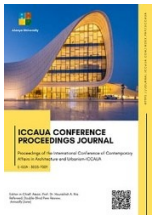

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# Design Strategies to Prevent Sexual Harassment at Public Transportation Nodes: A Case Study of Transit-Oriented Development Areas in Bangkok, Thailand

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**A b s t r a c t**

One in three women and one in six men experience sexual harassment, which is still a widespread problem. The study employs the conceptual frameworks of Crime Prevention Through Environmental Design (CPTED) and Transit-Oriented Development (TOD) to investigate Bangkok's public transit system and communities susceptible to sexual offenses. By examining crime statistics and environmental variables, the research pinpoints areas at risk of sexual crimes. This study applied physical analysis of public transportation development areas to identify appropriate locations and construct questionnaires to inquire about public perceptions of safety. The findings demonstrate that poorly planned public places, such as dark locations and isolated sidewalks, raise the crime rate and heighten feelings of unsafety. Low visibility and insufficient surveillance also raise perceived and actual dangers. The study helps create appropriate design guidelines and emphasizes the need for gender-inclusive urban planning to develop safe and socially equitable areas in Bangkok's future public transit zones.

**K e y w o r d s :** Urban safety, Mass rapid transit, Sexual crime.

## 1. Introduction

### 1.1 Background and Context

Unfortunately, sexual harassment is still a pervasive worldwide issue that cuts beyond national boundaries, cultural norms, and socioeconomic standing. It is still accepted in .many parts of the world, especially in public places, despite continuous social progress. According to disturbing statistics, one in six men and one in three women worldwide have been the victim of sexual harassment at some point in their lives (Joshi, 2024). Furthermore, the bulk of crimes are undetected, which means that most of the offenders avoid punishment (World Population Review, 2024). Particularly dangerous places are public settings, such as transit hubs.

Nine out of 10 women worldwide report feeling insecure in urban settings, particularly in dimly lit or remote locations like parks, alleys, bridges, and public transit hubs (Frontmedia Studio Limited, n.d.). Sexual harassment in public settings, including transportation systems, has been well-recorded in several nations, including South Africa, India, and Japan. These trends show that sexual harassment is still a prevalent urban hazard despite various legislative frameworks and cultural standards.

These problems are not restricted to Thailand. Gender inequality and patriarchal cultural legacies still shape attitudes and actions. According to reports, there is a broad range of violence against women in Thailand, ranging from rape and murder to domestic abuse (Somhar, 2023). The Women and Men Progressive Movement Foundation reports that the victim knew the offender in more than 46% of cases. Public areas have also been found to be hotspots for harassment, especially those around public transportation hubs (Prachathai, 2019). Given that gender insecurity in urban and transportation contexts is a social and geographical issue, this directly contributes to the development of the study framework.

### 1.2 Problem Statement and Research Gap

The architecture of urban public space, including mass transportation hubs, received significantly less attention than the many international attempts to eliminate gender-based violence through law and policy change. Research on the

built environment as a cause and potential remedy for sexual harassment offenses is noticeably lacking, with the majority of studies focusing on the psychological, legal, or economic aspects of the crime.
There are very limited spatial policies and urban planning techniques in Thailand that try to stop or lessen harassment in areas used for public transportation. Safety-by-design strategies are not fully integrated into current legislation, particularly in crowded urban areas affected by the growth of public transit. This study finds a notable gap in Bangkok's transit-oriented development (TOD) zones, which are still expanding: In what ways do these spaces' layout and design increase or lower the likelihood of sexual harassment?

### 1.3 Objectives and Hypotheses

The purpose of this study is aimed at the connection between sexual harassment incidences in Bangkok's TOD neighborhoods and urban form and spatial design. In addition to suggesting planning and design interventions to build safer, more inclusive urban places for women and disadvantaged groups, it aims to pinpoint particular environmental and spatial elements that contribute to insecurity at public transit hubs.
1. To identify urban surroundings of mass transit station locations that have an influence on sexual harassment is one of the study's main goals.
2. To provide architectural principles and urban planning regulations that reduce sexual harassment in places around public transportation stations.
These goals stem from the theory that the risk of harassment in TOD zones is strongly impacted by the physical layout, illumination, visibility, accessibility, and land use patterns. By examining these components, the study advances our knowledge of how gender-sensitive urban planning might be used as a preventative measure against sexual assault.

### 1.4 Significance and Structure of the Paper

There are several reasons why this research is important. It first tackles a critical public safety and human rights problem by examining how the built environment may either support or impede gender equality. Second, by providing a case study from Thailand that may help guide international conversations on gender-inclusive cities, it adds to the body of research on urban planning and design. Thirdly, it gives policymakers, planners, and designers useful tactics for incorporating safety features into the expanding field of mass transportation projects.
This study provides current insights that bridge the gap between urban planning theory, public policy, and gender studies, especially in light of Bangkok's rapidly growing TODs and the capital's continuous struggle with gender-based violence.

## 2. Understanding Sexual Harassment in Public Spaces and Transportation in Thailand: Risks, Environmental Factors, and Urban Design Solutions

### 2.1 Sexual Harassment in Public Spaces and Public Transportation in Thailand

The problem of sexual harassment in Thailand's public places and transit systems has grown more urgent, particularly in cities like Bangkok where there is a significant dependence on public transportation. Thailand was listed as the ASEAN nation where women faced sexual harassment the most often, according to a 2019 research by The ASEAN Post. The study, which was based on a survey of 1,107 people, discovered that the most common places for sexual harassment occurrences were public transit (27%), nightclubs (18%), schools (17%), and other public places (29%). Among the forms of harassment were verbal remarks (42%), flashing (35%), and sexual assault (44%).
These numbers highlight the fact that public transit networks, which are meant to be places of mobility and inclusivity, can frequently turn into dangerous places, especially for women and other vulnerable groups. This issue is made worse by unkempt urban infrastructure, particularly pedestrian networks that are unconnected, poorly lit, and unmonitored, all of which make sexual crimes more likely (Noichan & Dewancke, 2018). Even while certain urban design techniques—like ramps, elevators, and better lighting—have been used to increase accessibility and visibility, many places still lack enough safety elements. More than 45% of sexual harassment incidents have place on or close to public transportation, according to ThaiHealth (2018).
In addition, a 2017 poll by Bangkok's Assumption University revealed that out of 1,654 people who used public transit, more than 35% had been the subject of sexual harassment, with women reporting a notably higher victimization rate (45%). Public buses accounted for 50% of these occurrences, with motorbike taxis coming in at 11.4%, normal taxis at 10.9%, vans at 9.8%, and the BTS Skytrain at 9.6% (BBC News Thai, 2017). Visual harassment, such looking at women's bodies or peeking beneath skirts, and bodily harassment, like touching or rubbing up against someone, were examples of harassing practices.

### 2.2 Environmental Risk Factors for Sexual Crimes in Public Spaces

The risk of sexual harassment or assault in public places is greatly influenced by situational and environmental factors. Locations with inadequate illumination, abandoned buildings, and small or unconnected alleys are frequently designated as hazardous, according to the "First Pin" project, a community-driven initiative that identifies high-risk places for sexual harassment in Bangkok. According to the research, 15% of danger zones were designated as "blind areas," or places that are difficult for onlookers to see, while 23% of identified risk zones lacked adequate illumination (Prachatai, 2019).
Secluded or dark locations make it harder to see, which gives criminals more chances to act undetected. Particularly when there are few escape routes or resources available, victims in these places may feel alone or vulnerable. For

example, people—especially women—may become more susceptible in alleys and sidewalks that are dimly lighted or blocked by overgrown foliage, billboards, or unlicensed street sellers (Ceccato & Loukaitou-Sideris, 2020). The risk is further increased by the fact that these places frequently do not have active observation by official authorities (like the police) or unofficial observers (like the locals or pedestrians).

These settings discourage people from using public transportation or locations during specific hours, especially at night, and add to a general feeling of unease. As a result, dangerous environmental circumstances not only make crimes more likely to happen, but also make it more difficult for urban infrastructure to be inclusive and functioning.

### 2.3 Crime Prevention Through Environmental Design (CPTED)

The use of Crime Prevention Through Environmental Design (CPTED) is one of the most practical and successful approaches to addressing sexual assault in urban contexts, particularly in public transit situations. With its roots in a multidisciplinary approach that blends criminology, architecture, and urban planning, CPTED seeks to lessen the likelihood of crime by managing the built environment with purpose and continuously (Design for Security, n.d.).

Natural monitoring is a fundamental tenet of CPTED that highlights the role that visibility plays in discouraging criminal activity. Potential offenders are less likely to act when areas are planned to be open and well-lit, with clear sightlines, transparent barriers like glass walls, and few visible impediments like overgrown vegetation. This is because they are more likely to be noticed. Particularly along walkways, at station entrances, and in parking lots—where people frequently feel most vulnerable—lighting is essential.

Natural access control, which uses physical components to gently direct movement and limit access to certain locations, is a notion that complements visibility. In order to direct foot traffic along safe, active paths and discourage access into remote areas that are more difficult to monitor, a place can be influenced by pathways, fences, signs, and restricted entry points. By taking these steps, the likelihood that an offender will discover a secret location to conduct a crime is decreased.

Additionally, CPTED includes territorial reinforcement, which describes how environmental signals, such clear signage, color-coded zones, or unique landscaping, may indicate the limits of public, semi-public, and private areas. Users are more likely to feel accountable and a part of a location when they can immediately understand its purpose and ownership. People are more vigilant in the neighborhood and take pleasure in keeping a safe environment, which is a result of this sense of ownership. Community gardens, public art, and tidy, well-maintained environs may all quietly convey that a place is well-maintained and, consequently, that disobedience will not be accepted.

Activity support, which focuses on creating spaces that encourage frequent and constructive usage, is another essential component. The natural presence of people tends to deter undesirable conduct in spaces that are regularly busy, such as plazas with cafés, outdoor markets, or spaces intended for cultural activities. As foot traffic rises, so does informal monitoring. In addition to making the space more lively, providing facilities like benches, sports fields, or stages for neighborhood performances guarantees that time and space are used constructively, which reduces the likelihood of disruptive behavior.

Finally, maintenance functions as a tangible and symbolic deterrent to criminal activity. A room that is kept clean and well-maintained conveys the idea that it is routinely handled, appreciated, and watched. Not only does fixing problems like broken lighting, graffiti, garbage, or vandalism make the neighborhood seem better, but it also promotes a respectful and watchful culture. On the other hand, abandoned areas could suggest that no one is around, which could encourage antisocial behavior.

Overall, stations and the surrounding regions may become safer, more welcoming public places if CPTED concepts were included into the design of transport systems, especially in metropolitan settings like Bangkok. CPTED makes public transportation more accessible and comforting for everyone in society by emphasizing visibility, control, community presence, and routine maintenance. This builds an urban fabric that inherently deters sexual harassment and other types of violence.

### 2.4 Transit-Oriented Development (TOD) and Sexual Safety

Transit-Oriented Development (TOD) is a kind of urban planning that emphasizes building mixed-use, high-density projects around easily accessible public transit destinations. Although TOD is frequently praised for its effectiveness and sustainability, it's also critical to take sexual safety into account in order to create truly inclusive and inviting spaces for everyone. To make sure that these urban areas can benefit everyone without making people feel afraid or vulnerable, especially women and marginalized groups, it is essential to incorporate secure, accessible, and effective transportation systems (Ceccato & Loukaitou-Sideris, 2020).

Safety should always be considered while designing TOD environments. This entails giving priority to features that improve accessibility and visibility. For example, removing blind spots and establishing clear sightlines across transit areas—whether at stations or along pedestrian pathways—can greatly lower the likelihood of harassment. These areas also need to have adequate lighting since well-lit areas serve as deterrents to prospective criminals in addition to increasing users' sense of safety. The presence of "eyes on the street," or local citizens or business owners providing unofficial monitoring that inherently discourages criminal activity, is another way that mixed-use buildings around rail hubs may enhance safety.

In addition to being visible, TOD places must use inclusive urban design to meet the unique needs of women and other vulnerable groups. Design elements like family-friendly places, monitored waiting areas, clean and accessible toilets, and designated safe zones, for instance, can all help to increase safety for these populations. Planning that is gender-sensitive makes sure that the particular safety concerns of different groups are taken into account, which promotes inclusion and a greater usage of public transportation.

Designing safe spaces, however, calls for community involvement in addition to physical infrastructure. Public seminars, discussions, and surveys should all be a component of TOD planning in order to assist officials comprehend local safety concerns and provide customized solutions. Involving the community in these procedures enables a more sophisticated comprehension of the difficulties encountered in particular regions and gives locals the ability to actively participate in preserving safety. Campaigns for public awareness and training in bystander intervention can also provide people the skills and self-assurance they need to take action when they see harmful conduct.

To sustain safety in TOD contexts, a robust policy and law enforcement framework is crucial, in addition to community participation. To foster a culture where people feel safe, security guards, monitoring equipment, and clear procedures for reporting sexual harassment are essential. Furthermore, equipping transit locations with emergency communication devices like help kiosks, call buttons, or smartphone applications guarantees that people can quickly report problems or get assistance when they need it.

One cannot overlook the contribution that technology makes to improving sexual safety. Contemporary developments like smartphone reporting applications, CCTV cameras, GPS monitoring of transit vehicles, and panic buttons may be incorporated into the urban fabric to enhance crime prevention and effectively address events when they do occur. These digital solutions make public transportation networks safer for everyone by lowering criminal possibilities and guaranteeing prompt responses.

In the end, combating sexual harassment in metropolitan areas and public transit—particularly in places like Bangkok—requires a multipronged strategy. The issue is made worse by elements including inadequate illumination, disjointed infrastructure, and inadequate surveillance. Nonetheless, the ideas included into frameworks such as CPTED and TOD are viable ways to rethink transportation surroundings, creating safer, more welcoming areas that inspire people to utilize them fearlessly. We can turn dangerous transit zones into safe, powerful places by using gender-sensitive design, utilizing community feedback, and integrating contemporary technology. Urban transit networks may develop into the foundation of secure, just, and sustainable communities with the dedication of all parties involved.

### 2.5 Conceptual framework

According to the literature review, most factors contributing to unsafe mass transit station areas are related to urban physical conditions and ineffective urban policies. In particular, Thailand faces challenges in law enforcement and regulatory effectiveness, while the built environment often suffers from poor lighting, isolated or neglected areas, and limited accessibility to facilities and services. These conditions create opportunities for sexual crimes to occur in transit spaces.

This study proposes a conceptual framework that integrates principles from Crime Prevention Through Environmental Design (CPTED) with Transit-Oriented Development (TOD) to create safer and more inclusive transit environments. CPTED principles emphasize natural surveillance, adequate lighting, visibility, and safe connectivity, while TOD supports active, high-density, and mixed-use areas around transit stations, increasing passive monitoring through public presence and activity.

The framework also highlights the importance of inclusive urban design that considers the needs of vulnerable groups such as women, children, and the elderly. It calls for greater community engagement in safety planning, improvement of policies and legal enforcement, and the use of technology—such as CCTV, emergency reporting applications, and smart lighting systems—to enhance safety in transit environments.

By addressing both environmental and policy dimensions, this integrated approach aims to reduce the risk of sexual violence and promote the development of safer, more equitable urban transit spaces for all.

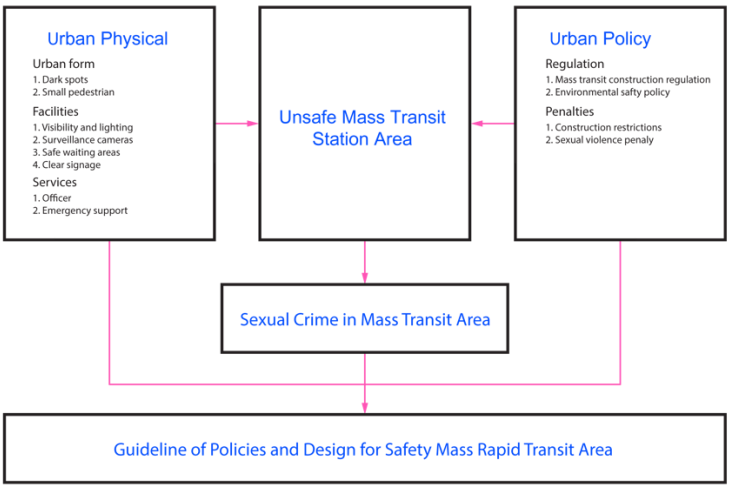


**Figure 1.** Conceptual Framework (Developed by Author).

## 3. Methods of Study

### 3.1 The scope of study area

The problem of sexual harassment in Bangkok's residential neighborhoods that are connected to public transit is the main topic of this study. Because residential areas are more likely to experience criminal activity, particularly during temporary or nocturnal activities, they are given priority over commercial districts. Data indicates that residential regions have a greater prevalence of sexual assaults, even if business zones like Siam Station may have blind spots due to

infrastructure design. In order to identify high-risk locations for further research and preventative design recommendations, this study uses a set of criteria.

At first, the districts of Bang Sue, Phaya Thai, and Pathumwan were chosen for analysis. A variety of residential types and dense transportation infrastructure are evident in these districts. To determine which district would be best for the study, the following criteria were applied:

1. Bang Sue is a major transport hub linking central Bangkok to Pathum Thani, Nonthaburi, and Don Mueang Airport. Its large-scale transit system attracts high foot traffic, which may increase the risk of crimes like sexual harassment.
2. Though Bang Sue is largely residential, community familiarity doesn't guarantee safety. Social norms and power dynamics in close-knit areas can discourage victims from speaking out, reinforcing a culture of silence.
3. The scale of Bangkok's transport infrastructure, especially at large stations like Siam and Tao Poon, can lead to poorly lit areas, blind spots, and inadequate surveillance—conditions that may enable crime.
4. According to Prachatai (2019), Bang Sue had 25 out of 611 sexual harassment hotspots in Bangkok, supporting its selection as a focus area for safety studies.
5. Crowded transit spaces can create anonymity, reducing the fear of being caught and enabling offenders to act unnoticed, especially in fast-moving public areas.
6. Economic gaps may increase crime risks. Bang Sue shows the lowest land values among comparable districts, with housing priced from 140,000–255,000 baht, suggesting higher socioeconomic vulnerability.

Bang Sue District is chosen as the most suitable focus for this study based on the confluence of these six criteria: socioeconomic indicators, crime statistics, residential features, urban design hazards, transportation connection, and population density. It captures the difficulties and possibilities associated with eliminating sexual harassment in neighborhoods close to public transportation. Examining Bang Sue offers a thorough framework where social behavior, politics, and physical design may come together to create safer urban settings for all.

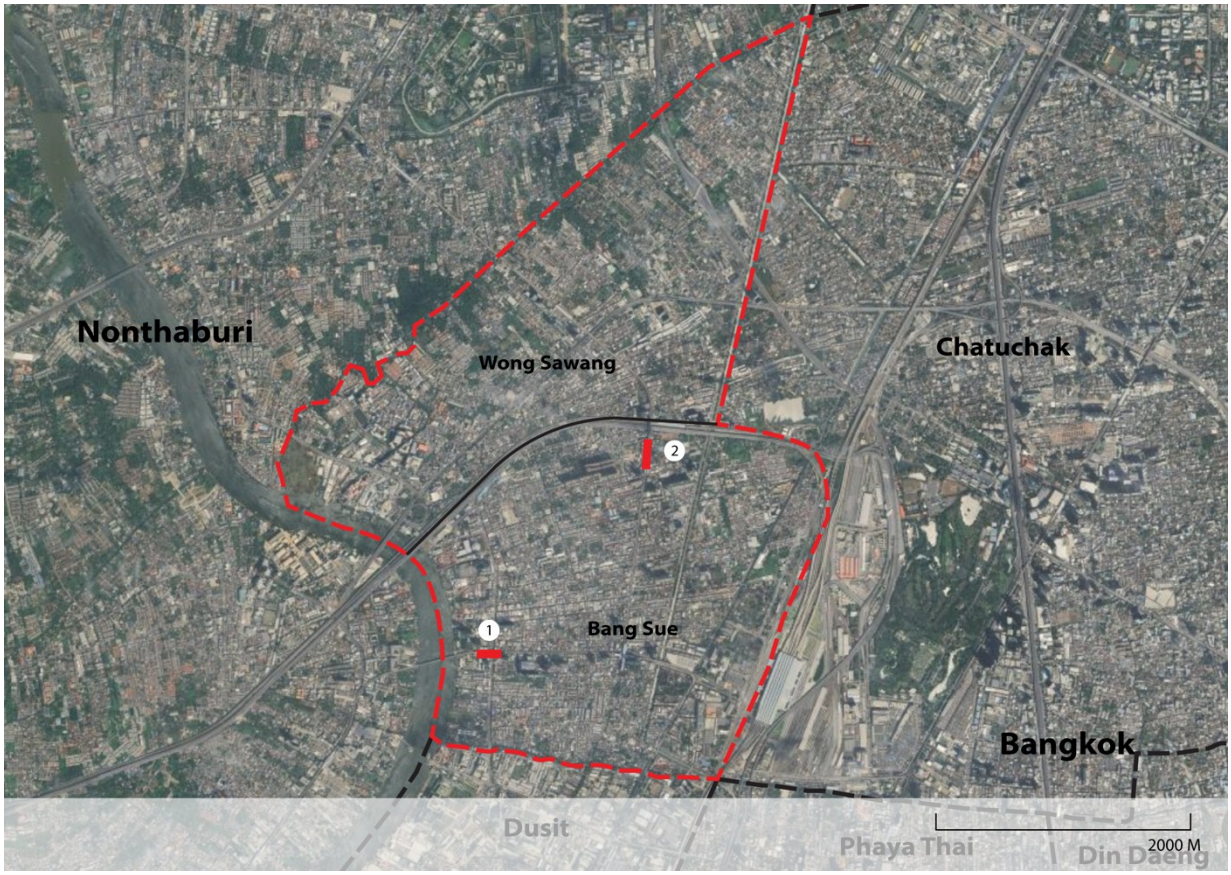


**Figure 2.** Bang Sue aerial photograph (Developed by Author).

### 3.2 Data collection tools

The elements impacting sexual safety in the vicinity of public transportation terminals were thoroughly investigated for this study using a variety of data gathering techniques, with an emphasis on comprehending the attitudes and actions of the female population. Questionnaires and observation were the two main instruments used. Both were selected due to their capacity to collect both qualitative and quantitative data.

1. Observation: By concentrating on how individuals behaved in the actual setting of public transit terminals, observation enhanced the questionnaire. This approach included time-based evaluations, walk-by observations, pedestrian counts, and direct observation. In order to determine the key times and places when sexual assaults were most likely to occur, researchers examined movement patterns and activity levels around the stations

throughout the day. The study connected environmental elements like illumination, visibility, and accessibility to the incidence of sexual harassment and other crimes by analyzing how areas were used.

2. Questionnaire: The main instrument used to collect data was a questionnaire intended to find out how safe the female population thought public transit terminals were. In order to enable responders to interact with the questions visually and provide more thorough input, it featured visuals. This method assisted in bridging the gap between theoretical ideas of safety and practical applications. Through response analysis, the study pinpointed important elements—such as inadequate illumination, a lack of monitoring, or a lack of public activity—that contribute to the feeling of reduced sexual safety in particular locations. The questionnaire's conclusions revealed situational and environmental factors that impact sexual assaults and identified regions in need of better urban planning.

**3.3 Data analysis tools**

1. Site analysis is a crucial stage in the research process, providing a detailed understanding of the study area to guide future development and planning. It helps identify both opportunities and constraints by examining the area in multiple dimensions. The analysis begins at the Macro Scale, where the broader context is reviewed, including the region’s location, general infrastructure, and surrounding connections. This initial step offers a foundational understanding of the area and its integration with the larger urban environment. The next step is the Micro Scale analysis, which zooms in on the specific characteristics of the target area, including land use patterns, existing buildings, transportation links, accessibility to amenities, and how people interact with the space. Finally, the focused analysis step targets critical problem areas within the site, such as zones with safety concerns, poor accessibility, or inappropriate land use. This in-depth analysis helps identify subtle issues that may be overlooked in broader assessments, providing insights that can lead to more focused solutions. Through comprehensive processing and linking of these data at various scales, a holistic understanding of the area emerges, which can inform targeted design and planning decisions to improve safety, accessibility, and long-term community benefits.
2. Descriptive data analysis involves summarizing and illustrating the primary data collected through the questionnaire, aiming to provide a clearer understanding of respondents' perceptions and experiences. This method helps identify patterns, trends, and relationships within the dataset. Initially, the data is prepared and visualized using tools like Excel, creating periodic tables, pie charts, and bar graphs to make the data more accessible. Descriptive analysis highlights key trends and variations, organizing the data into summary tables to separate factors of interest. These summaries allow for a more straightforward identification of correlations, which can then inform future decisions about urban design and safety measures.
3. Data synthesis involves integrating information from various sources to provide a more comprehensive understanding of the study's context, especially in areas like safety analysis. This process begins with site analysis and descriptive data from surveys, focusing on both the physical and environmental features of the area as well as the experiences of local residents. The goal is to ensure that the data gathered is reliable and suitable for detailed synthesis. Once validated, the data is combined to identify areas with higher risks and unsafe conditions. This synthesized information helps pinpoint specific locations that need more attention, supporting strategic decision-making for the development of safer urban spaces. By combining multiple data points, researchers and planners can better understand the complexities of safety issues and design solutions that address them effectively.

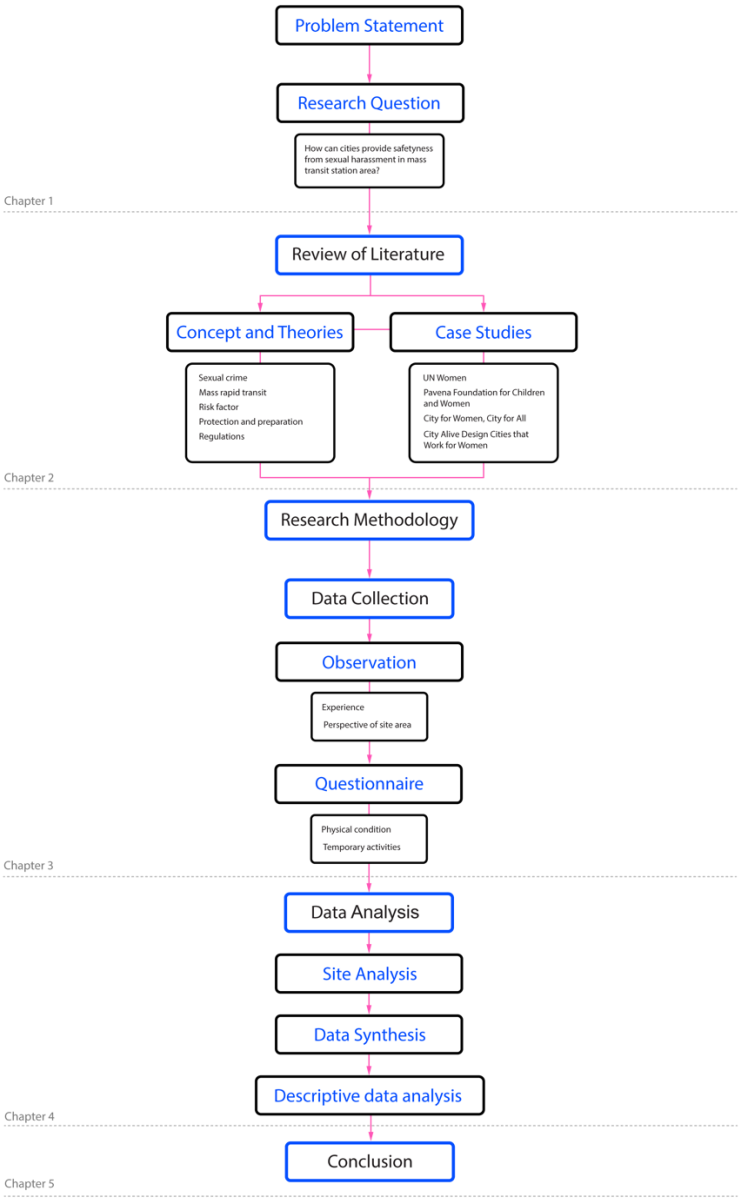


**Figure 3.** Research methodology (Developed by Author).

## 4. Results and Discussion

This study examined two primary locations within the Bang Sue district—Bang Pho and Bang Son—both of which serve as important transit-connected areas. While both sites were included in the broader analysis, this section presents findings from Bang Pho, which emerged as a more prominent case due to critical issues identified through the data.

### 4.1 Data analysis (Bang Pho study site)

Bang Pho Station, located along the Chao Phraya River, is quieter than other stations due to its proximity to the river and less foot traffic, especially during off-peak hours. The station's elevated structure and surrounding buildings block sunlight, creating a darker atmosphere around the pedestrian walkways. The MRT Blue Line connects downtown Bangkok to neighboring areas, but the large, elevated platform obscures the roads and sidewalks beneath, leaving the area under the station dimly lit.

The station's platform, 150 meters long and 22 meters wide, features a ticket office on the first floor and a railway platform above. While it is well-connected to key locations like ports and retail centers, the surrounding environment remains isolated due to the lack of light. The surrounding buildings, which are 3-4 stories tall, further block sunlight, making the area under the station feel enclosed throughout the day.

Artificial lighting is limited to the main roads, and only the entrances to the station are well-lit, leaving the rest of the area dark, especially at night. The pedestrian areas are dimly lit, contributing to a sense of isolation after hours.

The area around the station is mostly residential with some retail spaces, but many buildings are specialized shops, making the area quieter during off-peak times. Nearby public facilities like a traffic police station and a hospital, accessible via an elevator walkway, provide some security and utility, but the lack of lighting and activity leaves the area feeling less safe and vibrant compared to other transit hubs in Bangkok.

1. Natural Lighting Conditions: The pedestrian walkway beneath the northern side of Bang Pho Station is poorly lit throughout the day due to its position under the station's shadow, limiting natural light access. The station's elevated structure blocks sunlight, making the area darker compared to other parts of the city.
2. Street Lighting: There are some street lights in the area, but they do not fully cover the space, particularly in the smaller alleyways around the station. This limited coverage contributes to a darker, less secure environment, especially at night when pedestrian activity is lower.
3. Obstructed Visibility: Some areas of the station and its surroundings have obstructed visibility. Large poles and structures on the road median, as well as the police station, block views across the street. However, the pedestrian walkway itself does not have significant narrow spots or obstructions that would prevent general movement or visibility.
4. Pedestrian Traffic: The pedestrian traffic around the station is minimal, except during rush hours when commuters travel to and from work. The area is quieter because there are not many shops or services around the station, leading to less foot traffic during non-peak hours.
5. Urban Design Elements: Some parts of the pedestrian walkway are missing or in poor condition, making the space less accessible. Additionally, there are no directional signs for pedestrians, and there are no designated waiting areas for public transport. This lack of infrastructure contributes to a sense of disorganization and reduces the overall usability of the area for pedestrians.
6. Community Engagement: There is very little community engagement around Bang Pho Station. The area is mainly residential with few commercial activities. There are few shops and no significant community-driven events or activities, making the area feel isolated and underutilized.
7. Technology and Emergency Services: There are a few CCTV cameras in the area, but their coverage is limited and does not fully monitor the surrounding streets or pedestrian zones. Emergency services are available nearby, including the MRT Bang Pho station, Bang Pho Pier, and a traffic police station; however, the police station is often unmanned or abandoned, further diminishing the perceived safety of the area.

**Figure 4.** Bang Pho synthesis (10 am)(Developed by Author).

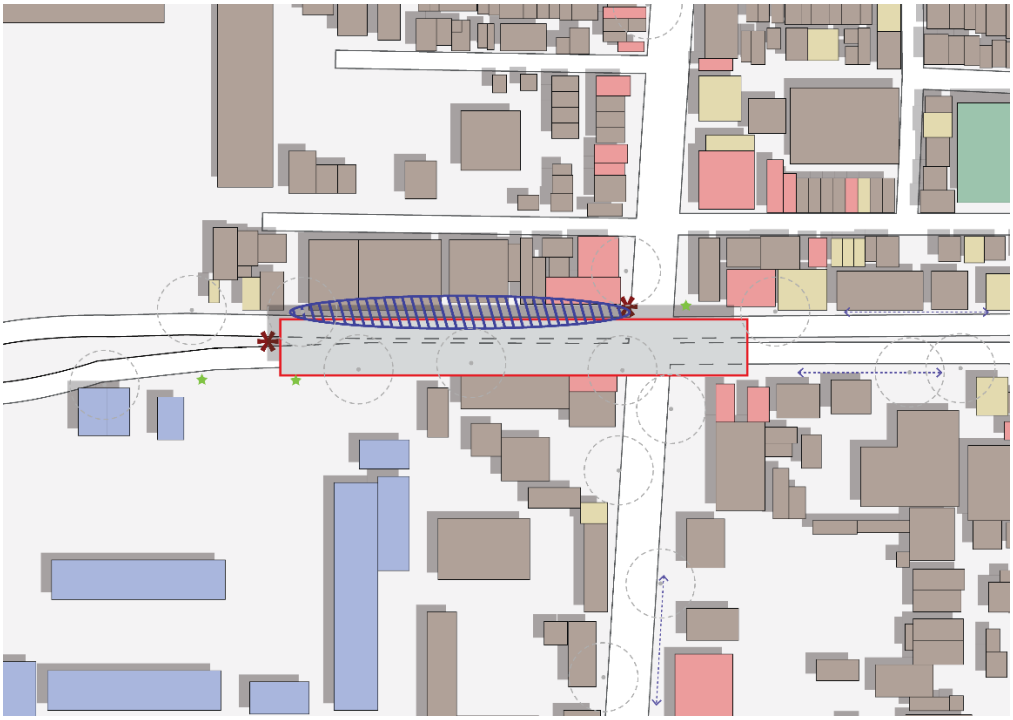

**Figure 5.** Bang Pho synthesis (2 pm)(Developed by Author).

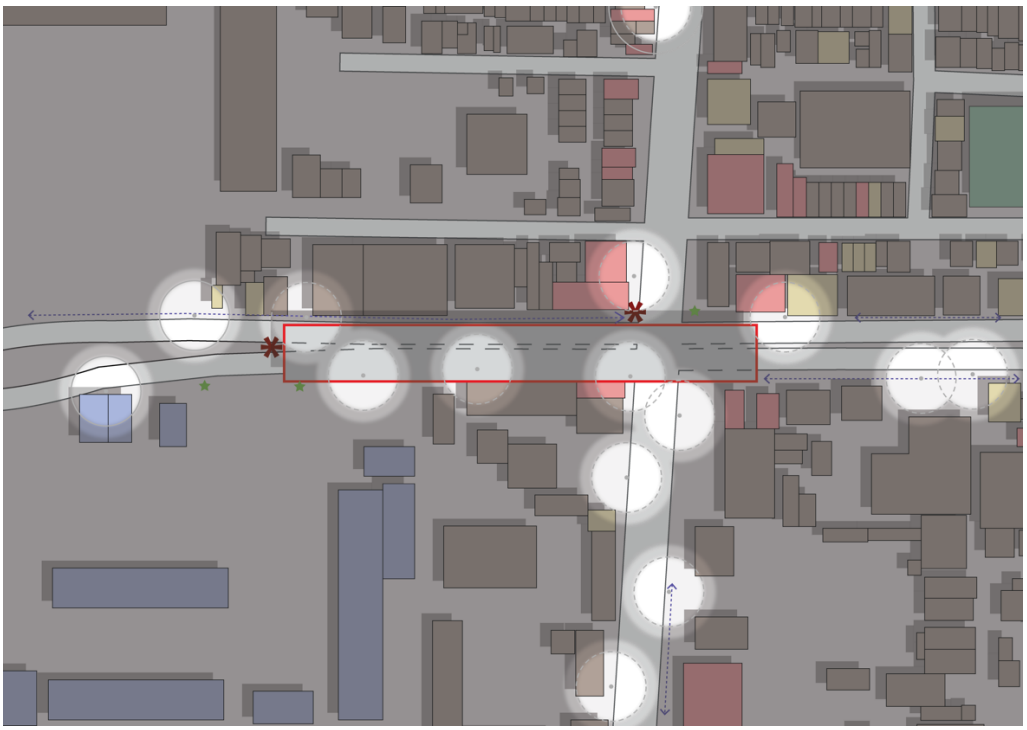

**Figure 6.** Bang Pho synthesis (10 am)(Developed by Author).

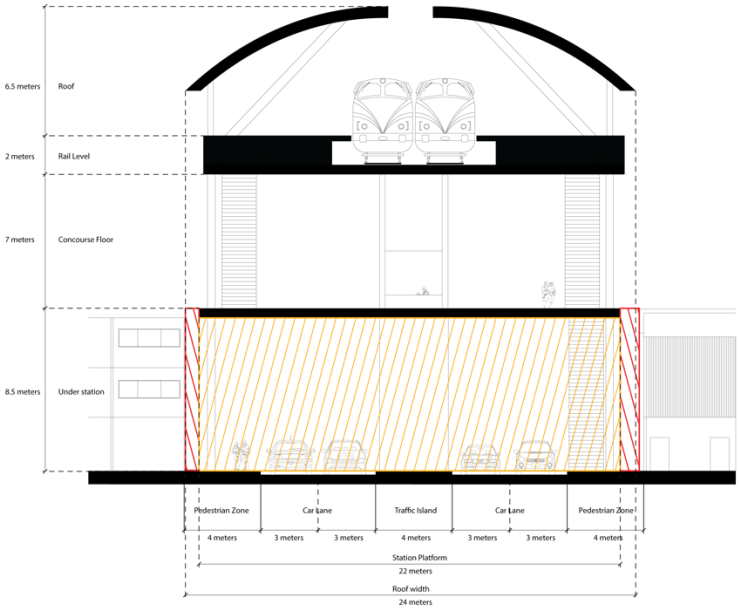


**Figure 7.** Bang Pho section (Developed by Author).

### 4.2 Questionnaire Summary

#### (1) Data Collection and Respondent Profile

The data for this study was collected through two identical sets of questionnaires, differing only in the focus station: Set 1 targeted Bang Pho station and Set 2 targeted Bang Son station. Each set consisted of four sections: (1) general information, (2) MRT usage behavior, (3) safety assessment at the station with additional safety opinions, and (4) perceptions of safety in the surrounding transit area.

Based on national data indicating that the majority of sexual crime victims are women—particularly students and working-age individuals—all survey respondents were women. Participants were categorized by age and occupation into four groups: (1) students aged 13–22 (60 people, 60%), (2) working-age adults aged 23–40 (6 people, 6%), (3) working-age adults aged 41–60 (30 people, 30%), and (4) retired individuals aged 61 and above (4 people, 4%).

Each station had 50 respondents, selected from actual users at the location. The student group, aged 13 and above, was chosen specifically to ensure a level of maturity suitable for answering sensitive questions. Due to practical limitations, individuals over 60 years old were difficult to include.

In total, 106 responses were collected. The majority of respondents were students aged 13–22 (65 respondents, 61.33%), followed by those aged 41–60 (32 respondents, 30.19%), and those aged 23–40 (9 respondents, 8.48%).

**Table 1.** Respondents categorized by age group and station.

| Age group | Bang Pho station | | Bang Son station | | Total | |
|---|---|---|---|---|---|---|
| | Number of respondent | Percentage | Number of respondent | Percentage | Number of respondent | Percentage |
| 13-22 | 33 | 31.13 | 32 | 30.19 | 65 | 61.32 |
| 23-40 | 4 | 3.77 | 5 | 4.72 | 9 | 8.49 |
| 41-60 | 17 | 16.04 | 15 | 14.15 | 32 | 30.19 |
| Total | 54 | 50.94 | 52 | 49.06 | 106 | 100.00 |

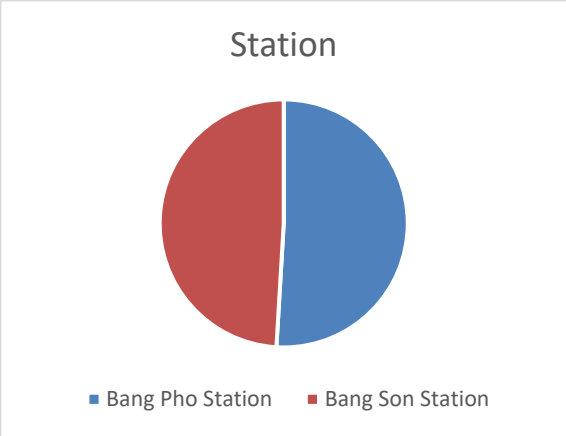


**Chart 1.** Respondents categorized by station.

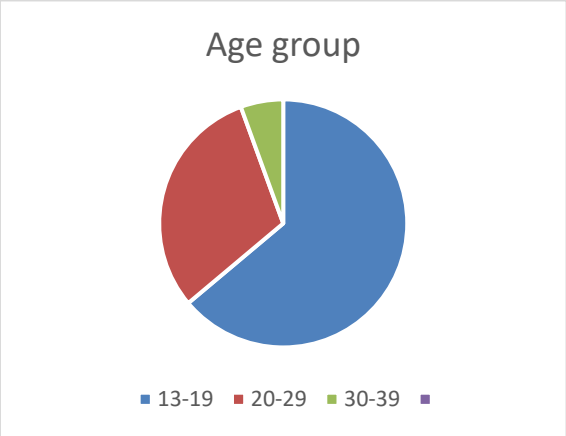


**Chart 2.** Respondents categorized by age group.

**(2) Bang Pho General Information**

A total of 54 female respondents participated in the survey focused on the connecting area of Bang Pho station. The participants were divided into four age groups: (1) teenagers aged 13–19 (23 people, 42.59%), (2) young adults aged 20–29 (11 people, 20.37%), (3) adults aged 30–39 (3 people, 5.56%), and (4) middle-aged individuals aged 40–49 (17 people, 31.48%).

In terms of occupation, students made up the largest group with 33 respondents (61.11%), primarily aged 13–29. Ten respondents (18.52%) worked in the private sector, with the majority aged 40–49. Civil servants and state enterprise workers accounted for 5.56%, all within the 40–49 age group. Traders and small business owners (7.41%) were also in the 40–49 age group. Freelancers (5.56%) were primarily aged 30–49, and one respondent (1.85%) was a housewife aged 40–49.

Most respondents (42.59%) earned between 10,000–30,000 THB per month, mainly among the younger age groups. Another 14.81% earned between 30,000–50,000 THB, while 12.96% earned between 50,000–100,000 THB. A small group (5.56%) reported incomes exceeding 100,000 THB, all aged 40–49. Those earning less than 10,000 THB made up 11.11%, primarily students.

In terms of residence, the majority (83.33%) lived in Bangkok, followed by Pathum Thani (9.26%) and Nonthaburi (7.4%). Distance from the station varied: 44.44% lived more than 5 km away, 38.89% between 1–5 km, 12.96% within 1 km, and only 3.7% within 500 meters.

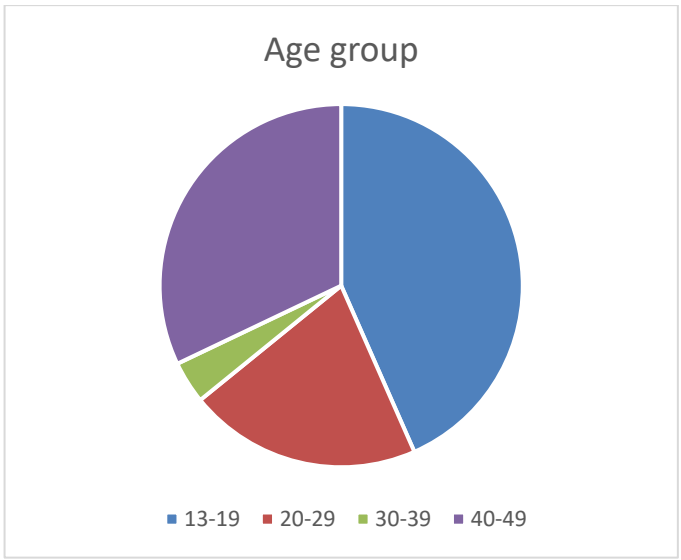


**Chart 3.** Bang Pho respondents categorized by age group.

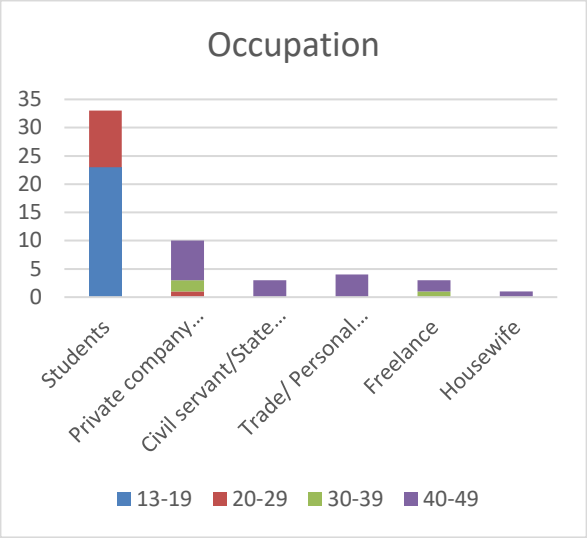


**Chart 4.** Bang Pho respondents categorized by Occupation.

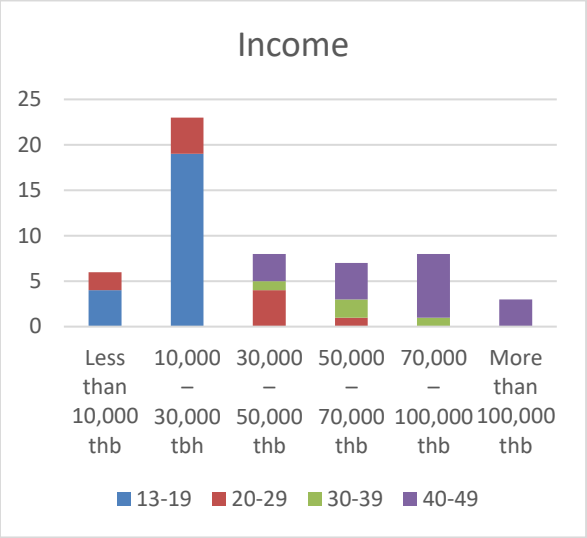


**Chart 5**. Bang Pho respondents categorized by income.

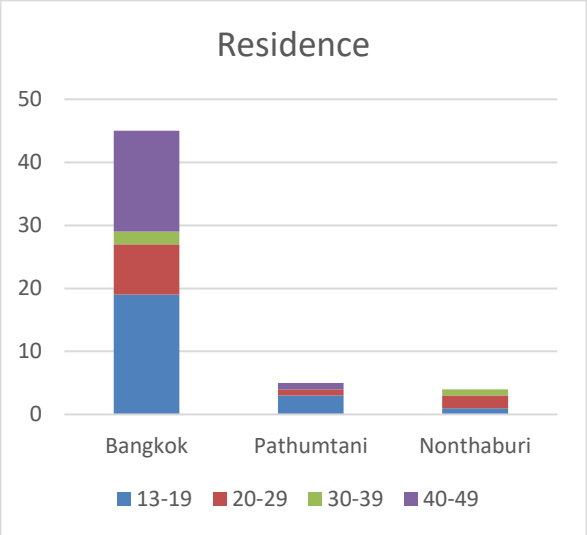


**Chart 6.** Bang Pho respondents categorized by residence

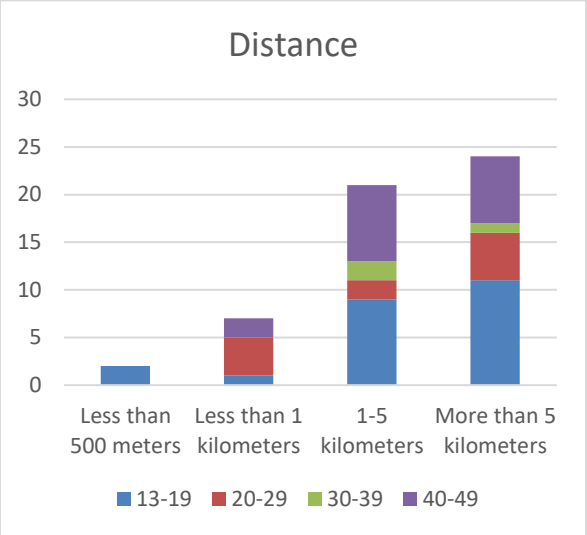


**Chart 7**. Bang Pho respondents categorized by distance from station.

**(3) User Behaviors on the MRT and in the Neighborhood**

According to the questionnaire results, transportation preferences among users at Bang Pho Station vary by age group, with motorcycle taxis being the most frequently used across all groups. However, notable differences appear in the choice of secondary and tertiary modes of transport, largely influenced by age and financial factors (Chart 8).

For respondents aged 13–19, the top three transport modes are motorcycle taxis (33.33%), private vehicles (27.54%), and taxis (24.64%). Walking and buses are the least used, at 8.70% and 5.80%, respectively.

In the 20–29 age group, the usage pattern is nearly identical, with motorcycle taxis (33.33%), private cars (27.27%), and taxis (24.24%) again being the top three. Walking (9.09%) and buses (6.06%) remain the least preferred.

The 30–39 age group showed more variation, possibly due to the smaller sample size. Motorcycle taxis still ranked highest (33.33%), followed by private cars, taxis, and walking, each at 22.22%.

For those aged 40–49, the pattern shifted significantly toward more independent travel. Private cars and taxis are tied as the most used modes (27.45% each), followed by walking (23.53%) and motorcycle taxis (17.65%). Buses were the least used in this group as well (3.92%).

Overall, motorcycle taxis dominate as a convenient and flexible option, especially for younger users, while older respondents tend to prefer private vehicles and taxis for greater comfort and independence.

Survey data reveals that most users frequented the MRT Bang Pho Station five days per week (38.89%), followed by six days (33.33%). Usage dropped significantly for three and four days (11.11% each), with only a few using it daily (3.70%) or twice a week (1.85%). The 13–19 and 20–29 age groups showed the highest usage on five to six days, while the 40–49 group primarily used the station three to five days a week (Chart 9).

Regarding travel purposes, the vast majority (75.93%) commuted for personal responsibilities—primarily for studying (61.11%) and working (14.81%). Among them, 42.59% were students aged 13–19, and 18.52% were in the 20–29 group. Work-related travel was most common among those aged 30–49. Shopping (12.96%) and other

errands—such as dining, socializing, or picking up children—accounted for 7.41%, while 3.70% in the 40–49 age group reported using the MRT for travel (Chart 10).
The three most common travel periods were:

1. 7:00–9:59 PM (27.78%),
2. 5:00–6:59 AM (25%),
3. 4:00–6:59 PM (19.44%) (Chart 11).

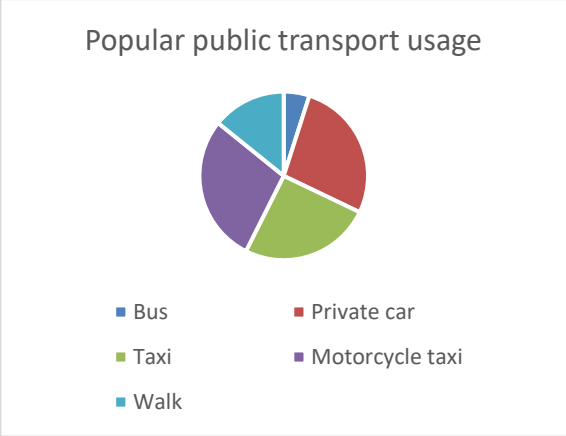


**Chart 8.** Popular public transport usage.

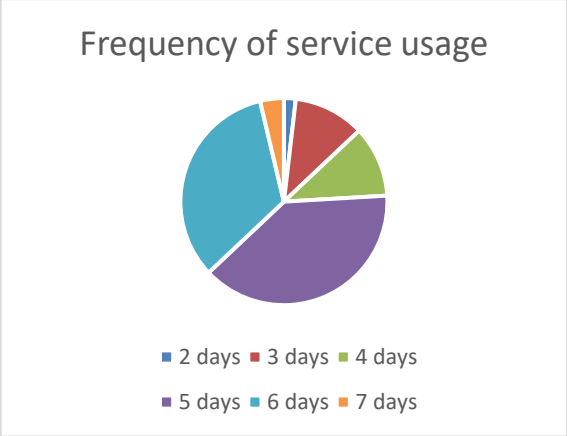


**Chart 9.** Frequency of service usage.


**Chart 10.** Purpose for traveling.

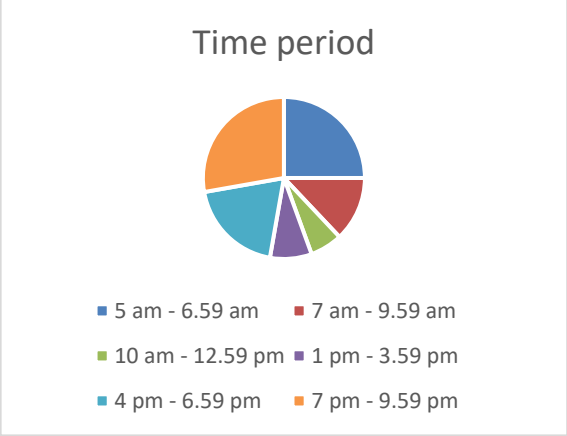


**Chart 11.** Most time period useage.

**(3) Safety assessment of Bang Pho station area from all survey points and additional opinions on safety**
Safety Assessment of Bang Pho Station Area and Users' Perspectives on Sexual Safety
The safety assessment of Bang Pho MRT Station's entrances and surrounding areas was conducted through a comprehensive survey of seven specific locations, focusing on illumination, environmental visibility, facility sufficiency, and emergency response readiness. These factors were directly tied to perceptions of sexual safety by users of all age groups.
Key Themes Identified Across Survey Points:

1. Inadequate Lighting at Night
   Across nearly all survey points (1A, 2A, 3A, 4A, 5A, 6A, 7A), respondents reported a notable decline in lighting adequacy during nighttime (8:00 p.m. – 12:00 a.m.). Areas such as 4A and 2A were particularly concerning, with over 40% rating lighting as poor or very poor.
2. Environmental Isolation and Blind Spots
   Points like 2A and 4A were perceived as more isolated and having higher incidences of blind spots. This correlates strongly with users' feelings of insecurity, particularly in areas that lack pedestrian traffic or have obstructed visibility.
3. Insufficient CCTV Coverage
   Consistently across all survey points, 35–50% of respondents rated CCTV coverage as inadequate. Locations such as 3A and 6A were seen to lack proper surveillance entirely, raising safety concerns, especially at night.
4. Perception of Emergency Response
   Despite nearby police stations or hospitals, many users felt that emergency response capabilities were lacking or insufficiently visible. Points 1A, 2A, and 4A were especially flagged for limited perceived effectiveness.
5. Psychological Comfort and Sense of Security
   Areas near official institutions like the Royal Thai Army's Quartermaster School (3A) gave users a greater sense of safety, possibly due to the visible presence of guards and open surroundings.

In contrast, 4A, being darker and more secluded under the station, created a more psychologically insecure environment for users.

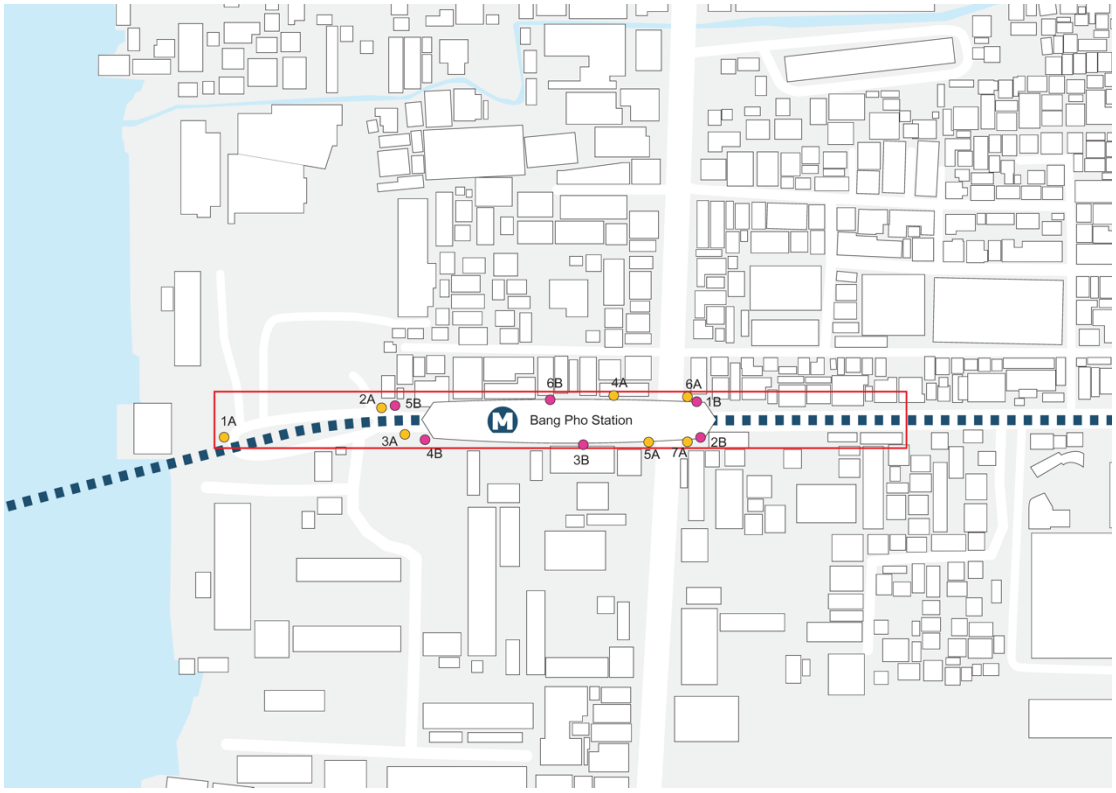


**Figure 8.** Bang Pho survey point (Developed by Author).


**Figure 9.** Bang Pho survey point perspective (Developed by Author).

Overall Findings:
The data highlights a strong correlation between physical infrastructure (lighting, visibility, surveillance) and perceived sexual safety. Even during daylight hours, some areas showed potential risks due to isolation or poor environmental design. The night hours pose the greatest concern, emphasizing a need for:

1. Improved and consistent lighting
2. Increased surveillance (CCTV installation)
3. Better visibility through open design and maintenance
4. More accessible and visible emergency contact points

**(4) The Metropolitan Rapid Transit (MRT) Bang Pho Station's structural dimensions**

In a questionnaire focusing on the construction of MRT Bang Pho station—a relatively specialized subject—59.26% of respondents indicated that the station's width contributed to a sense of danger, citing that the walkway beneath it was dimly lit, quiet, and felt unsafe. In contrast, 40.74% viewed the station's shading structure positively, noting that it reduced heat and sunlight exposure, offering comfort without affecting perceived safety. (Chart 13).
Regarding the station's height, 48.15% of participants agreed that it had an impact on safety, while the remaining 51.85% either disagreed or had no opinion on the matter. (Chart 13).
Surveys concerning a rail station's layout are inherently subjective and can be difficult to interpret, as noted in the previous section. However, all respondents (100%) to the setback-related questions agreed that the station's setbacks

were smaller than those mandated by the Thai Building Control Act. The station's close proximity to surrounding buildings, along with structural extensions that encroach on pedestrian areas, may hinder legal compliance and negatively affect the surrounding community. (Chart 14).

The questionnaire results identified the north-side walkway beneath Bang Pho Station as a high-risk area. Respondents highlighted inadequate lighting at location 4A, which remains dim throughout the day, creating dark zones and blind spots. Additionally, the presence and performance of organizations responsible for maintaining the walkway and its lighting were deemed insufficient to ensure safety. Respondents expressed similar concerns about point 6B, also identifying it as a dangerous location.

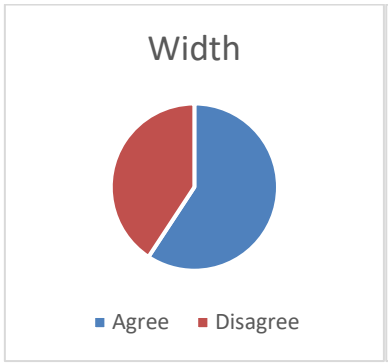


**Chart 12.** Respondents' opinion on the width of the station.

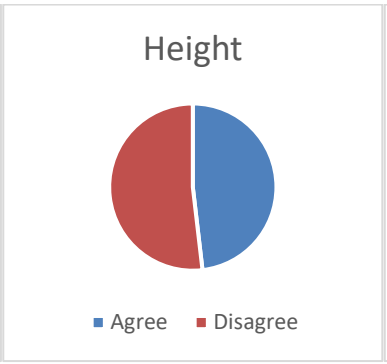


**Chart 13**. Respondents' opinion on the height of the station.

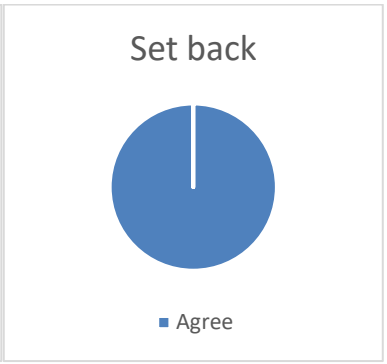


**Chart 14**. Respondents' opinion on a section of the station.

## 5. Conclusions

This study highlights the issue of gender-based insecurity in Bangkok's public transit areas, emphasizing how poorly planned urban infrastructure can increase the risk of sexual crimes and contribute to a pervasive sense of fear, particularly among women. The lack of adequate natural lighting and street illumination creates dark, unsafe spaces around transit stations, while urban structures with obstructed visibility such as high walls, dense foliage, and neglected pedestrian pathways further isolate these areas and reduce effective surveillance.

Moreover, urban design that fails to support pedestrian activity results in low foot traffic in certain areas, making them more susceptible to crime. The integration of public spaces, the quality of pedestrian infrastructure, and the mixed-use nature of urban areas also play crucial roles in shaping perceptions of safety. When transit station areas are developed without considering community needs, they risk becoming unsafe zones that do not effectively address public concerns about security.

Findings from this study indicate that crime prevention in public transportation areas must be integrated into urban planning through approaches such as Crime Prevention Through Environmental Design (CPTED) and Transit-Oriented Development (TOD). Enhancing lighting, eliminating blind spots, promoting pedestrian-friendly environments, and incorporating safety technology for example, CCTV surveillance and emergency assistance points are essential measures to reduce crime risks and improve public confidence in transit areas.

Therefore, future transit infrastructure development in Bangkok should prioritize gender-inclusive urban planning that fosters safety for all users. Encouraging community participation in the planning process, integrating advanced security technologies, and designing public spaces that meet the needs of diverse populations will be key strategies in creating a safer, more equitable, and inclusive urban transit environment for the city's future.