maintain concentration and clarity of direction in worship. The mihrab plays an

important role in the visual and spiritual hierarchy of the mosque space, ensuring that worshippers perform prayers according to the legal requirements of Islam. In addition, the left and right porticoes of the mosque serve as transition areas that connect worshippers to the male and female ablution rooms, facilitating efficient movement between worship spaces. Thus, the mihrab and portico play an important role in maintaining order and convenience for worshippers in performing the prayer service.

The relationship between spaces at the Raya Ganting Mosque is quite effective in terms of connecting worship spaces, especially through the right, front, and left porches which function as transition spaces. This facilitates the movement of worshippers and increases the efficiency of time in worship, both in congregation and individually. However, it is necessary to separate the space between male and female worshippers to avoid cross-circulation that occurs in some areas, such as the left porch which can be accessed by male worshippers. This reduces the privacy and comfort of female worshippers, who ideally need a more separate space to worship in peace. To improve the effectiveness of the relationship between spaces and maintain the privacy area of the congregation, a clearer separation between male and female paths is needed, including placing the women's ablution room closer to the women's prayer room. This is in accordance with Islamic rules that recommend the separation of space between male and female worshippers so that the comfort and privacy of worshippers can be maintained.

**Table 1.** Recapitulation of Research Results (Analysis, 2024)

Variables	Parameters	Analysis
Building's Access	1. Has one or more entrances to the mosque.	<ol style="list-style-type: none"> <li>1. Accessibility at the Mosque is quite effective with more than one entrance, it can avoid density and make it easier for worshippers to reach the mosque room.</li> <li>2. Well-organized access as recommended by the hadith, making the congregation move calmly and orderly.</li> <li>3. Access to the women's ablution room needs to be considered because it is located closer to the entrance of the men's prayer room, which interferes with the privacy of female worshippers.</li> </ol>
Circulation Flow Configuration	1. It has a linear circulation flow that is minimal and time-efficient.	<ol style="list-style-type: none"> <li>1. The flow of movement of worshippers at the Mosque which is linear is quite effective and efficient. Minimize the density and confusion of worshippers, both when entering the mosque, heading to the ablution place, prayer room, and leaving the mosque.</li> <li>2. In Islam, this orderliness supports the smoothness of prayer, making it easier for worshippers to fill the shaf neatly without crowding.</li> </ol>
Relationship Between Space and Path	<ol style="list-style-type: none"> <li>1. The relationship between the space passing through the space and ending up in the space is effectively organized.</li> <li>2. The Spatial relationships that extend across space are less effective because the arrangement of women's ablution spaces still occurs cross-circulation between congregations.</li> </ol>	<ol style="list-style-type: none"> <li>1. The relationship between the space passing through the space and ending up in the space is effectively organized.</li> <li>2. Space relationships are penetrating in space is less effective, where the arrangement of the women's ablution room is closer to the entrance to the men's prayer room, causing cross-circulation on the left porch, which is not in accordance with Islamic principles.</li> </ol>

## Conclusions

Space Circulation at the Raya Ganting Mosque of Padang City, based on the theory of France D. K. Ching (1993) on circulation that takes aspects of building access, configuration of the flow of motion, and the relationship between spaces or roads that are implemented into the circulation of the existing prayer space at the Mosque. The conclusion that can be drawn is that the circulation of the existing prayer space at the Raya Ganting Mosque is effective, where the achievement of the mosque is supported by a large number of entrances to the prayer room and other spaces when entering the mosque so that it is sufficient to avoid the accumulation of worshippers when entering or leaving the mosque. The flow of



congregational movement is also quite effective where the movement of worshipers into the prayer room and other spaces is accessed linearly or directly. The relationship between spaces through space and ends in space is also quite effective where good space relationships minimize cross-circulation between worshipers. However, the relationship of space through space is still less effective, where the arrangement of the women's ablution room still needs to be improved so that it is closer to the entrance to the men's prayer room, causing cross-circulation on the left porch of the mosque. Therefore, it is necessary to rearrange the ablution room for women to avoid cross-circulation between worshipers.

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