

“GTALK Report Series: Safer Cities in Asia”  
*Pathum Thani, Thailand*



December, 2021

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# **GTALK Report Series: Safer Cities in Asia**

**Gender and Transport Assemblage of  
Learning and Knowledge**



The **Women in Transport Leadership Knowledge Network (WITL)** is an international community of transport scholars with the ambition of encouraging more women and girls to take up careers in transport and foster women's leadership in the transport sector. In partnership with transportation domestic societies in Asia, and the regional transport peak body Eastern Asia Society for Transport Studies (EASTS), we collectively aim: 1) to increase the profile and global presence of women leaders in transport; 2) to strengthen women's voice to be able to advocate their distinct transportation needs; 3) to acknowledge and celebrate female leadership; and 4) to employ research to gather evidence base to better address the gendered dimension of transport planning and design, strategically supporting the United Nations' Sustainable Development Goal (SDG) 11 (make cities inclusive and safe, resilient and sustainable) and SDG5 (empower women and girls). [www.witl.info](http://www.witl.info)

The **Gender and Transport Assemblage of Learning and Knowledge or GTALK** is a unifying framework an online, open-access knowledge database on gender and transport (e.g. information, research publications, webinar presentation materials, interviews of women transport leaders, including case study initiatives on pandemic response in transport settings across the several cities), to be shared nationally and internationally. These materials are developed to raise awareness and support the embedding of planning and policies that will help advance the shared regional opportunity of shaping more gender-inclusive and responsive transportation sector in Australia and Asia-Pacific.

# Contents

Summary.....	7
Introduction.....	8

## 2

### *Empirical Study Findings*

14

#### *2.1 Victimization*

14

- 2.1.1 Most prominent type of sexual harassment
- 2.1.2 Most common problems experiences by students while travelling
- 2.1.3 Temporal characteristics
- 2.1.4 Reporting crime

#### *2.2 Perception of Safety*

19

- 2.2.1 Before COVID19
- 2.2.2 Safety variations
- 2.2.3 Perceptions of safety

#### *2.3 Challenges and Recommendations*

24

- 2.3.1 Common challenges
- 2.3.2 Safety variations
- 2.3.2 Suggestions to improve safety

## 3

### *Conclusion and Recommendations*

27

References.....	29
Appendix.....	31



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(<https://unsplash.com/photos/-y3sidWvDxg>)

## *Summary*

This report presents the results and findings of the survey implemented in Patum Thani, Thailand in 2021. The report is drawn from a combination of literature review and online survey responses of tertiary students attending a university in Patum Thani, Thailand. This documents their perception of public transport safety. The study was undertaken from November 2020 to January 2021. This report on Patum Thani was an output of the GTALK Research conducted by the Women in Transport Leadership Knowledge Network.

## Introduction

This report conveys the study results conducted on student victimization and perceptions of transport safety in Thailand. The focus on a university campus was deliberate so that the investigation is able to capture the perception and experience of student commuters. Students, in general, are considered as captive transport users.

An online travel survey was deployed to university students in Thammasat University, Rangsit Center, Pathum Thani. The survey collected socioeconomic characteristics, demographic characteristics, and travel behaviour. The online questionnaire survey form was developed using Google form and distributed through social media in December 2020.

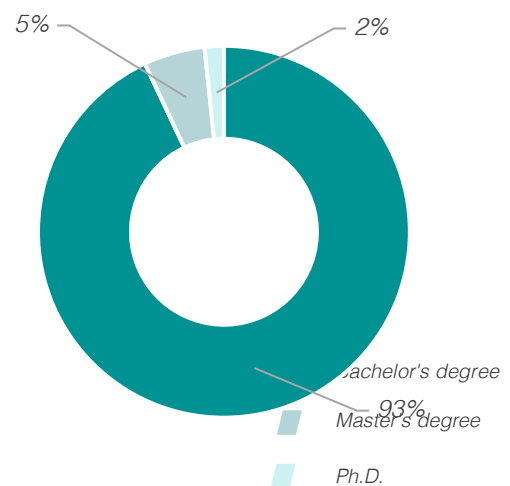
The study objectives were two-pronged: 1) investigating the impact of public transport travel due to the coronavirus outbreak of 2019 and 2) victimization and transport safety of students.

A total of 329 respondents were collected. Collected data were analyzed using descriptive analysis. Inferential statistical analyses were comparatively executed for assessing the distributions of the variables by applying logistic regression.

Thammasat University is a university in Thailand with 4 campuses in *Tha Phra Chan campus* at Phra Nakhon District, Bangkok; *Rangsit campus*, Pathum Thani province; *Pattaya campus*, Chonburi province; and *Lampang campus*, Lampang province.

Thammasat University, *Rangsit Campus* is located in Khlong Luang District, Pathum Thani Province. It is about 42 kilometers north of the capital of Bangkok, Thailand. It is connected to the main campus, Tha Phra Chan, by shuttle bus.

Thammasat University has over 39,000 students. The number of bachelor's degree was over 86 percent (Fig.1), while there was 11 percent master's degree. Over 75 percent of students was in *Rangsit campus* and there was 93 percent bachelor's degree (Thammasat University, 2021).



**Figure 1. University officials population size in Thammasat University, Rangsit campus**

The Rangsit campus of Thammasat University mainly focuses on engineering and technological research and education. International engineering, health sciences, and journalism programs are also taught at Rangsit Centre. The Thailand Science Park (National Research Centre) and the Asian Institute of Technology are located nearby.

**Detailed data is found in the Appendix.**



Pathum Thani Province is one of the suburban provinces north of the Bangkok Metropolitan Area (BMA) (Fig. 2). It has received the spillover growth from and expansion of Bangkok, Thailand’s capital city, and this have resulted in an urban sprawl characterized by clusters of peri-urbanization interspersed along significant transportation corridors.

Pathum Thani Province has a predominantly residential building use (83%) and the left are mixed with industrial (3%), agriculture (0.4%), and commercial land use activities (9%) (Pathum Thani Office of Public Works and Town & Country Planning, 2017).

It has been a prime location for suburban housing expansion since the 1970s. Thailand’s International Airport, which is located in Don Muang, is within a few kilometers from the Pathum Thani border. The expansion of housing, industries, educational institutions created more demand for public utilities such as roads, electricity, water supply, telephones, and traffic mitigation solutions.

While this expansion has created opportunities that enhanced the quality of life for the urban population, including employment, education, economic and social development, as well as access to better quality basic amenities, this growth and development have led to environmental deterioration such as air/water pollution and reduction in water quality (Nicolaisen et al., 1991).

Pathum Thani Province has been shown by the location of many large industrial estates, centers for education and research, housing estates, a national distribution center for agricultural goods, regional hospital, shopping mall, and new road networks (Iamtrakul and Chayphong, 2021)

The province has a variety of activities and social diversity that can demonstrate the dynamic interaction between the factors that affect the city's development.

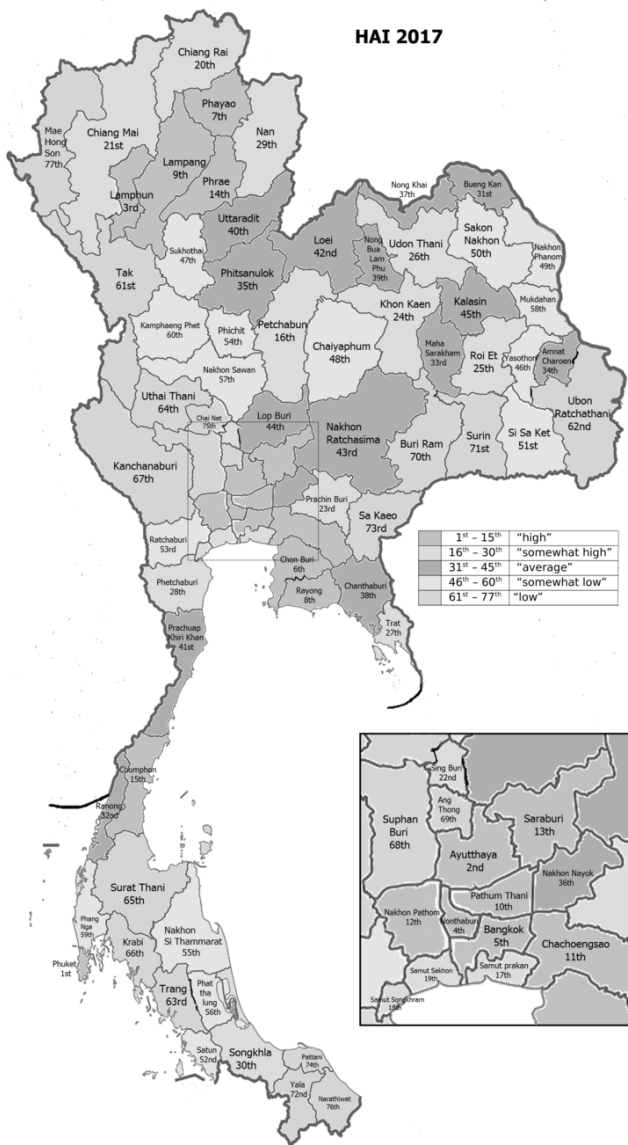
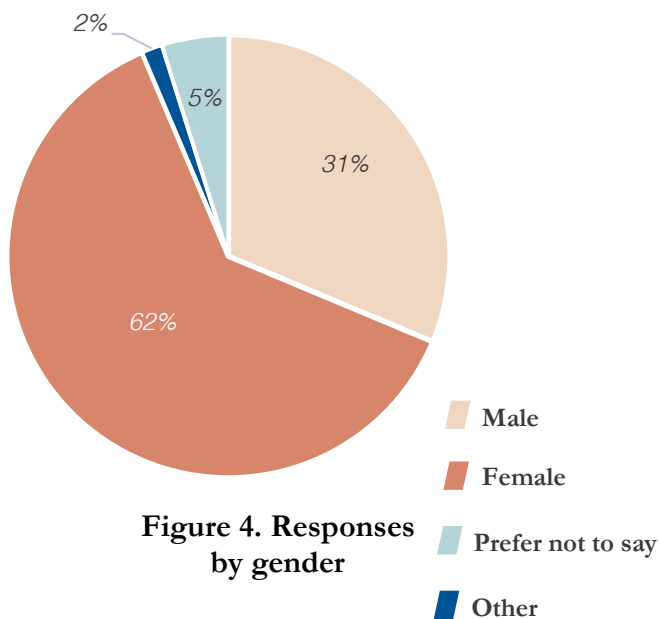


Figure 2. Map of Thailand, with the location of Pathum Thani and Bangkok. Source: Wikimedia



The survey collected information in three main areas: 1) Socio-demographic attributes: residential location, age, gender, race, as well as the economic factors; 2) Trip characteristics: typical trip pattern before and after COVID-19; and 3) COVID-19 impact: an extensive set of questions about students' attitudes and perceptions.



**Figure 4. Responses by gender**

The collection of 329 questionnaires represented a sample of college students who were studying at the university; 62.3 percent were female, followed by 31.3 percent by males (Fig. 4).

In terms of age, it was found that the majority of the sample were 18-24 years old, accounting for 83.3 percent because the sample was composed of students currently studying at the university.

In terms of occupation, it was found that most of the sample group were unemployed (accounted for 29.8 percent) because they are studying at the university, followed by a full-time job accounted for 10.6 percent and a part-time job representing 7.9 percent, respectively.

When considering the household monthly income (baht) level, it was found that most of the sample group earned 64,000 - 120,000 baht (PHP 100-200k) accounted for 28.0 percent, followed by 12,000 - 32,000 baht (PHP 20-50k) is 21.0 percent and less than 12,000 baht (<PHP 20k) or 19.8 percent. In terms of length of stay, it was found that most lived in Pathum Thani province for more than five years or more, while 12 percent were visiting the city.

**1) Driver's license**

More than 55.3 percent of the samples had a driving license in possession.

**2) Car ownership**

More than 80.5 percent of the sample group owned private vehicles, followed by motorcycles (accounting for 66.3 percent) and bicycles (53.5 percent).

**3) Trip purpose**

Most respondents reported that they start their journey from their home, either a dormitory or student residence, to travel to various locations, depending on the trip purpose. The study found that the most common trip purpose was travel to university or study (36.3 percent). It is followed by housing (accounted for 25.6 percent). Next, shopping is approximately 16.2 percent, and for recreation, it is 15.9 percent.

**4) Mode of travel**

Survey respondents indicate that their preferred transport mode depends on their trip's length (travel distance). When the travel distance from their residence to the university is less than 5 kilometers, student respondents report that they prefer to walk (31.6 percent), take a motorcycle taxi (20.7 percent), use a private motorcycle (12.5 percent), or private car (11.9 percent). For longer distance travel (when the distance from the residence to the university is more than 5 kilometers), the preferred mode of transport for students is by private car (32.5 percent). That is followed by public transport (28.0 percent) and rail transport (18.8 percent).

**5) Before and during COVID travel**

When asked about any travel behavior change, 69 percent of respondents reported that their use of public transport went down during the coronavirus outbreak. Public transport is the primary choice of travel, especially in the female group and most of the age range is 18-24 years (see Fig. 5).

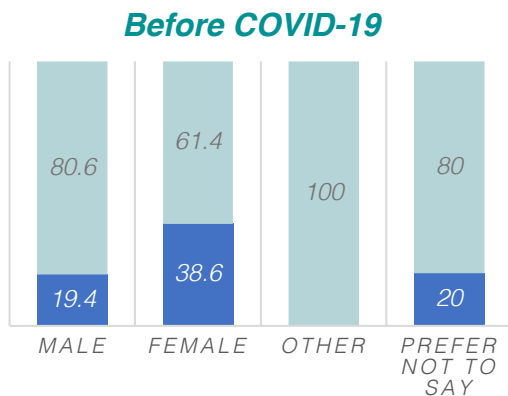
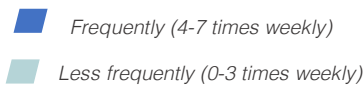


Fig 5.1a: Gender, before COVID

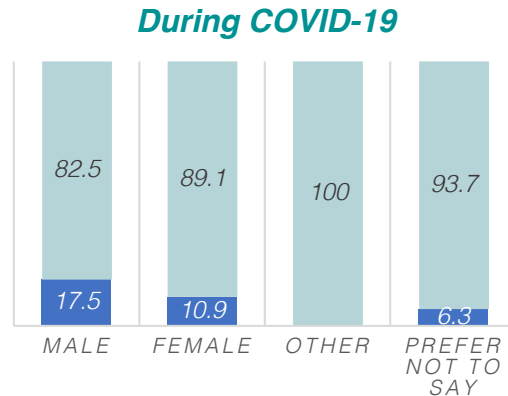


Fig 5.1b: Gender, during COVID

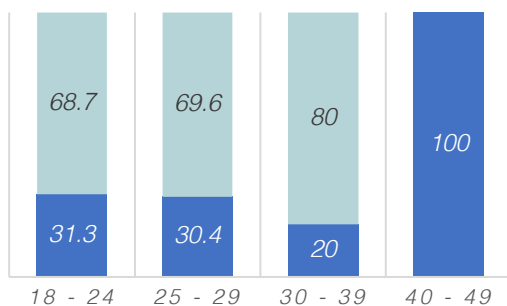


Fig 5.2a: Age, pre-COVID

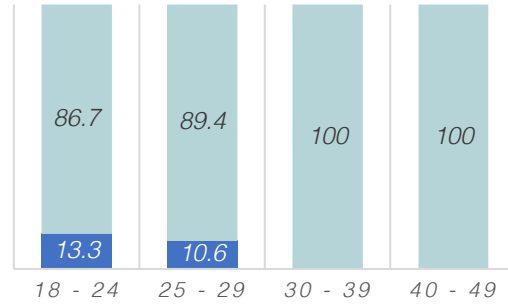


Fig 5.2b: Age, during COVID

**Figure 5: Before and during COVID-19 pandemic**

## 2

## Findings

## 2.1 Victimization and Harassment

Transit crime and harassment can occur in many forms. According to Ceccato and Loukaitou-Sideris (2020), sexual violence in public transport can either be *Verbal* (comments, whistling, making kissing sounds, asking you personal questions about sexual life, sexual comments about clothing, looks, asked to have sex, using obscene/abusive language, calling you babe, honey, sweetheart), *Physical* (touching inappropriately, groping, pulling or playing with your hair, stalking or stranger following you), or *Non-verbal* (staring, leering, gesticulating, unwanted sexual looks or gestures, indecent exposure, showing pornographic images, masturbating in public).

Moreover, the experience of sexual harassment violence varies temporally and spatially. For instance, the experience of harassment can differ depending on if one is walking to the public transport stop, waiting at the stop/terminal riding the train or bus (Natajaran 2017). Such experience can also differ depending on traveling during the day or at night.

## 2.1.1 Type of sexual harassment

When respondents were asked if they (or someone they know) have experienced sexual harassment while in public transit, 45 percent agreed while 55 percent indicated 'No'.

**A slightly lower proportion of students reported that they have experienced verbal, physical or non-verbal harassment.**

Figure 6 shows a histogram of the frequency of harassment reported by student respondents.

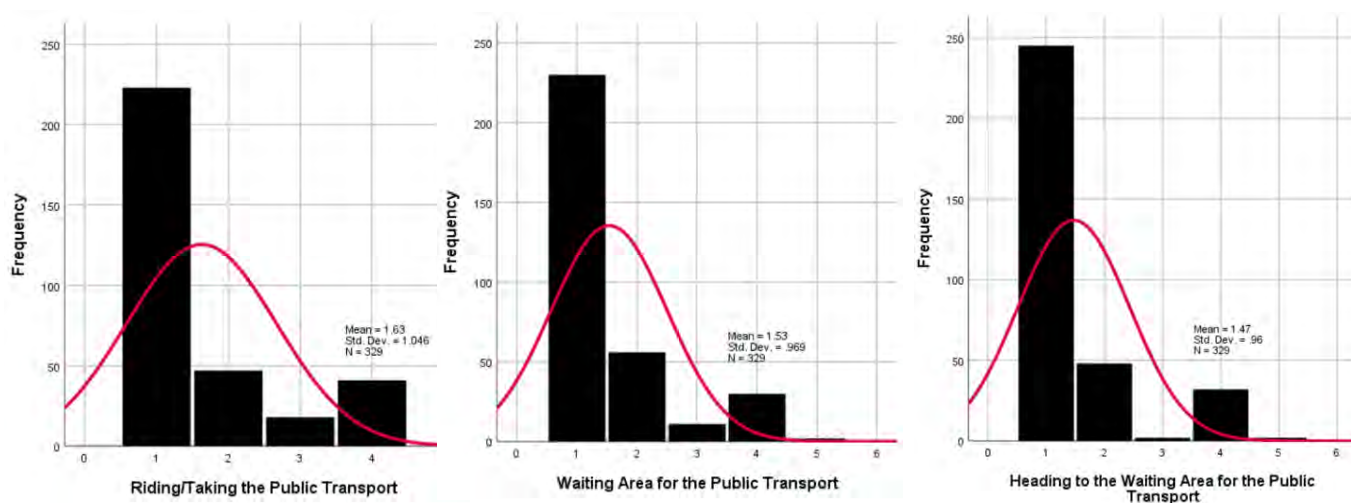
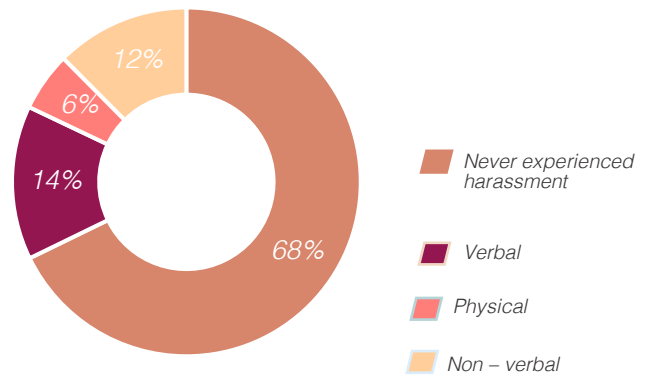


Figure 6. Histograms of the experienced harassment

**In the last 3 years, have you experienced any of the following while Riding/Taking the Public Transport?**

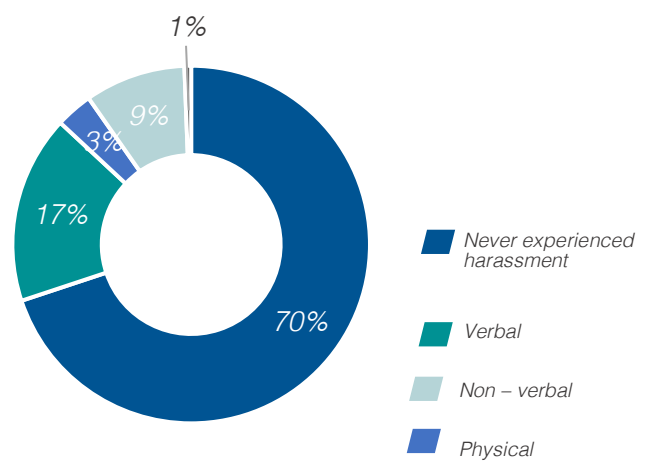
When student respondents were asked if they have personally experienced sexual harassment or violence in the last three years while riding or taking public transport, three in 10 have answered affirmatively. Fourteen percent (14%) experienced verbal harassment, 12 percent experienced non-verbal harassment and 6 percent experienced physical harassment (see Fig. 7).



**Figure 7. Proportion of experienced harassment while riding/taking the public transport**

**In the last 3 years, have you experienced any of the following while at the Waiting area for the Public Transport?**

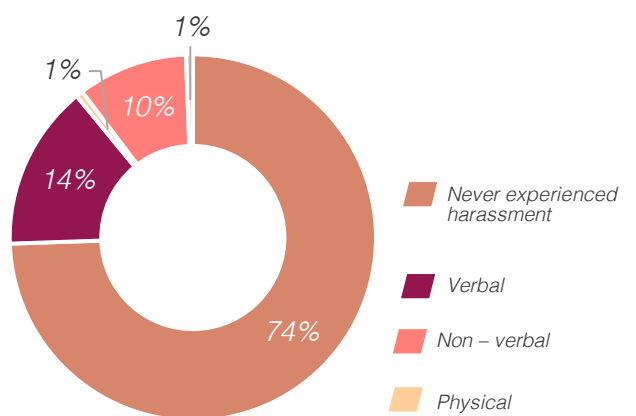
When student respondents were asked if they have personally experienced sexual harassment or violence in the last three years while commuting on public transport, most reported not having experienced harassment. However, 3 in 10 reported being harassed verbally, physically, or in other non-verbal ways. About 17 percent reported that they were verbally harassed, 9 percent were non-verbally harassed, while 3 percent reported being physically harassed (see Fig. 8).



**Figure 8. Proportion of experienced harassment while waiting area for the public transport**

**In the last 3 years, have you experienced any of the following while Heading to the Waiting area for the Public Transport?**

When student respondents were asked if they have personally experienced sexual harassment or violence in the last three years while heading to, walking to, or accessing the public transport, 74 percent reported that they had not experienced harassment. However, one in four indicated that they experienced harassment while waiting at the bus stop or train terminal. About 14 percent reported having been verbally harassed, while 1 in 10 indicated that they experienced non-verbal harassment (see Fig.9).



**Figure 9. Proportion of experienced harassment while heading to the waiting area for the public transport**

2.1.2 Sexual harassment by gender

They are investigating the most common issue experienced by students while traveling on public transit and how this experience differs by gender. Most female and male respondents reported that they have not experienced verbal, physical, or non-verbal harassment while walking to a public transport stop, station, or terminal while taking/traveling by/riding a public transport; or waiting at the bus stop for public transport.

For those who have reported experiencing harassment, male and female experience were significantly different. **Female respondents are two to three times more likely to experience being harassed** (see Fig 10).

Moreover, each gender subgroup (e.g., male, female and other) would also report having encountered different experiences across the three transit environments (e.g., walking, waiting and riding).

These reported differences must be considered and accounted for in the design, planning and management of transportation systems if the intent is to improve service provision and safety.

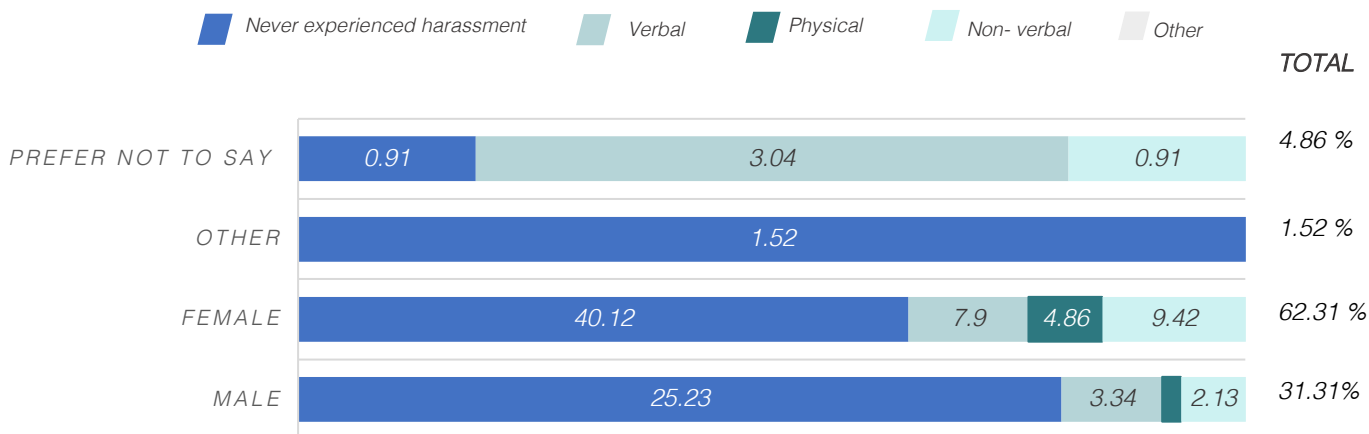


Fig. 10.1: Results of experienced any of the following while riding/ taking the public transport by gender

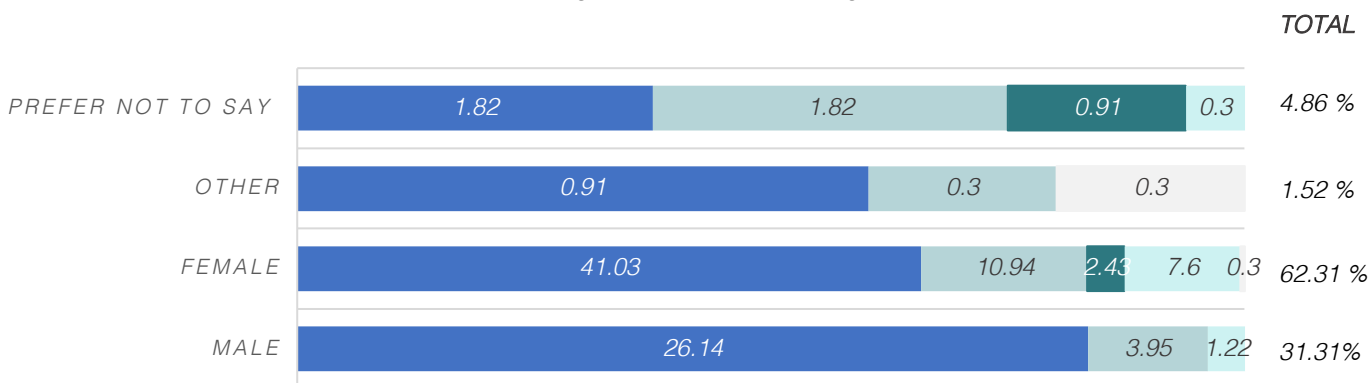


Fig. 10.2: Results of experienced any of the following while at the waiting area for Public Transport by gender

**Figure 10: Proportion experienced harassment while riding/taking, waiting, and heading to public transport by gender**

### 2.1.3 Sexual harassment by time of day

The provision of public transport service during the evening is vital to support the mobility of the urban population, particularly night shift workers who largely depend on public transportation. It is an essential component to ensure a seamless, integrated transport network, which allows everyone to explore the city safely and conveniently enjoy the vibrant nightlife. However, there is an overall perception that incidents of crime and harassment increase during nighttime. This section explores students' responses under the difference of their feeling in safety during the day versus after dark.

When asked about the difference in their experience of harassment during the day and night time, 48.9 percent of student respondents felt safe while walking to the public transport stop, and 52.6 percent felt safe while waiting for public transport during the day.

**About 82 percent of the student respondents felt more unsafe to use public transport at night, and more than 79 percent reported feeling unsafe walking to a stop.**

About 6.4 percent reported choosing not to use public transportation at all during evenings/at night. with more details as in Fig. 11.

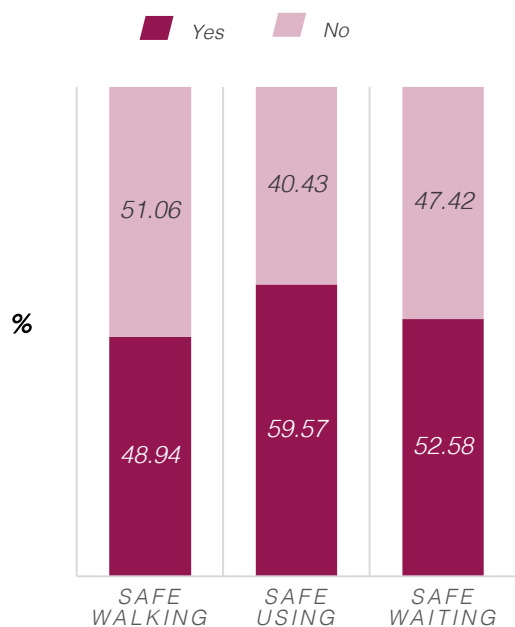


Fig. 11.1: During the daytime

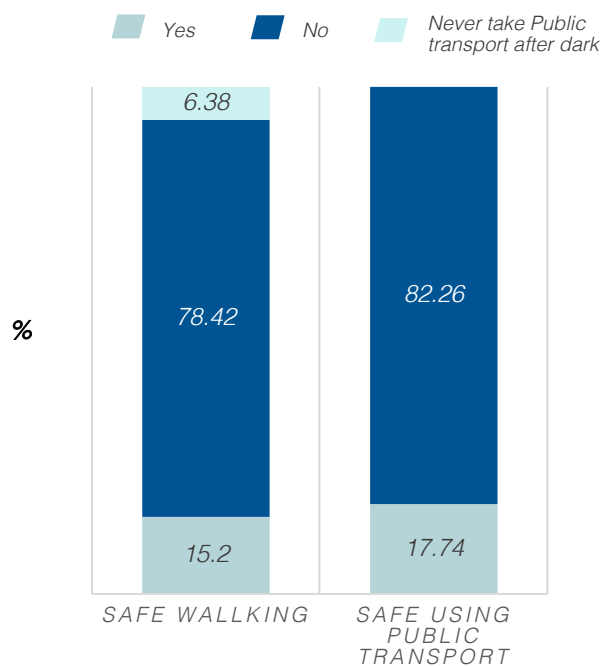


Fig. 11.2: After dark

**Figure 11: Results of safety during daytime and after dark while using public transport**



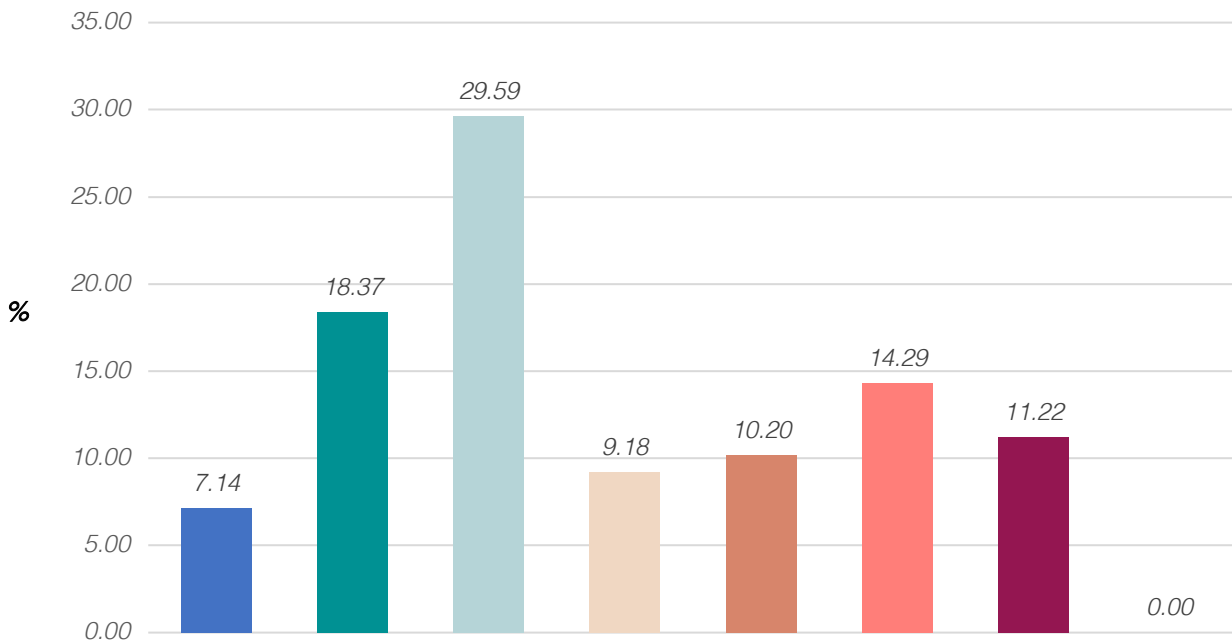
### 2.1.4 Reporting of crime

Research shows that reporting sexual harassment incidents has always been low because victims and those who witnessed an offense feel that the police and the justice system do not take them seriously.

*When posed with the question of reporting harassment incidents, do victimized students and bystanders report crime?*

**An overwhelming proportion of student respondents (67%) who indicated that they experienced harassment did not report the incident to anyone. Only 16 percent did.**

Only 7 percent reported to the police. About 30 percent indicated that they sought help from those around them while 18 percent confronted their harasser. In addition, about 14 percent avoided specific stations or public transport stops. Responses are provided in Fig. 12



**Figure 12: React/Took action/Take precautionary measures**

- Called/ asked help from police
- Confronted the harasser
- Asked others for help/ got support From people around
- Carrying some kind of a weapon
- Dress a certain way/ do not wear jewelry/ avoid carrying purse or wallet
- Avoid specific public transport stations/ stops
- If other people are around or at daytime
- Other

## 2.2 Perception of Safety

### 2.2.1 Perception of safety, Daytime & After dark

Student respondents were asked about their perception of safety when using public transport during the day and after dark. About 60 percent of students responded that they generally feel safe. When the data is disaggregated by gender, the feeling of safety while traveling during the day remained the same, with 59 percent of men and women reporting feeling safe while 41 percent reporting that they did not feel safe.

When asked about their perception of safety while commuting after dark, their perception of safety changed significantly. The feeling of safety dropped significantly. Only 29 percent of male respondents and 11 percent of female respondents reported still feeling safe when traveling after dark.

**7 out of 10 male commuters and 9 out of 10 female commuters felt insecure and unsafe when traveling after dark.**

This is consistent with past studies on public transport commuters’ perception of safety during after-dark travel.

Concerning commuters’ perception of safety when walking at night, About 69 percent of male respondents felt unsafe while 84 percent of female respondents felt unsafe while walking to public transport stops or terminals at night (details provided in Fig. 13).

**Twenty-one out of 329 respondents answered that they never take public transport at night.**

The perception of safety, which significantly worsens during evening travel, is a critical issue to consider and address, mainly if the aim is to encourage uptake of public transport. Access to safe and secure mobility options is a fundamental right for everyone.

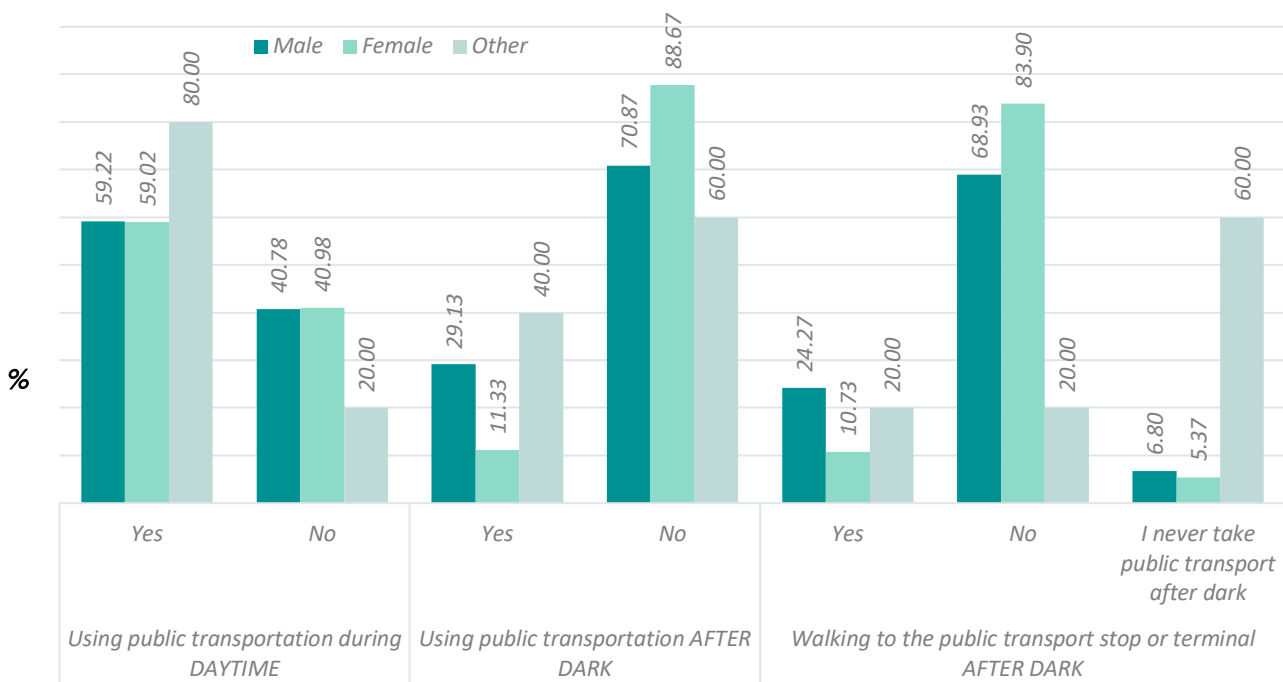


Figure 13: Perception of safety during daytime and after dark while using public transport

### 2.2.2 Perceptions of safety, Walking and Waiting environments

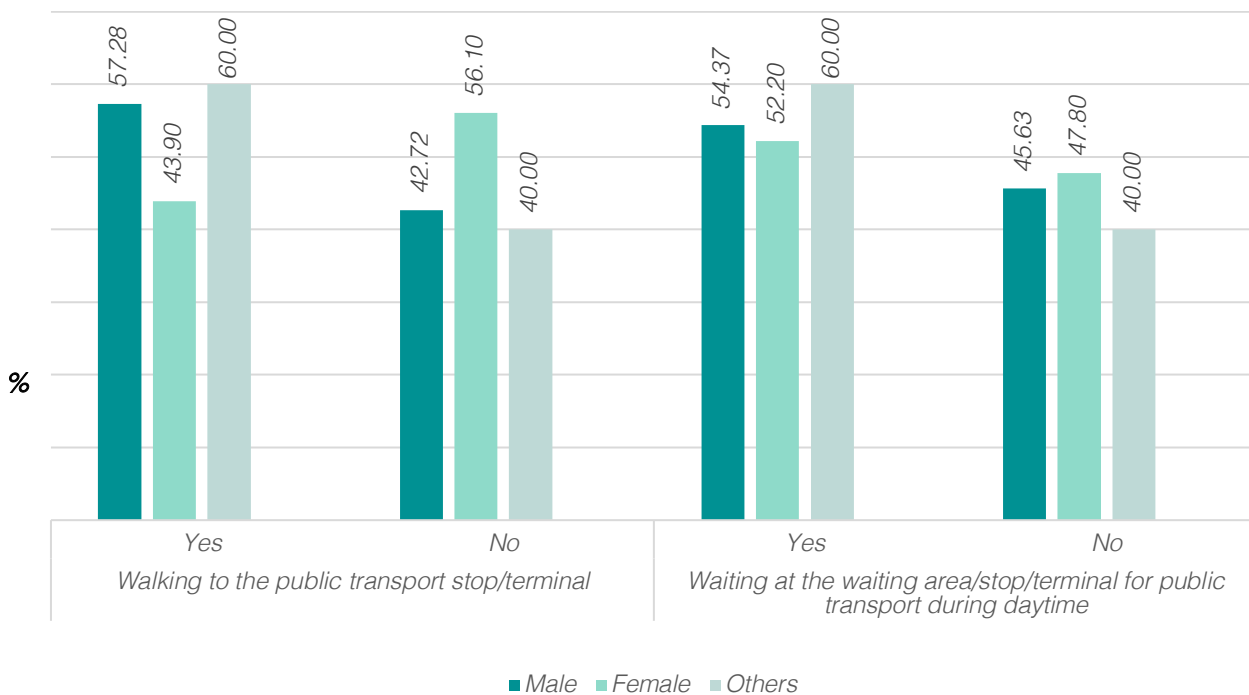
The survey inquired about students' perception of safety while waiting at the bus stop/train platform/station compared to their perception of safety while walking to the public transport stop. Student responses varied.

A higher proportion of male respondents (57%) reported feeling safer than their female counterparts (44%) who reported feeling safe while walking to the public transport stop.

Similarly, 54 percent of male student respondents reported being safer than their female counterparts (52%) while waiting for public transport at stops/terminals/stations.

**Interestingly, in both the Walking and Waiting environments, slightly more female respondents reported feeling unsafe while more male respondents reported feeling safe.**

The results further reinforce Natarajan et al.'s (2017) call for a more comprehensive understanding of sexual victimization across the different components of the transit environment --- walking, waiting and riding – arguing that crime concentrations differ at each stage of the whole transport journey.



**Figure 14: Safety during daytime while traveling to stop/terminal for public transport**

### 2.2.3 Perceptions of safety, Social and physical environments

When posed with the question of how the social and physical environment of transit settings affect perceptions of safety, 14.2 percent of student respondents expressed that the most commonly perceived challenge encountered when using transit was poor service. That, in particular, referred to the lack of travel information, information on travel and waiting time, capacity, the lack of standardized services, and no information on the capacity limits or the number of passengers that can be accommodated at each stop were some of the challenges that they encountered within transit environments.

This is followed by multiple transfers causing inconvenience (13.8%), inadequate infrastructure (13.4%), poor facilities (12.9%) and an unsafe environment during the evening (12.8%). More specifically, the lack of basic amenities such as cleanliness, lighting, a ventilation system does not promote a quality travel environment.

One in Ten student respondents indicated that inadequate infrastructure, personal safety, and health risks are significant issues they face when using public transport.

These factors, identified by student respondents, are all important to consider when traveling by public transport. Therefore, it would need to be improved and addressed, especially in emerging economies where good infrastructure development is critical in driving sustainable and inclusive growth (see Fig. 15).

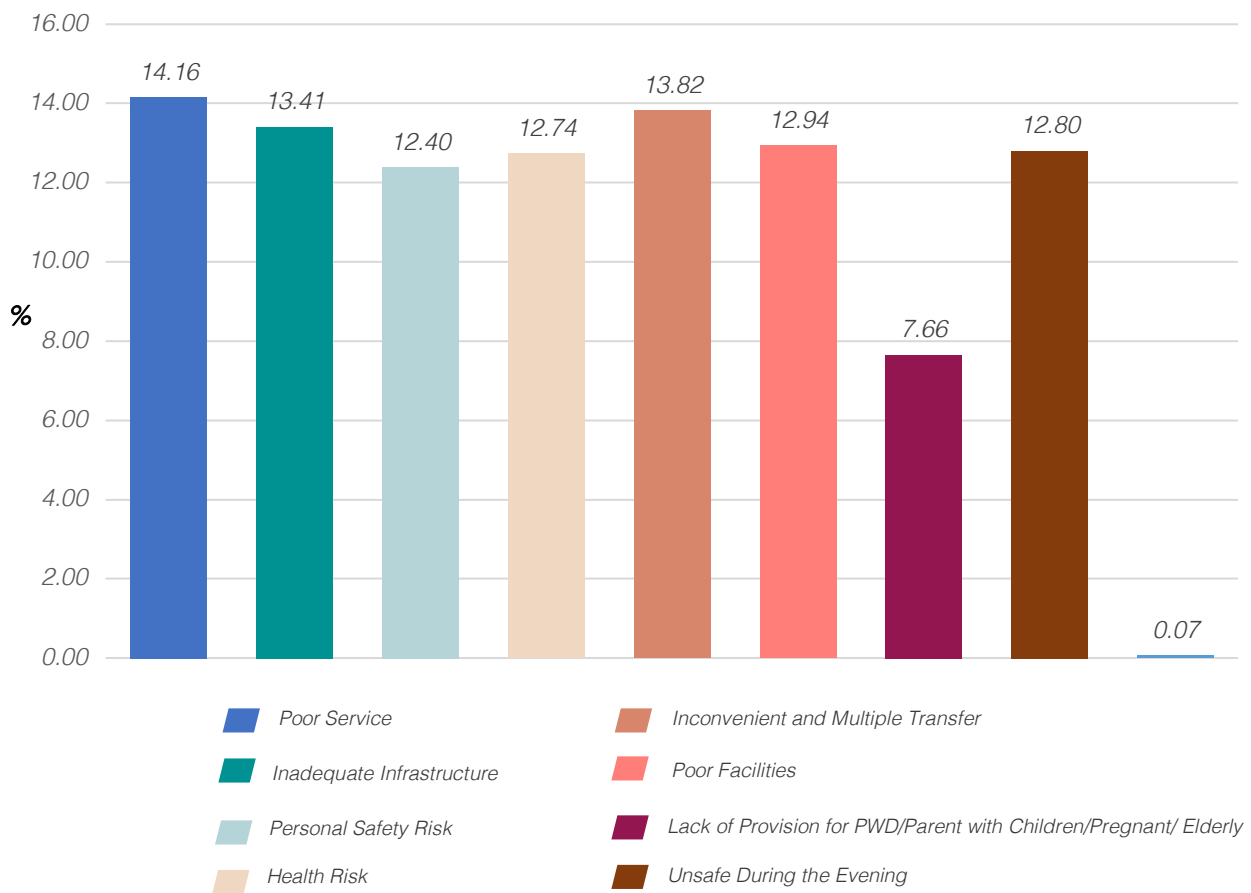


Figure 15: Perceive as being significant problem on the public transport

#### 2.2.4 COVID-19 impact on mobility

The COVID-19 coronavirus outbreak that started in 2020 is changing our behavior. Restrictions that were put in place to limit the diffusion and impacts of Covid-19 have had a widespread impact on people's lives, including urban mobility (United Nations, 2020).

Medimorec et al., (2020); report on the impacts of COVID-19 on mobility. Analyzed data showed fewer people traveling to workplaces, retail/recreation and public transport stations. In all regions, the percentage of trips to workplaces, retail/recreation, and public transport stations decreased by 40 percent. In countries severely impacted by COVID-19, national and local lockdowns have restricted mobility to essential services only.

This has also influenced how public transport is utilized. There has been a marked decline in public transport service uptake with fewer people traveling by public transport. This is mainly due to social distancing (people avoiding being too close to each other) and maintaining the required area density (people avoiding being in a crowded place with others, too).

When student respondents were asked if they changed their behavior in the use of public transport, it was found that 44 percent of the respondents indicated that the reason for the change in their mode of travel was to avoid public transport because they feared that they would get sick and contract COVID-19 from other commuters. This was followed by a change to a healthy lifestyle, which was accounted for 29 percent of the responses. At the same time, travel delays due to routes checkpoints and road closure was accounted for 12 percent of the responses.

To apply binary logistic regression to advance understanding of the factors that influenced these changes. The purpose is to improve our understanding of the change in travel behavior and public transport uptake.

The analysis showed that two factors that are significantly associated with the change in travel patterns are: *household monthly income* factor (Sig = 0.058) and *length of residence* (Sig = 0.016).

The high-income sample subgroup has the opportunity to make decisions in changing their travel behavior to consider alternative transport options.

The choices of traveling include public transport and private car, personal motorcycle, motorcycles taxi, bicycles, and pedestrians. The most commonly used modes of transport are private cars and public transport.

The sample group with a length of stay of less than five years of residence are those students living and staying in university-provided accommodations such as dormitories and the like. Also, during the pandemic, students were encouraged to move back to their hometowns as instructions moved to online teaching and learning. In such a scenario, students were not compelled to travel, which has significantly changed their motivation and decision to use or not use public transport.

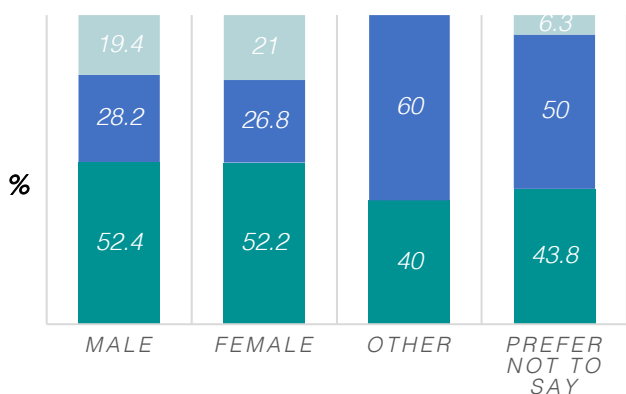


Fig 16.1: Gender

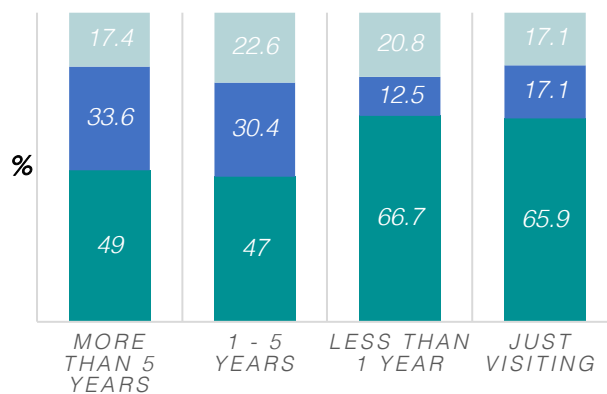


Fig 16.2: Living

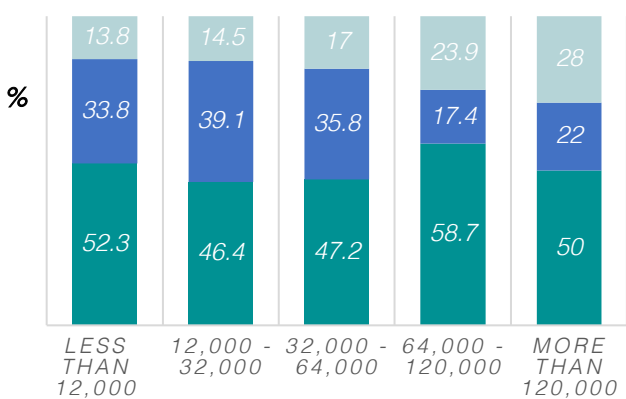


Fig 16.3: Household Income

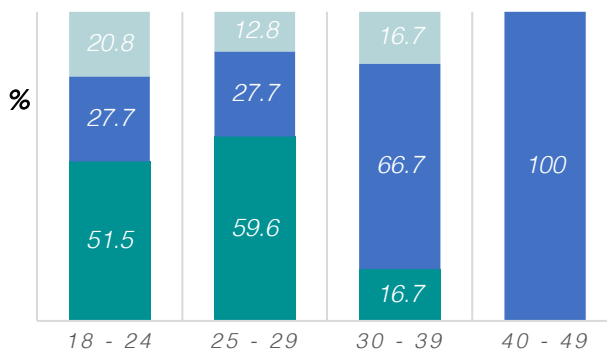


Fig 16.4: Age

Figure 16: Travel behaviour change during COVID-19



## 2.3 Challenges and Recommendations

### 2.3.1 Common challenges and concern

Student respondents were queried on the important issues that needs to be considered when using public transport.

Results of the survey showed that approximately 15 percent of students agreed that the slow route, the long duration of the journey (long travel time), congestion and traffic delay due to increasing traffic volume and using public transport usually requires several transfers are some of the challenges and concerns that limit public transport uptake.

In addition, almost 14 percent indicated that the cleanliness of the buses and the overall public transport environment need to be addressed at the fundamental level.

Around 12 percent noted that services needed to improve so that it can be more punctual and reliable. Details are provided in Fig. 17.

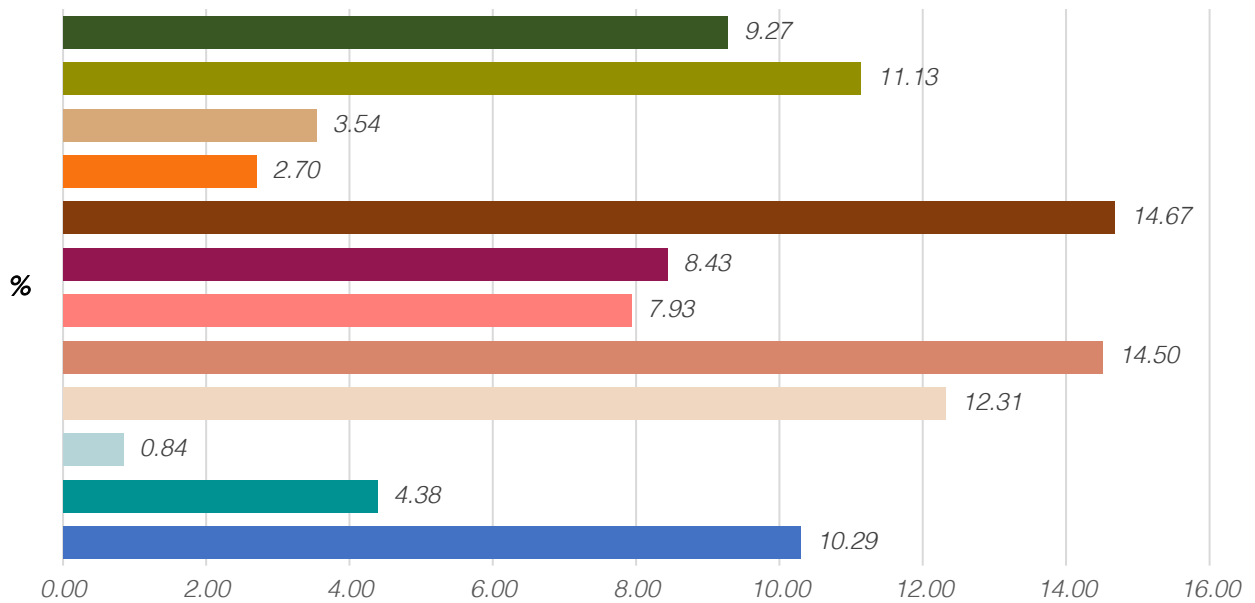


Figure 17: Significant problem on public transport by students using transit

- Public transport cost/fare
- Dirty public transportation schedule and ticket information
- Unsafe during the daytime
- Fear of traffic accident or crashes
- Lack of public transportation schedule and ticket information
- Unsafe during the evening
- Fear of terrorist attack
- Living in areas or routes without public transport access
- Overcrowded service on station and on-board
- Unreliable or infrequent public Transport service
- Slow route journey time i.e. congestin, delays and lots of transfers
- More likely to use personal automobile as compared to the public transport

### 2.3.1 Recommendations

Student respondents were also asked to identify three system-wide suggestions, strategies, or initiatives to improve transit safety, making overall public transport travel safer.

There is a general sentiment amongst the student respondents that opportunities to improve the public transport system abound.

One crucial strategy that student respondents mentioned was *improving lighting in waiting areas, public transport areas, well-ventilated public transport, and accessibility for senior citizens and differently-abled persons, women, and children.*

Illuminating the public transport environments, mainly during evenings when the perception of safety is generally bad, is a low-cost, easy-to-implement strategy that can reduce the risk of harassment and accident in public areas.

Incorporating accessible design in transit environments is one way to accommodate older populations' mobility and accessibility needs and people living with disabilities. This is an important initiative, which proactively considers that people have different needs as commuters and as people acquire specific disabilities as they age. This means that systematic improvements are fundamental to transport service providers.

Police presence to regularly patrol and inspect the public transport areas, CCTV has been identified as the second priority. Others have identified that there should be a reliable public transport system.





Image 4: By Jaromir Kaven, Unsplash, 2019,  
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## 2.4 Conclusion

The COVID-19 is changing our behavior and the restrictions put in place to limit the diffusion and impacts of Covid-19 have had a widespread impact on people's lives, especially urban mobility changing (United Nations, 2020). Medimorec et al. (2020) presented the report of impacts of COVID-19 on mobility; the data analysis showed that fewer people are traveling to workplaces, retail/recreation and public transport stations. In all regions, the percentage of trips to workplaces, retail/recreation, and public transport stations decreased by 40 percent. In countries severely impacted by COVID-19, national and local lockdowns have restricted mobility to essential services only (Medimorec et al., 2020).

The physical features of campus communities are concerned with two types of users: students and non-students. Both target groups are being considerate for improving their living conditions, including quality of commuting. It must integrate all-inclusive built environmental features for transportation services, including public access, parking solutions, and service deliveries (Bagnoli, 2012). Concerning sexual harassment, while traveling, it was found that both men and women felt safe during the day when traveling by public transport during the night. Especially, females feel unsafe to travel and some choose not to travel with public transport at all. The majority of harassment while traveling was verbal harassment from 15 to 20 percent. However, some 10 to 15 percent of non-verbal harassment was received. The problems of public transport services that need significant improvements are cleanliness of buses and surroundings, showing travel routes, travel times and change points in each route and punctuality of buses.

There is also the issue of improving the lighting in waiting areas for public transport systems and areas for facilitating public transport having the police patrol and inspect the public transport service area regularly and have CCTV, including public transport in particular "women only" is an issue that needs to be taken into account in serving students around the

university. In addition, from the study results, the impacts of COVID-19 on student travel behavior in Thammasat University demonstrated that various travel styles are available for students on the campus at a reasonable fare. The choices of traveling include public transport, private car, personal motorcycle, motorcycles taxi, bicycles, pedestrians, however, the most commonly used modes of transport are private cars and public transport.

It pointed to the impact on student travel during the viral epidemic, which prompted students to change travel behavior to avoid public transport for fear of being sick with COVID19 and changed to a healthy lifestyle. However, when considering the social and economic factors affecting the decision-making in the travel style change, the most important factor influencing is the economic factor that limits their affordability to choose traveling. Household monthly income has become the key factor for university group choice-making and extending the time of residence. It can be seen that these factors reflect obstacles to student travel patterns. With income restrictions and living in non-residence areas, the university must provide online learning options for all students, resulting in students being able to return to study at home. The disruptive learning platform has been causing the traveling behavior in the campus area to change significantly. However, such a change is good for everyone to avoid close contact and maintain a social distance to reduce the epidemic. On the other hand, improving and developing the service system and inclusive public transportation choice should be ready to cope with the spread of the Coronavirus 2019.

## References

- Thammasat University. Thammasat University Information. Retrieved 20 March 2021 from <https://www.reg.tu.ac.th/th/Post/category/176>
- Pathum Thani Office of Public Works and Town & Country Planning (2017) Building use. Databases.
- Iamtrakul, P. Chayphong, S. (2021). The Perception of Pathumthani Residents toward Its Environmental Quality, Suburban Area of Thailand. *Geographica Pannonica*, 25(2), 136-148.
- Iamtrakul, P. Raungratanaamporn, I.- soon. Klaylee, J. (2018) The Impact of Urban Development on Social Capital in Urban Fringe Area of Bangkok, Thailand. *Lowland Technology International*, 20(3), 331-340.
- Department of Land Transport. Number of Registered Vehicle in 2020. Retrieved 20 March 2021 from [https://view.officeapps.live.com/op/view.aspx?src=http%3A%2F%2Fstatbbi.nso.go.th%2Fstaticreport%2FPage%2Fsector%2FTH%2Freport%2Fsector\\_15\\_10201\\_TH\\_.xlsx&wdOrigin=BROWSELINK](https://view.officeapps.live.com/op/view.aspx?src=http%3A%2F%2Fstatbbi.nso.go.th%2Fstaticreport%2FPage%2Fsector%2FTH%2Freport%2Fsector_15_10201_TH_.xlsx&wdOrigin=BROWSELINK)
- Ceccato, V. and Loukaitou-Sideris, A. (forthcoming 2020) *Transit Crime and Sexual Violence in Cities: International Evidence and Prevention*. New York: Routledge.
- Natajaran, M. Schmuhl, M. Sudula, S. Mandala, M. (2017) Sexual Victimization of College Students in Public Transport Environments: A Whole Journey Approach. *Crime Prevention and Community Safety*, 19, 168–18.
- Bagnoli. D. C. (2012) *Integration, Revitalization and transportation: Smart growth opportunities for a small city campus: Benefits of a balanced town-gown relationship*. Retrieved 14 February 2021 from <http://www.oregon.gov/lcd/tgm/docs/bagnolippt102312.pdf>
- United Nations (2020) *The Impact of The Covid-19 Pandemic on Trade and Development: Transitioning to A New Normal*. United Nations, New York.
- Medimorec, N. Enriquez, A. Hosek, E. Peet, K. Cortez, A. (2020) *Impacts of COVID-19 on Mobility*. SLOCAT Partnership, P6-P11.

## Images

- Cover Image: Unsplash (2019) Unsplash. <https://unsplash.com/photos/KYvhBKLzovw>
- Image 2: Unsplash (2017). Unsplash. <https://unsplash.com/photos/-y3sidWvDxg>
- Image 3: Unsplash (2018). Unsplash. <https://unsplash.com/photos/zm438klkxU4>
- Image 4: By Jaromir Kaven, Unsplash, 2019  
[https://unsplash.com/photos/l2\\_5m1RG0Ac](https://unsplash.com/photos/l2_5m1RG0Ac)

## List of Figures

Figure 1: Student population size in Thammasat University, Rangsit campus

Figure 2: University officials population size in Thammasat University, Rangsit campus

Figure 3: Response by gender

Figure 4: Response by age

Figure 5: Before and during COVID-19 pandemic

*Fig 5.1a: Gender, before COVID*

*Fig 5.1b: Gender, during COVID*

*Fig 5.2a: Age, pre-COVID*

*Fig 5.2b: Age, during COVID*

Figure 6: Histograms of the experienced harassment

Figure 7: Proportion of experienced harassment while riding/ taking the public transport

Figure 8: Proportion of experienced harassment while waiting area for the public transport

Figure 9: Proportion of experienced harassment while heading to the waiting area for the public transport

Figure 10: Proportion experienced harassment while riding/taking, waiting area and heading to the waiting area for the public transport by gender

*Fig. 10.1: Results of experienced any of the following while riding/ taking the public transport by gender*

*Fig. 10.2: Results of experienced any of the following while at the waiting area for public transport by gender*

Figure 11: Results of safety during daytime and after dark while using public transport

*Fig. 11.1: During the daytime, Fig 11.2: after dark*

Figure 12: React/Took action/Take precautionary measures

Figure 13: Perception of safety during daytime and after dark while using public transport

Figure 14: Safety during daytime while traveling to stop/terminal for public transport

Figure 15: Perceive as being significant problem on the public transport

Figure 16: Travel behaviour change during COVID-19

*Fig 16.1: Gender, Fig 16.2: Living, Fig. 16.3: Household monthly income, Fig 16.4: Age*

Figure 17: Significant problem on public transport by students using transit value

## Appendix

**Table 1.** Descriptive of respondent's profile

Items	Category	Frequency (N)	Percent (%)
Gender	Male	103	31.31
	Female	205	62.31
	Other	5	1.52
	Prefer not to answer	16	4.86
Age	18-24 years old	274	83.28
	25-29 years old	47	14.29
	30-39 years old	6	1.82
	40-49 years old	2	0.61
Education	Some High School or High School	163	49.54
	Bachelor's Degree	134	40.73
	Master's Degree	22	6.69
	PHD or higher	1	0.30
	Prefer not to say	9	2.74
Marital status	No, I am Single/separated/divorced	309	93.92
	Yes, Married w/ children	4	1.22
	Yes, Married w/o a child	2	0.61
	Prefer not to say	14	4.26
Employments	Employed Full-Time	35	10.64
	Employed Part-Time	26	7.90
	Seeking opportunities	98	29.79
	Retired	7	2.13
	Prefer not to say	163	49.54
Household monthly income (baht)	<= 12,000 Baht	65	19.76
	12,000 - 32,000 Baht	69	20.97
	32,000 - 64,000 Baht	53	16.11
	64,000 - 120,000 Baht	92	27.96
	More than 120,000 Baht	50	15.20
Living	Longer than 5 years	149	45.29
	1-5 years	115	34.95
	Less than 1 year	24	7.30
	Just visiting the city	41	12.46
<b>Total</b>		329	100.00

**Figure 5:** Before and during COVID-19 pandemic

Factors Value		Before COVID-19 (%)		During COVID-19 (%)	
		Everday (Frequently (4-7 times weekly))	Once or twice (Less frequently (0-3 times weekly))	Everday (Frequently (4-7 times weekly))	Once or twice (Less frequently (0-3 times weekly))
<b>Gender</b>	Male	19.4	80.6	17.5	82.5
	Female	38.6	61.4	10.9	89.1
	Other	0.0	100.0	0.0	100.0
	Prefer not to say	20.0	80.0	6.3	93.7
<b>Age</b>	18 - 24	31.3	68.7	13.3	86.7
	25 - 29	30.4	69.6	10.6	89.4
	30 - 39	20.0	80.0	0.0	100.0
	40 - 49	100.0	0.0	0.0	100.0

**Figure 6.** Histograms of the experienced harassment

Factors Value	Riding/Taking the Public Transport	Waiting Area for the Public Transport	Heading to the Waiting Area for the Public Transport
Mean	1.626	1.535	1.474
Std. Deviation	1.046	0.969	0.960
Variance	1.095	0.939	0.921
Skewness	1.454	1.814	2.053
Std. Error of Skewness	0.134	0.134	0.134
Kurtosis	0.604	2.147	2.972
Std. Error of Kurtosis	0.268	0.268	0.268
Minimum	1.000	1.000	1.000
Maximum	4.000	5.000	5.000

**Figure 7.** Proportion of experienced harassment while riding/taking the public transport

Factors Value		Frequency	Percent
<b>Experienced any of the following while RIDING/TAKING THE PUBLIC TRANSPORT</b>	Never experienced harassment	223	67.78
	Verbal	47	14.29
	Physical	18	5.47
	Non-verbal	41	12.46
	Other	0	0.00
<b>Total</b>		<b>329</b>	<b>100.00</b>

**Figure 8.** Proportion of experienced harassment while waiting area for the public transport

Factors Value		Frequency	Percent
<b>Experienced any of the following while AT THE WAITING AREA FOR THE PUBLIC TRANSPORT</b>	Never experienced harassment	230	69.9
	Verbal	56	17.0
	Physical	11	3.3
	Non-verbal	30	9.1
	Other	2	0.6
<b>Total</b>		<b>329</b>	<b>100.00</b>

**Figure 9.** Proportion of experienced harassment while heading to the waiting area for the public transport

Factors Value		Frequency	Percent
<b>Experienced any of the following while HEADING TO THE WAITING AREA FOR THE PUBLIC TRANSPORT</b>	Never experienced harassment	245	74.5
	Verbal	48	14.6
	Physical	2	0.6
	Non-verbal	32	9.7
	Other	2	0.6
<b>Total</b>		<b>329</b>	<b>100.00</b>

**Figure 10.** Proportion experienced harassment while riding/ taking, waiting, and heading to public transport by gender

*Fig. 10.1: Results of experienced any of the following while riding/ taking the public transport by gender*

Factors Value	Male	Female	Other	Prefer not to answer	Total (%)
Never Experienced Harassment	25.23	40.12	1.52	0.91	67.78
Verbal	3.34	7.90	0.00	3.04	14.29
Physical	0.61	4.86	0.00	0.00	5.47
Non-verbal	2.13	9.42	0.00	0.91	12.46
Other	0.00	0.00	0.00	0.00	0.00
<b>Total</b>	<b>31.31</b>	<b>62.31</b>	<b>1.52</b>	<b>4.86</b>	<b>100.00</b>

*Fig. 10.2: Results of experienced any of the following while at the waiting area for public transport by gender*

Factors Value	Male	Female	Other	Prefer not to answer	Total (%)
Never Experienced Harassment	26.14	41.03	0.91	1.82	69.91
Verbal	3.95	10.94	0.30	1.82	17.02
Physical	0.00	2.43	0.00	0.91	3.34
Non-verbal	1.22	7.60	0.00	0.30	9.12
Other	0.00	0.30	0.30	0.00	0.61
<b>Total</b>	<b>31.31</b>	<b>62.31</b>	<b>1.52</b>	<b>4.86</b>	<b>100.00</b>

**Figure 11:** Results of safety during daytime and after dark while using public transport

Factors Value	During Daytime				After Dark			
	Safe Using		Safe Walking		Safe Using		Safe Walking	
	Frequency (N)	Percent (%)	Frequency (N)	Percent (%)	Frequency (N)	Percent (%)	Frequency (N)	Percent (%)
Yes	196	59.57	161	48.94	58	17.74	50	15.20
No	133	40.43	168	51.06	269	82.26	258	78.42
Never take public transport after dark	0	0.00	0	0.00	0	0.00	21	6.38
<b>Total</b>	<b>329</b>	<b>100.00</b>	<b>329</b>	<b>100.00</b>	<b>329</b>	<b>100.00</b>	<b>329</b>	<b>100.00</b>

**Figure 12:** React/Took action/Take precautionary measures

Factor Value	Called/asked help from Police (1)	Confronted the harasser (2)	Asked others for help/got support from people around (3)	Carrying some kind of a weapon (4)	Dress a certain way/do not wear jewelry/avoid carrying purse or wallet (5)	Avoid specific public transport stations/stops (6)	if other people are around or at daytime (7)	Other (8)	Total (%)
Frequency (N)	7	18	29	9	10	14	11	0	98
Percent (%)	7.14	18.37	29.59	9.18	10.20	14.29	11.22	0.00	100.00

**Figure 13:** Perception of safety during daytime and after dark while using public transport

Factors Value		Male	Female	Other	Prefer not to answer
Safety using daytime	Yes	59.22	59.02	80.00	62.50
	No	40.78	40.98	20.00	37.50
	Total (%)	100.00	100.00	100.00	100.00
Safety using dark	Yes	29.13	11.33	40.00	18.75
	No	70.87	88.67	60.00	81.25
	Total (%)	100.00	100.00	100.00	100.00
Safety walking dark	Yes	24.27	10.73	20.00	12.50
	No	68.93	83.90	20.00	87.50
	I never take public transport after dark	6.80	5.37	60.00	0.00
	Total (%)	100.00	100.00	100.00	100.00

**Figure 14:** Safety during daytime while traveling to stop/terminal for public transport

Factors Value		Male	Female	Other	Prefer not to answer
Safety walking daytime	Yes	57.28	43.90	60.00	56.25
	No	42.72	56.10	40.00	43.75
	Total (%)	100.00	100.00	100.00	100.00
Safety waiting daytime	Yes	54.37	52.20	60.00	43.75
	No	45.63	47.80	40.00	56.25
	Total (%)	100.00	100.00	100.00	100.00

**Figure 15:** Perceive as being significant problem on the public transport

Perceive as being a significant problem on the public transport	Frequency (N)	Percent (%)
Poor service	209	14.16
Inadequate infrastructure	198	13.41
Personal safety risk	183	12.40
Health risk	188	12.74
Inconvenient and multiple transfer	204	13.82
Poor facilities	191	12.94
Lack of provision for PWD/parent with children/pregnant/elderly	113	7.66
Unsafe during the evening	189	12.80
Other	1	0.07
<b>Total</b>	<b>1,476</b>	<b>100.00</b>

**Figure 16:** Travel behaviour change during COVID-19

Variables	Before (56 out of 329)		During (16 out of 329)		During-Before (n)	Change (%)	Mode Change during COVID-19			
	n	%	n	%			Yes	No	Maybe	
<b>Total</b>	<b>56</b>	<b>100</b>	<b>16</b>	<b>28.6</b>	<b>-40</b>	<b>-71.4</b>	<b>51.7</b>	<b>28.9</b>	<b>19.5</b>	
Gender	Male	13	23.2	8	50	-5	-8.9%	52.4%	28.2%	19.4%
	Female	42	75.0	8	50	-34	-60.7%	52.2%	26.8%	21.0%
	Others	0	0.0	0	0	0	0.0%	40.0%	60.0%	0.0%
	Prefer not to answer	1	1.8	0	0	-1	-1.8%	43.8%	50.0%	6.3%
Age (years)	18-24	49	87.5	14	87.5	-35	-62.5%	51.5%	27.7%	20.8%
	25-29	5	8.9	2	12.5	-3	-5.4%	59.6%	27.7%	12.8%
	30-39	1	1.8	0	0	-1	-1.8%	16.7%	66.7%	16.7%
	40-49	1	1.8	0	0	-1	-1.8%	0.0%	100.0%	0.0%
Household monthly income (baht)	<= 12,000	10	17.9	7	43.8	-3	-5.4%	52.3%	33.8%	13.8%
	12,000 - 32,000	22	39.3	5	31.3	-17	-30.4%	46.4%	39.1%	14.5%
	32,000 - 64,000	7	12.5	1	6.3	-6	-10.7%	47.2%	35.8%	17.0%
	64,000 - 120,000	14	25.0	3	18.8	-11	-19.6%	58.7%	17.4%	23.9%
	More than 120,000	3	5.4	0	0.0	-3	-5.4%	50.0%	22.0%	28.0%
Residential period (years)	Longer than 5 years	27	48.2	10	62.5	-17	-30.4%	49.0%	33.6%	17.4%
	1-5 years	21	37.5	6	37.5	-15	-26.8%	47.0%	30.4%	22.6%
	Less than 1 year	4	7.1	0	0.0	-4	-7.1%	66.7%	12.5%	20.8%
	Just visit	4	7.1	0	0.0	-4	-7.1%	65.9%	17.1%	17.1%



**Figure 17:** Significant problem on public transport by students using transit

<b>Which of the following prevent you from using public transport more often?</b>	<b>Frequency (N)</b>	<b>Percent (%)</b>
Public transport cost/fare	61	10.29
Fear of traffic accident or crashes	26	4.38
Fear of terrorist attack	5	0.84
Unreliable or infrequent public transport service	73	12.31
Dirty public transport environment in station, along the route and inside the public transport	86	14.50
Lack of public transportation schedule and ticket information	47	7.93
Living in areas or routes without public transport access	50	8.43
Slow route journey time i.e.congestion, delays, and lots of transfers	87	14.67
Unsafe during the daytime (accidents, crime, harrasment, violence)	16	2.70
Unsafe during the evening (accidents, crime, harrasment, violence)	21	3.54
Overcrowded service on station and on-board the public transportation	66	11.13
More likely to use personal automobile as compared to the public transport	55	9.27
Other	0	0.00
<b>Total</b>	<b>593</b>	<b>100</b>



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