Public Transport, Sexual Harassment, and Social Norms: Some Evidence from South Africa

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Abstract

Research has highlighted various challenges facing public transport users, particularly women. We conduct a survey of 1000 male and female public transport users in South Africa to better understand the commuting experiences of these users, including vulnerability to sexual harassment and violence. Most of our findings support existing research that women are selective in their transport modes based on safety and accessibility in relation to men. We also note that both women and men overestimate other commuters' tolerance for sexual harassment and unwanted sexual advances in the public transport setting, findings similar to emerging literature on social norms in public spaces. This finding could be leveraged in policies highlighting that most public transport users find such behaviours unacceptable. Existing research on the positive effects on behaviour of correcting erroneous normative beliefs suggests that communicating accurate norms might reduce engagement in behaviour (such as sexual harassment) that deviates from the accepted norms.

Keywords: Gender, public transport, social norms, sexual harassment, South Africa

JEL Codes: J16, R41, D91, O55

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1 Introduction

The need for inclusive and sustainable development in urban areas has been emphasised globally, as witnessed by several agreements such as the UN 2030 agenda, the 2016 New Urban Agenda,[1] the 2015 Paris Climate Agreement,[2] the Convention on the Elimination of all forms of Discrimination Against Women (CEDAW),[3] and the Sustainable Development Goals (SDGs).[4] Specifically SDG 11 speaks to the need for sustainable cities and communities in which countries should provide access to safe, affordable, accessible, and sustainable transport systems for all, with special attention to the needs of those in vulnerable situations, including women, children, persons with disabilities and older persons.

South Africa has been experiencing rapid urbanisation, with 63% of the population currently living in urban areas, projected to rise to 71% by 2030 (COGTA, 2024). The Parliamentary Monitoring Group predicts that by 2050, 8 in 10 people will be living in urban areas, leading to an increase in demand for basic infrastructure. This growth makes transport a critical role player in the economy, necessitating the need to improve the coverage and frequency of transport systems in the country. At the same time, the rising urbanisation is affording women more opportunities to enter the labour market (Dunn, 2024; Dunn & Maharaj, 2025; Mitra, 2019) which means more women are likely to be making use of the transport system.

However, according to existing evidence, particularly from developing regions such as Africa and South Asia, women and men have different experiences with accessing and using public transport in terms of frequency and affordability of transport, as well as personal safety and security (UN, 2014; Moghayedi et al., 2023). Various studies indicate that women walk longer distances and use public transport more frequently than men due to their responsibility over household chores (Riverson, Kunieda, Roberts, Lewi, & Walker, 2006). They are also less likely to afford private transport (Harrison, 2012) and are often excluded from public transport when it is overcrowded (International Transport Forum,

[1] United Nations General Assembly, 2016.
[2] United Nations, 2015.
[3] Convention on the Elimination of All Forms of Discrimination against Women. Adopted and opened for signature, ratification and accession by General Assembly, resolution 34/180 of 18 December 1979.
[4] United Nations Statistical Commission, 2016.

2011). Clarke (2012) emphasised that transport should not be perceived as a gender-neutral phenomenon because men and women are affected differently, whether in the form of time, distance, mode of transport, or reason for travel. As such, transport policies need to acknowledge and address these differences. However, the European Institute for Gender Equality (2019) states that throughout history, transport systems have functioned in ways that tend to prioritise men's needs over those of women. This could be attributed to cultural practices that insisted on domesticating women while overlooking the fact that even domestic duties necessitate viable transportation systems (StatsSA, 2021). As a result, women tend to be the most affected by the state of public transportation, particularly with respect to experiences of sexual violence and harassment (UN, 2014).

Several national frameworks and policies related to urban safety and integrated transport planning exist in South Africa (e.g. National Transport Policy White Paper 1996 (revised 2017) (NDoT, 2017), National Land Transport Act (NDoT, 2009)). In spite of these policies, commuters, especially women, still feel unsafe while using public transport (Mabaso, 2019). Unfortunately, gender considerations are largely absent or receive little attention in transport policies, planning and project development (Aloul, Naffa, & Mansour, 2019; Kacharo, Teshome, & Woltamo, 2022) beyond the mention of women as special needs passengers who are limited in their movements by children (Mabaso, 2019; Jennings, Mosshammer, Minovi, & Munoz-Raskin, 2022). This results in transportation systems and spaces that not only exclude women but are also unsafe for them (Rampaul & Magidimisha-Chipungu, 2022).

Furthermore, while discourse in the literature includes a focus on understanding intimate partner violence (IPV) (Agenagnew, Tebeje, & Tilahun, 2020; Bahati, Izabayo, Munezero, Niyonsenga, & Mutesa, 2022; Park et al., 2021), we find limited empirical research that discusses gender based violence in public spaces, such as transport. In these spaces, commuters tend to be vulnerable, particularly those who may travel alone (Azizan, Mohamed, Abd Rahman, & Aziz, 2016; Porter et al., 2025). The perpetrator is also more likely to be a stranger.

Given the increasing demand for transport infrastructure and the gender knowledge gap in transport policies in South Africa, it is worthwhile to examine the dynamics involved in commuting behaviour so that we have a better understanding of the factors

that influence the choices commuters make to use public transportation. By doing so, this research provides us with an opportunity to contribute additional evidence related to ensuring sustainable cities, with a specific focus on promoting safe public transport for all, including vulnerable populations such as women (StatsSA, 2021). Our research also contributes findings that may assist in designing policies informed by evidence. According to Aloul et al. (2019) gender is seldom a focal point in transportation policy and planning, and conversely, transportation is infrequently addressed within gender policy discussions, making this field of "gender and transportation" a relatively new concept.

Within this context, we pose the following research questions: 1) What are the commuter characteristics associated with the use of public transportation in South Africa?, 2) What are the perceptions of risk that are associated with the use of public transportation? and 3) How do transport users perceive social norms, particularly with regard to sexual harassment, associated with public transportation? We argue that commuters' decisions to use public transport may be based not only on demographics (age, race, income, etc.), but also on the perceptions of risk, and other issues, such as the accessibility (i.e., coverage), affordability, and availability (i.e., frequency) of the public transport mode. We also propose that people's beliefs about acceptable behaviours in public spaces may provide insights as to why sexual violence and harassment in public transport may be tolerated. We are particularly interested in the gender differences in travel behaviour, perceptions of risk and social norms.

investigate issues related to public transport use, we conduct an online survey of ~1000 public transport commuters in South Africa using a questionnaire distributed by survey provider TGM Research in April/May 2024. The survey includes questions about respondents' use of transport, risk perceptions, as well as questions related to violence and sexual harassment in the public transport context. We also ask respondents to report on their own beliefs about the acceptability of a range of behaviours, as well as their beliefs about other men and women's perceptions of these behaviours.

We start by considering some descriptive data highlighting gender differences in public transport users. This includes demographic differences (e.g. age, education) between male and female users, as well as behavioural differences (travel time, number of trips, etc.). In this way we can see whether existing research findings on gender differences in public

transport use persist in our sample. Next, we consider risks such as sexual harassment and violence in public transport use, and how people perceive and respond to these risks. We look at the profile of transport users reporting higher susceptibility to these risks, and we investigate people's willingness to report such incidents, and the extent to which they go underreported. Finally, we consider attitudes towards sexual harassment on public transport. Here we first look at the prevalence of acceptance of such behaviours among male and female transport users. We then investigate gaps between people's own beliefs and their perceptions of other's beliefs about acceptability of these behaviours. This is done with a view to identifying areas where transport users incorrectly believe others to be more accepting of inappropriate behaviours than the others' responses suggest. These gaps point to potential levers for policy communications aimed at addressing sexual harassment in the public transport space.

The findings show that a higher proportion of women than men choose not to use trains and buses based on accessibility and safety. We also find that women are more likely to feel comfortable to report incidences of violence and harassment to female security than male security. Of concern is that a relatively higher share of women than men cite "nothing will change" and "scared of victimisation by authorities" as reasons for not reporting incidences of harassment. In terms of beliefs, we find that more men than women believe that women are tolerant of sexual advances on public transport. This suggests that men's erroneous beliefs about women's attitudes might increase the lack of safety that women experience on public transport.

By exploring some of these dynamics in commuters' decisions to use public transport, the study provides insights into the gender-specific challenges and experiences women face when using public transportation. For example, a systematic review of studies conducted by Mchunu et al. (2025) on public transport and safety of female commuters reveals several gaps that still need to be explored: 1) more comprehensive understanding of the challenges faced by women in public transport is required in low and middle income countries, 2) diversified research methods are necessary to offer key insights into the nuanced facets of women's experiences and perceptions of using public transport (Porter et al., 2025), and 3) policy reforms that promote public awareness, and improve reporting mechanisms and infrastructure are needed to address safety concerns in public transport (Rasca & Saeed,

2022). The study contributes to the field of transportation and urban planning by offering valuable data and considerations for urban planners and transportation authorities to design more inclusive and safe transportation systems.

2 Related literature

Public transport is a critical service that links people to economic opportunities, vital social services, such as education and healthcare, and civil engagement. Studies show a positive correlation between investment in safe public transport and employment, especially in poorer areas, with more recent evidence indicating a disproportionate benefit for women relative to men (Boisjoly, Moreno-Monroy, & El-Geneidy, 2017; Martinez, Mitnik, Salgado, Scholl, & Yañez-Pagans, 2020; Seki & Yamada, 2020). However, evidence suggests that women and men travel differently (Clarke, 2012;UN, 2014). For example, in developing countries, women tend to walk longer distances, particularly in rural areas where motorised transport is limited (Foley et al., 2022); rely on public transport more frequently than men when they travel (Riverson et al., 2006; Borker et al., 2021); and tend to make more frequent, shorter trips with more stops along the way to combine multiple tasks that are not related to paid employment (Dominguez Gonzalez et al., 2020). Using a mixed-methods systematic review for African countries, Foley et al. (2022) finds that women and girls are more likely to travel by walking or to use paratransit (i.e., informal public transport, such as minibuses or motorcylce taxis). These findings are echoed by Mbara (2016) and Machado-León, de Oña, Baouni, and de Oña (2017). Reasons suggested for women walking or using informal public transport are lack of access to private vehicles or because their activities involve more load-carrying due to household tasks, such as collecting firewood on foot, especially in the rural areas (Porter et al., 2013).

Women's limited access to financial resources also makes them more dependent on public transport and results in their using it more frequently than men do (Dominguez Gonzalez et al., 2020). For example, in several countries across the world such as Ghana, South Africa, Argentina, Peru, Mexico and India, a higher share of women than men use public transport for commuting to work in urban areas (Goel et al., 2023) or for carrying out unpaid work (e.g. non-paid services such as cooking, cleaning, childcare, elderly care, and

other essential tasks that maintain the well-being of individuals and households). A study on the gender inequality of unpaid work shows that about 70% of care trips are undertaken by women in Ireland, Italy, Portugal and Colombia (Vaalavuo, 2016). Unfortunately, the burden of unpaid work adds an additional strain to women through trip chaining (i.e., combining several tasks, such as going to work, childcare and shopping into one trip). Trip chaining tends to increase the costs of public transportation for women, whereas men tend to have more direct and linear patterns (e.g. travel to work and back home) (Allen & Vanderschuren, 2016; Shah, Viswanath, Vyas, & Gadepalli, 2017). StatsSA (2021) notes that lack of easily accessible public transportation undermines the gains made by the government in their plans for economic emancipation of girls and women with serious implications on their contribution to the economy and national development of the country.

Health issues for women are also linked to transportation. The lack of easily accessible transport in remote areas means women, who predominantly undertake the household chores, have to carry loads heavier than their bodies over long distances, as evidenced in a study conducted in Ethiopia (Peters, 2001). In addition, distance continues to pose a health issue in rural areas as women have to travel long distances to access healthcare (Priya Uteng & Turner, 2019).

According to Alam and Karvajal (2018), women represent the largest share of public transport users around the world, yet they face many barriers that limit their mobility (e.g., catcalling, unwanted attention, inappropriate physical contact, aggressive advances from strangers, and physical assault). The perceived risks associated with harassment and violence in public transport can impose an additional cost on women commuters by discouraging them from market participation (Velásquez, 2020), from choosing better schools (Borker et al., 2021) or from accessing healthcare services.

Findings from Borker et al. (2021) also show that women in India are willing to choose a lower ranked college, are willing to incur additional travel time to college and/or are willing to pay extra money for travelling to college on a route that is safer to avoid sexual harassment. Young girls in South Africa walk to school in groups to avoid sexual harassment (Porter et al., 2017). Evidence from sub-Saharan Africa also highlights that transport poverty (i.e., inaccessible, or unsuitable transport that adversely affects a

person's wellbeing) disproportionately impacts women in terms of harassment, getting to school and accessing jobs (Harrisberg, 2020). In South Africa, over half the population, mainly women, depend on public transport to get to work or for leisure activities, and yet according to a 2019 index by the Georgetown Institute for Women, Peace and Security that measured safety in 167 countries, only about 25% of South African women feel safe walking at night (Harrisberg, 2020).

Violence against women and girls (VAWG) undermines the mental and physical health and well-being of women and girls and has a negative impact on their long-term sense of safety, stability, and peace (Alexander-Scott, Bell, & Holden, 2016). According to Peters (2013), safety is a major issue that disproportionately affects women and girls while using public transportation. For example, Neupane and Chesney-Lind (2014) state that in urban areas, younger and unmarried women are often prime targets for such abuse. Further evidence by Allen and Vanderschuren (2016) shows that about 80% of women reported having been harassed in public transport in a survey taken across developed and developing countries. Women's travels are also fraught with gender-based violence risks along the way – including on the walk to and from stops, while waiting at bus stops and transport hubs (e.g., bus/train stations or terminals), while boarding and alighting, and during rides. For example, women's exposure to both petty and violent crime is worsened by the long wait times at bus stops, taxi ranks and train stations, together with travelling during hours of darkness and overcrowded peak services (Srinivasan, 2005; Harrisberg, 2020).

In South Africa, a 2015 survey of women under 40 years showed that sexual harassment in public spaces such as streets and transport is quite pervasive (Livingston, Grillo, & Paluch, 2015), with high proportions of women reporting incidents ranging from verbal and non-verbal harassment to groping/fondling on public transit, as well as in public transit stations and on streets. In the Western Cape and Gauteng, between 80 – 90% of women reported feeling at risk of sexual harassment on crowded trains, buses, and minibus-taxis, while 56% of women witnessed and/or experienced violence while using public transport (City of Cape Town, 2018; Sonke Gender Justice, 2018; Mabaso, 2019). Based on a survey done by ActionAid in 2017, the Sowetan Live[5] reported that 69% of women who used public taxis and taxi ranks had witnessed violence and harassment, while 56% had experi-

[5]Available at https://www.sowetanlive.co.za/news/2017-03-24-fifty-six-percent-of-women-have-experienced-violence-on-taxis-survey/

enced violence while using public transport. According to Moghayedi et al. (2023), 80% of South African women were afraid of being harassed in public spaces, and most household heads consider the public transport journey too risky for females. The 2020 South African National Household Travel Survey (SANHTS)[6] also indicates that security is a primary concern for female travellers, while Moghayedi et al. (2023) found that in South Africa, the gender violence rate is higher in buses as compared with trains and minibuses. Moreover, the dynamics of intersectionality also come into play when we include race and/or disability. For example, black women commuters from historically disadvantaged areas who have no access to private transport bear the brunt of unreliable and unsafe modes of transport, such as taxis, buses, and trains.

Parvez Butt and Sekaram (2019) argue that despite important legislative and policy advances in most countries, sexual harassment on public transport is widely underreported, and suffers from both bystander and duty bearer inaction. Evidence by Allen and Vanderschuren (2016) shows that close to 80% of women across developing and developed countries reported having been harassed in the survey, yet most of these incidents were rarely reported to the authorities. While it is acknowledged that women and men have distinct expectations, requirements, and limitations when it comes to accessing and utilising public transportation, it appears that transport infrastructure and policies do not account for these gender-specific factors. In South Africa, gender considerations are rarely considered in transport planning and project development (Mabaso, 2019). Consequently, the resulting transportation systems fail to accommodate the distinct demands influenced by gender, often resulting in safety concerns.

Empirical evidence also shows that social norms can have demonstrable impacts on actions or behaviours in general (Cialdini, Reno, & Kallgren, 1990), and within transportation specifically (Alzahrani, Hall-Phillips, & Zeng, 2019; Barth, Jugert, & Fritsche, 2016; Simsekoglu & Nayum, 2019; Thøgersen & Ebsen, 2019). Some authors argue that social norms could offer an effective channel for controlling negative behaviours in public services such as public transport (Sterner & Sheng, 2013; Ostrom, 2000), while other studies have incorporated various types of social norms for policy acceptance behaviours. For example, (Hopkins, García Bengoechea, & Mandic, 2021; Keizer, Sargisson, van Zomeren,

[6]Available at: https://www.statssa.gov.za/publications/P0320/P03202020.pdf

& Steg, 2019; Jakovcevic & Steg, 2013) suggest that social norms enhance the acceptance of policies, including travel demand management policies and transport pricing policies. However, little attention has been paid to understanding the relationship between social norms and VAWG in public transport.

Studies considering the role of social norms in explaining behaviour related to public transport have found that perceived norms of public transport use predicted people's own use of public transport (Zhang, Schmöcker, Fujii, & Yang, 2016); and that public transport users' reported (mis)behaviour was associated significantly with their perceptions of normative behaviour (Zhang et al., 2016). Campaigns such as the Transport for London's 2008 "Considerate Traveler Campaign" (see Moore (2010)), and Chicago Transit Authority's "Courtesy Campaign"[7] presented positive social norms of respect and tolerance to reduce anti-social behaviours on public transport, including eating/drinking on transport, loud talking/music, littering or blocking doors.

Related to positive social norms, an emerging body of behavioural change literature has pointed to the positive role that correcting erroneous beliefs about these norms can play in reducing undesirable behaviour. For example, Bursztyn, González, and Yanagizawa-Drott (2020) corrected mistaken beliefs about low acceptance of women working outside the home in Saudi Arabia. By informing men that acceptance for women working was higher than they had previously believed, researchers were able to increase husbands' support for their wives' working outside the home. In our context, for example, a man might be more inclined to harass a female public transport user if he believes that most other men would condone this behaviour. If, however, he learns that most men do not condone the behaviour, he might be more cautious about engaging in it. We contribute to this literature by investigating respondents' beliefs about other men and women's acceptance of various behaviours, as well as respondents' own acceptance of these behaviours. Where there are gaps in these reports of acceptability, there is an opportunity for policy makers to communicate the more positive social norms (for example through billboards or bumper stickers) to transport users. In this way, transport users contemplating inappropriate behaviours would be informed that these behaviours are less normative than they might previously have believed.

[7] Available at: https://www.transitchicago.com/courtesy/

3 Methodology

We conducted an online survey of 1000 public transport users in South Africa covering a range of questions. The data were gathered by survey provider TGM Research in April/May 2024. TGM Research is a research company with a panel of respondents that they invite to participate in research studies. To be eligible to participate in our survey, respondents had to report using bus, train (excluding Gautrain) or taxi as their main mode of transport. We targeted 1000 public transport users in order to have readable samples for the 2 main forms of public transport: bus and taxi. Although online sampling, particularly convenience sampling, poses some challenges such as sampling bias and therefore lack of representativeness due to the non-random nature of the sample, where lower income users with less access to digital platforms are underrepresented, this mode of non-random convenience sampling also offers a number of advantages, including anonymity (important in posing questions about beliefs about the acceptability of sexual harassment, for example) and the ability to reach a large sample of respondents in a timely and cost-effective way. This approach is therefore beneficial for exploratory analysis. A more representative sample would be needed to test policy recommendations coming from this study. The study received ethics approval from the University of Pretoria EMS Ethics committee: EMS 078/24.

3.1 Participants

To participate in the survey, respondents first answered a short screener, including questions about their main mode of transport. Respondents progressed to the main survey if they reported either buses, trains (excluding the premium-priced Gautrain[8]) or taxis as their main mode of transport. Respondents also had to report being a resident of South Africa, aged 18 or older and pass a basic attention check question.[9] By having TGM Research send the survey to even shares of male and female respondents, and tracking

[8] At the time when the research was conducted, the Gautrain pricing resulted in this service catering to a wealthier demographic than other public transport modes. Subsequently, means-tested price discounts for lower income commuters have been introduced.

[9] Many people enjoy watching or playing different sports, and most have a favourite. We would like to know about your favourite sport, but we also want to check that you read questions carefully. To show that you have read this question properly, please ignore the following question and simply choose tennis. What is your favourite sport?

respondent gender as the survey progressed, we targeted an approximately even split between male and female public transport users, in order to investigate gender differences. Some previous work, for example, Mabaso (2019) focused only on women as they were interested in their experiences with violence in public transport. We deviate from only including females as our interest is in understanding how social norms correlate with sexual harassment and violence, and how these norms manifest across genders.

3.2 Survey

The survey included demographic questions (such as gender, age, level of education, self-reported income level, employment status, number of kids); questions about respondents' transport use and experiences (including commuting patterns such as timing, routes, and frequency of riding in public transport); and questions about risk perceptions, and experiences and beliefs related to sexual harassment and violence. The full questionnaire is included with the study's supplementary materials.

3.3 Data

We start by considering the demographic profile of our respondents. Table 1 shows our sample of transport users, split by gender. Our sample included 493 males and 503 females. The table shows that the gender splits in our sample are close to the 2020 National Household Travel Survey (NHTS) report at the time of conducting the survey. For example, the proportion of females and males in the 2020 NHTS was 51.2% and 49%, whilst the proportion of females and males in our sample is 50.5% and 49.5%. Typical of online samples, our respondents skewed towards higher household incomes (64% reported incomes greater than R10,000 per month, that is, above the median income for South Africa).[10] Our sample also reports more education than the general South African population (54% reported having completed college or having a degree). We do, however, see a mix of ages, as well as employment statuses and presence or absence of children. Interestingly, older female transport users were more prevalent than older male users, and female users were

[10]The South African Income and Expenditure Survey 2022/23 (Statistics South Africa) indicates a median household income for 2023 of ZAR 95,770. Adjusting for inflation, this amounts to a monthly income of ZAR 8,330 (USD 1,123 at 2024 PPP or 7.42, based on IMF calculations).

also more likely to report having children than male users. Finally, female users were more likely than male users to hold a tertiary education qualification.

Table 1: Descriptive statistics by gender

Columns by: Gender	Male	Female	Total
N (%)	493 (49.5)	503 (50.5)	996 (100.0)
Age group, n (%)			
Young	215 (43.6)	272 (54.1)	487 (48.9)
Middle-aged	247 (50.1)	218 (43.3)	465 (46.7)
Older	31 (6.3)	13 (2.6)	44 (4.4)
Monthly Household income, n (%)			
Under ZAR 10,000	74 (15.0)	64 (12.7)	138 (13.9)
ZAR 5000-10,000	118 (23.9)	103 (20.5)	221 (22.2)
ZAR 10,000 or more	301 (61.1)	336 (66.8)	637 (64.0)
Has children, n (%)			
No	201 (40.8)	165 (32.8)	366 (36.7)
Yes	292 (59.2)	338 (67.2)	630 (63.3)
Completed college/degree, n (%)			
No	267 (54.2)	192 (38.2)	459 (46.1)
Yes	226 (45.8)	311 (61.8)	537 (53.9)
Employment Status, n (%)			
Not employed	106 (21.5)	92 (18.3)	198 (19.9)
Student	50 (10.1)	53 (10.5)	103 (10.3)
Part time employment	94 (19.1)	97 (19.3)	191 (19.2)
Full time employment	243 (49.3)	261 (51.9)	504 (50.6)

Age group is defined as: Young = 18 -30 years old; Middle-aged 31 -50 years old; Older = over 50 years old.

4 Results

We report our findings in three steps; first, by analysing the travel behaviour of the individuals in our sample; second, understanding the individuals' perceptions of risk when using public transport, and third by examining the role of social norms in contributing to types of behaviours in public transport. We conduct this analysis by gender as we are interested in understanding gender differences or similarities in these areas.

4.1 Travelling Behaviour

We start by looking at the main mode of transport that is used by most individuals in the sample. We observe in Table 2 that 83% of the respondents in our sample use taxis, 14% use buses, and only 3% use trains[11] as their main mode. The findings are in line with typical transport use in South Africa. According to the 2020 National Household Travel Survey (NHTS) report, a higher proportion of South African households (66%) use minibus taxi services daily compared to buses (12.3%) and commuter trains (3%) in 2020 (StatsSA, 2022). Taxis may be the preferred mode of transport because they are more accessible and flexible with more route options than trains and buses. Although illegal, taxis often stop anywhere along the routes to pick up and drop off commuters, unlike buses and trains which follow designated stops and scheduled routes. The 2020 NHTS report highlights that travel flexibility is one of the main factors that influence people's choice of public transport mode. As such, urban workers are more likely to use taxis as a preferred mode of transport to work in relation to trains and buses (StatsSA, 2022).

Table 2 also reveals no significant gender differences in mode choice and commuting frequency.[12] A higher share of both men and women choose taxis (about 80%), followed by buses, and lastly taxis (about 3%). These findings are in line with some of the empirical evidence in South Africa, for example, Vanderschuren, Phayane, and Gwynne-Evans (2019)

[11] Various factors have contributed to the low use of trains, including infrastructure collapse due to poor maintenance, vandalism, and theft; corruption and governance failures at PRASA; unreliable service; and rising safety concerns—particularly over the past 10 to 15 years (Onderwater, 2021)

[12] Commuting frequency is calculated using the variable "frequency of use", which measures how often an individual commutes in a month (i.e. days per month that they commute). We coded "frequency of use" as; Daily= 30 days per month; Monthly=1 day per month; Rarely=0.5 a day per month; Several times a month=3 days per month; Several times a week=12 days per month; Weekly =4 days per month, such that the reported values indicate average commuting times per month.

concluded that the modal share between females and males did not differ substantially, while Mabaso (2019) found that most people in Gauteng and Western Cape provinces use public transport at least five days in a week. We also did not find significant gender differences in the time spent travelling. The majority of the respondents in the sample spend between 15 to 60 minutes commuting. These results are in line with the 2020 NHTS report, where 96.9% of train users, 60.8% of bus commuters and 78.6% of taxi commuters in 2020 spent at least 30 minutes to more than an hour to reach their place of work. These findings show that commuters can spend between 30 minutes and more than an hour travelling to work, depending on the mode of transport, with taxis having shorter travel times than trains and buses (StatsSA, 2022).[13]

Table 2: Mode of transport and commuting frequency by gender

Columns by: Gender	Male	Female	Total	P-value
N (%)	493 (49.5)	503 (50.5)	996 (100.0)	
Main Mode, n (%)				
Bus	73 (14.8)	63 (12.5)	136 (13.7)	0.29
Taxi	402 (81.5)	425 (84.5)	827 (83.0)	0.21
Train	18 (3.7)	15 (3.0)	33 (3.3)	0.56
Commuting frequency, mean (sd)	18.197 (11.176)	18.229 (11.351)	18.213 (11.259)	0.96

Notes: The table shows the distribution of transportation alternatives by gender and in total.

Table 3 presents the gender-specific percentages and associated standard errors for different commuting purposes. Most of the individuals in our sample indicated that they commute primarily for work and running errands. Across all categories, standard errors are relatively small, indicating stable estimates. However, even small differences between male and female respondents, for example, in shopping or work commutes, do not translate into statistical significance, as reflected in the p-values. This suggests that observed gender differences in commuting purposes are modest and not driven by substantial underlying variation.[14]

[13]See Table 20 in Appendix A on time spent commuting. We do not find any statistical differences between genders.

[14]We also ran a two-sample proportion test results for gender differences in citing "work commute" as the purpose of commuting among employed respondents. Our findings show that there is no statistically significant difference between males and females in the likelihood of selecting "work commute" as the purpose of commuting among employed individuals. Although the proportion is slightly higher for females (73.7%) compared to males (71.3%), the p-value (0.456) is far above the conventional threshold of 0.05, indicating that this difference could be due to random variation. The results are available on request.

Table 3: Purpose of commuting

	Male	Female	Total	
Total number of commuters n (%)	493 (49.5)	503 (50.5)	996 (100.0)	
Purpose of Commute	**Male % (SE)**	**Female % (SE)**	**Total %**	**P-value**
Childcare (e.g., school run)	2.6 (0.0072)	1.6 (0.0058)	2.1	0.25
Medical Appointments	1.4 (0.0053)	1.2 (0.0048)	1.3	0.75
School/University Commute	9.7 (0.0137)	9.5 (0.0131)	9.6	0.92
Shopping/Errands	19.5 (0.0179)	21.1 (0.0182)	20.3	0.53
Social/Recreational Activities	2.6 (0.0072)	2.0 (0.0062)	2.3	0.50
Tourism/Leisure	0.8 (0.0044)	1.2 (0.0058)	1.0	0.55
Visiting Family/Friends	6.1 (0.0108)	6.8 (0.0112)	6.4	0.66
Work Commute	57.2 (0.0223)	56.7 (0.0221)	56.9	0.86

Table 4 shows a significant association between transport mode and commute purpose as highlighted by the Pearson chi-square (χ^2) of 55.49 and p-value of 0.000, indicating that trip purposes vary across modes. For example, out of the 996 respondents, 567 (just over 50%) commute for work purposes, while 202 (20%) respondents commute for shopping or errands and 96 (about 10% of all respondents) commute for school-related travel. Within the group of 567 respondents who commute for work purposes, the majority (451 or about 80%) use taxis to get to work, with about 17% using buses and 3% using trains. Within the group of 202 respondents who use public transport for running errands, again the majority use taxis (about 97%), with only 2% using buses and 1% using trains. These findings reveal that taxis are predominantly used for most purposes, particularly work, shopping and school, reflecting their flexibility and accessibility. Buses are more commonly associated with work and school commutes, while train users are concentrated in work-related travel.

Table 4: Purpose of commuting by main mode

Purpose of Commute	**Bus n (%)**	**Taxi n (%)**	**Train n (%)**	**Total n (%)**
Childcare (e.g., school run)	3 (14.29)	18 (85.71)	0 (0.00)	21 (2.11)
Medical Appointments	1 (7.69)	11 (84.62)	1 (7.69)	13 (1.31)
School/University Commute	19 (19.79)	74 (77.08)	3 (3.12)	96 (9.64)
Shopping/Errands	5 (2.48)	195 (96.53)	2 (0.99)	202 (20.28)
Social/Recreational Activities	3 (13.04)	17 (73.91)	3 (13.04)	23 (2.31)
Tourism/Leisure	1 (10.00)	7 (70.00)	2 (20.00)	10 (1.00)
Visiting Family/Friends	6 (9.38)	54 (84.38)	4 (6.25)	64 (6.43)
Work Commute	98 (17.28)	451 (79.54)	18 (3.17)	567 (56.93)
Total	136 (13.65)	827 (83.03)	33 (3.31)	996 (100.0)

Pearson chi-square (χ^2) = 55.49 Prob = 0.0000

The analysis also examined how commuter purposes differ by the main mode of public transport across age groups. The results reveal notable age-based differences in transport use patterns. Among young respondents in Table 5, the distribution of commuting pur-

poses varies significantly by mode of transport with a Pearson chi-square (χ^2) of 36.21 and a p-value of 0.0033. Of the 487 respondents, work (231), school (89) and errand (113) commutes are the most common purposes. Among the 231 respondents who commute to work, we find that most are concentrated among taxi users (78%), followed by bus users (19%). Among the group of 89 that use public transport to commute to school, 79% use taxis, while 19% and 2% use buses and trains respectively. Shopping and errands are also common among taxi users (96%), but very low among bus users (2.7%) and train users (0.9%). These patterns suggest that among the young respondents, taxis are widely used for work, school and shopping, while buses are more focused on work and school purposes. Train usage is minimal across all purposes in this age group.

Table 5: Purpose of commuting by main mode among young respondents

Purpose of Commute	**Bus n (%)**	**Taxi n (%)**	**Train n (%)**	**Total n (%)**
Childcare (e.g., school run)	0 (0.00)	5 (100.00)	0 (0.00)	5 (1.03)
Medical Appointments	1 (25.00)	3 (75.00)	0 (0.00)	4 (0.82)
School/University Commute	17 (19.10)	70 (78.65)	2 (2.25)	89 (18.28)
Shopping/Errands	3 (2.65)	109 (96.46)	1 (0.88)	113 (23.20)
Social/Recreational Activities	2 (25.00)	6 (75.00)	0 (0.00)	8 (1.64)
Tourism/Leisure	1 (20.00)	3 (60.00)	1 (20.00)	5 (1.03)
Visiting Family/Friends	1 (3.12)	30 (93.75)	1 (3.12)	32 (6.57)
Work Commute	43 (18.61)	181 (78.35)	7 (3.03)	231 (47.43)
Total	68 (13.96)	407 (83.57)	12 (2.46)	487 (100.00)

Pearson chi-square (χ^2) = 32.61, Prob = 0.0033

Among the middle-aged group in Table 6, the distribution of commuting purposes varies significantly by mode of transport with a Pearson chi-square (χ^2) of 36.59 and a p-value of 0.000) among middle-aged respondents. Within this age group of 465 respondents, work, running errands, and childcare are the common purposes of commuting. Among the 312 respondents who use public transport for work purposes, about 81% use taxis as main mode of transport, while 16% and 9% use buses and trains respectively. Similar share distribution is evident for childcare, with 80% of the 15 respondents using taxis in relation to buses and trains. These travel patterns reveal that among the middle-aged respondents, taxis are again the commonly used mode of transport across the various commuting purposes. Buses are used mainly for work commutes, with very limited use for other purposes. Train use is minimal and spread thinly across work and other purposes, with virtually no use for medical or childcare purposes.

Among older respondents, as shown in Table 7, no significant association was found

Table 6: Purpose of commuting by main mode among middle-aged respondents

Purpose of Commute	Bus n (%)	Taxi n (%)	Train n (%)	Total n (%)
Childcare (e.g., school run)	3 (20.00)	12 (80.00)	0 (0.00)	15 (3.23)
Medical Appointments	0 (0.00)	7 (100.00)	0 (0.00)	7 (1.51)
School/University Commute	2 (28.57)	4 (57.14)	1 (14.29)	7 (1.51)
Shopping/Errands	0 (0.00)	76 (98.70)	1 (1.30)	77 (16.56)
Social/Recreational Activities	1 (8.33)	9 (75.00)	2 (16.67)	12 (2.58)
Tourism/Leisure	0 (0.00)	4 (80.00)	1 (20.00)	5 (1.08)
Visiting Family/Friends	1 (16.67)	4 (73.33)	1 (10.00)	6 (1.29)
Work Commute	49 (15.71)	254 (81.41)	9 (2.88)	312 (67.10)
Total	60 (12.90)	388 (83.44)	17 (3.66)	465 (100.00)

Pearson chi-square (χ^2) = 36.59, Prob = 0.0009

between transport mode and commuting purpose as indicated by the Pearson chi-square (χ^2) of 9.85 and p-value of 0.453, suggesting that buses, taxis, and trains are used relatively interchangeably between travel types.

Table 7: Purpose of commuting by main mode among older respondents

Purpose of Commute	Bus n (%)	Taxi n (%)	Train n (%)	Total n (%)
Childcare (e.g., school run)	0 (0.00)	1 (100.00)	0 (0.00)	1 (4.55)
Medical Appointments	0 (0.00)	1 (50.00)	1 (50.00)	2 (9.09)
Shopping/Errands	2 (16.67)	10 (83.33)	0 (0.00)	12 (27.27)
Social/Recreational Activities	0 (0.00)	2 (66.67)	1 (33.33)	3 (6.82)
Visiting Family/Friends	0 (0.00)	1 (100.00)	0 (0.00)	1 (4.55)
Work Commute	6 (25.00)	16 (66.67)	2 (8.33)	24 (54.55)
Total	8 (18.18)	31 (70.45)	4 (9.09)	44 (100.00)

Pearson chi-square (χ^2) = 9.85, Prob = 0.4534

In all these age groups, taxis are the dominant mode of transportation for work, school, shopping, and childcare, especially among the young and middle-aged groups. Buses were used primarily for work and school commutes, with minimal use for other activities, while the use of trains was limited in all age groups and dispersed across various purposes. These findings highlight the differentiated role of transport modes in meeting commuting needs as individuals age, with taxis serving as a flexible option and trains playing a marginal role in daily travel.

However, when respondents were asked for reasons why they do not use alternative modes of transport to their regular one, we find statistically significant differences between men and women, particularly for those who do not use trains. Table 8 shows that the most common reason for not using trains or buses is that they are not close to the respondents' home or work. This reason is reported more frequently by women than men for both of these modes of transport. Longer trips are another common reason why people report not

using buses or trains, with slightly higher reports of this reason among men. Although only mentioned by 7% of non-train users, women also prefer not to use trains due to the risk of sexual harassment. These findings support evidence by Mabaso (2019) that highlights that trains in South Africa are considered unsafe, are often overcrowded, are not punctual, and the stations are not located near homes or work.

In addition, the 2020 NHTS report indicates that the reasons people choose not to use certain modes of public transport are mainly because the service is not available in their area, they are unhappy with the security in all modes of transport, dissatisfied with the facilities at the taxi ranks and bus stations, the taxi fares are too high, dissatisfied with the level of crowding in buses and trains, dissatisfied with the frequency of buses and trains and the waiting time for taxis and trains (StatsSA, 2022). These reasons may be useful for city planners in addressing such challenges by making more public transport services available in areas where the frequency of services is low and by creating a more conducive environment for using public transport, especially for women who believe they are more at risk of sexual harassment. Mobility hindrance can affect the ability of women to access economic resources, such as education, jobs, or healthcare services (Yasir, Ahmad, & Enam, 2022). It is worth noting that the non-taxi users in our sample are a very small group, such that we cannot infer too much about non-taxi users' reasons for avoiding this mode of transport.

Table 8: Reasons commuters do not use mode

Columns by: Gender	Male	Female	Total	P-value
Non-train users, n (%)	475 (49.3)	488 (50.7)	963 (100.0)	
It is not close to my home or work, n (%)	203 (53.4)	265 (63.9)	468 (58.9)	0.00
It is not reliable, n (%)	41 (10.8)	17 (4.1)	58 (7.3)	0.00
It is too expensive, n (%)	2 (0.5)	10 (2.4)	12 (1.5)	0.03
My journey takes too long with this mode of transport, n (%)	43 (11.3)	16 (3.9)	59 (7.4)	0.00
Risk of accidents, n (%)	1 (0.3)	6 (1.4)	7 (0.9)	0.07
Risk of other violence (non-sexual), n (%)	10 (2.6)	6 (1.4)	16 (2.0)	0.23
Risk of sexual harassment, n (%)	6 (1.6)	28 (6.7)	34 (4.3)	0.00
Risk of sexual violence, n (%)	1 (0.3)	0 (0.0)	1 (0.1)	0.30
Risk of theft, n (%)	31 (8.2)	31 (7.5)	62 (7.8)	0.72
Non-bus users n (%)	420 (48.8)	440 (51.2)	860 (100.0)	
It is not close to my home or work, n (%)	86 (35.5)	118 (42.8)	204 (39.4)	0.09
It is not reliable, n (%)	29 (12.0)	26 (9.4)	55 (10.6)	0.34
It is too expensive, n (%)	9 (3.7)	6 (2.2)	15 (2.9)	0.30
My journey takes too long with this mode of transport, n (%)	89 (36.8)	84 (30.4)	173 (33.4)	0.13
Risk of accidents, n (%)	3 (1.2)	14 (5.1)	17 (3.3)	0.01
Risk of other violence (non-sexual), n (%)	1 (0.4)	2 (0.7)	3 (0.6)	0.64
Risk of sexual harassment, n (%)	4 (1.7)	3 (1.1)	7 (1.4)	0.58
Risk of sexual violence, n (%)	1 (0.4)	0 (0.0)	1 (0.2)	0.29
Risk of theft, n (%)	5 (2.1)	6 (2.2)	11 (2.1)	0.93
Non-taxi users n (%)	91 (53.8)	78 (46.2)	169 (100.0)	
It is not close to my home or work, n (%)	2 (6.2)	3 (9.7)	5 (7.9)	0.61
It is not reliable, n (%)	7 (21.9)	5 (16.1)	12 (19.0)	0.56
It is too expensive, n (%)	5 (15.6)	3 (9.7)	8 (12.7)	0.48
My journey takes too long with this mode of transport, n (%)	3 (9.4)	2 (6.5)	5 (7.9)	0.67
Risk of accidents, n (%)	6 (18.8)	7 (22.6)	13 (20.6)	0.71
Risk of other violence (non-sexual), n (%)	3 (9.4)	4 (12.9)	7 (11.1)	0.66
Risk of sexual harassment, n (%)	3 (9.4)	2 (6.5)	5 (7.9)	0.67
Risk of theft, n (%)	0 (0.0)	2 (6.5)	2 (3.2)	0.14

Notes: Table 8 presents gender-disaggregated reasons why respondents do not use specific public transport modes—trains, buses, and taxis.

In terms of commuting times, Table 9 shows the gendered patterns in commuting times. The results indicate different patterns, particularly during early morning and morning peak hours. Male commuters are more likely than women to commute before 6am, while women are more likely to commute between 7am and 9am. This result may be related to women having more concerns about travel safety in the very early hours of the morning. It might also be linked to women's non-linear travel behaviour where they combine tasks such as school runs and shopping on their way to and from work, whereas men tend to have linear travel patterns of going to and from work directly (Dominguez Gonzalez et al., 2020; Janusz, Kesteloot, Vermeiren, & Van Rompaey, 2019). While we do find evidence of trip-chaining in our sample of respondents in terms of more women using more than one taxi, the differences between gender are not statistically significant.[15]

Respondents were also asked to provide reasons if they had changed from a previous mode of transport to the current one in the last year. These reasons are shown in Table

[15]See Table 19 in Appendix A on trip-chaining. We do not find any statistical differences between genders.

Table 9: Commuting times by gender

Columns by: Gender	Male	Female	Total	P-value
Number of commuters n (%)	493 (49.5)	503 (50.5)	996 (100.0)	
Early morning commute: (4:00am - 6:00am), n (%)	167 (33.9)	112 (22.3)	279 (28.0)	0.00
Morning peak commute: (7:00am - 9:00am), n (%)	237 (48.1)	283 (56.3)	520 (52.2)	0.01
Afternoon peak commute: (4:00pm - 7:00pm), n (%)	199 (40.4)	215 (42.7)	414 (41.6)	0.45
Evening commute (7:00pm - 10:00pm), n (%)	37 (7.5)	38 (7.6)	75 (7.5)	0.98
Late night commute: (10:00pm - 4:00am), n (%)	6 (1.2)	4 (0.8)	10 (1.0)	0.50

10. These reasons could differ across modes of transport, therefore we only report the ones that were applicable to the different modes of transport. We do not find any gender differences in Table 10 except for current taxi users who cited changing jobs or moving to an area with different transport modes. Among current bus users, some cited not being able to afford the previous mode of transport anymore due to less income. But the number of current bus users who changed modes of transport in the last year is relatively small so we interpret these statistics with some caution. The main purpose for asking this question was to determine if the decision to change modes of public transport was made voluntarily or under duress, such as witnessing or experiencing sexual harassment. Such evidence could be used to inform policies related to improving the coverage, reliability and safety of public transport.

Table 10: Reasons current mode users changed from previous mode in the last year

Columns by: Gender	Male	Female	Total	P-value
Current train users n (%)	12 (57.1)	9 (42.9)	21 (100.0)	
I experienced, witnessed, or heard about SH in old mode, n (%)	2 (16.7)	0 (0.0)	2 (9.5)	0.20
I have more money now so I can afford a better mode of transport, n (%)	1 (8.3)	0 (0.0)	1 (4.8)	0.37
New mode of transport has better security measures, n (%)	1 (8.3)	1 (11.1)	2 (9.5)	0.83
New mode of transport is cheaper, n (%)	6 (50.0)	5 (55.6)	11 (52.4)	0.80
New mode has a more convenient schedule or route , n (%)	1 (8.3)	3 (33.3)	4 (19.0)	0.15
Current bus users n (%)	31 (64.6)	17 (35.4)	48 (100.0)	
I experienced, witnessed, or heard about SH in old mode, n (%)	9 (29.0)	2 (11.8)	11 (22.9)	0.17
I changed jobs or moved to an area with different transport modes, n (%)	2 (6.5)	1 (5.9)	3 (6.3)	0.94
Less money now so I cannot afford my old mode of transport, n (%)	1 (3.2)	4 (23.5)	5 (10.4)	0.03
More money now so I can afford a better mode of transport, n (%)	1 (3.2)	1 (5.9)	2 (4.2)	0.66
New mode of transport has better security measures, n (%)	5 (16.1)	2 (11.8)	7 (14.6)	0.68
Current taxi users n (%)	91 (47.2)	102 (52.8)	193 (100.0)	
I experienced, witnessed, or heard about SH in old mode, n (%)	8 (8.8)	13 (12.7)	21 (10.9)	0.38
I changed jobs or moved to an area with different transport modes, n (%)	19 (20.9)	11 (10.8)	30 (15.5)	0.05
Less money now so I cannot afford my old mode of transport, n (%)	4 (4.4)	11 (10.8)	15 (7.8)	0.10
More money now so I can afford a better mode of transport, n (%)	4 (4.4)	1 (1.0)	5 (2.6)	0.14
New mode of transport has better security measures, n (%)	15 (16.5)	14 (13.7)	29 (15.0)	0.59

Following from Table 10, we asked respondents if they had turned down a job due

to public transport issues and their reasons. Table 11 reports the reasons for only those individuals who stated that they previously turned down a job because of transport issues. We observe some differences between men and women. A relatively higher proportion of women indicated that they declined the job because the mode of transport did not go to their workplace or because of bad past experiences with public transport. Inadequate public transport during the necessary working hours, and fear of being harassed while traveling were also noted. Men cited transportation costs and safety/reliability of transport somewhat more frequently than women did, as their reasons for turning down a job. These gender differences are important as they highlight that for women, poor coverage of public transport and lack of safety from harassment can act as major barriers to accessing transport and economic opportunities (Borker, 2024; Yasir et al., 2022). These findings are in line with Porter et al. (2017) and Foley et al. (2022) who find evidence that women in Africa perceive themselves as vulnerable to violence when using public transport. Moreover, Mabaso (2019) provides extensive evidence on the pervasiveness of violence and sexual harassment towards women in public transport across Gauteng and Western Cape provinces.

Table 11: Reason respondent declined job

Columns by: Gender	Male	Female	Total	P-value
Responded declined job because: job n (%)	199 (49.0)	207 (51.0)	406 (100.0)	
I had bad experiences with commuting in public transport before, so I avoid it, n (%)	1 (0.5)	8 (3.9)	9 (2.2)	0.02
I was scared of being harassed or attacked while traveling to and from work, n (%)	23 (11.6)	25 (12.1)	48 (11.8)	0.87
Lack of adequate transportation during the necessary working hours, n (%)	24 (12.1)	30 (14.5)	54 (13.3)	0.47
Other (specify), n (%)	3 (1.5)	1 (0.5)	4 (1.0)	0.30
The available transportation modes did not get where I was supposed to work, n (%)	47 (23.6)	61 (29.5)	108 (26.6)	0.18
The transport options were not safe or reliable (e.g., bad driving or bad conditions of vehicles), n (%)	31 (15.6)	17 (8.2)	48 (11.8)	0.02
Transportation costs to get to work were high. (1), n (%)	70 (35.2)	65 (31.4)	135 (33.3)	0.42

4.2 Safety risks and reporting in public transport

We consider respondents' perceptions of the safety of their regular mode of transport. Perceptions are a powerful mechanism that can drive behaviour and choices. Regarding safety in public transport, a number of studies indicate even in the absence of any specific incident, perceptions of safety can lead women to certain public transport environments and to adjusting their travel behaviour to avoid those environments (Loukaitou-Sideris, 2014; Marques, 2022; Tilleman & Chowdhury, 2024). In Table 12, respondents were asked to rank the 3 main modes of public transport based on safety from theft and safety from sexual harassment. Safety rankings for theft and sexual harassment were based on separate questions and restricted to regular users of each mode. While some regular users considered their main mode the safest for both concerns, others made distinctions. As such, the number of respondents may not necessarily sum to the total male or female regular users by mode, as some may have indicated that the bus is safest for both theft and sexual harassment, while some may have indicated one or neither.

From Table 12, regular bus users are generally more likely than regular taxi or train users to perceive their chosen mode as the safest both in terms of theft (61.7%) and sexual harassment (57.9%). These proportions are consistently higher than those for regular taxi users (56.1% and 50.3%) and regular train users (40.9% and 36.4%). When disaggregated by gender, female bus users are notably more likely to rate the bus as safest from sexual harassment (66.7% vs. 50.8%), while among taxi users, women rate taxis as safest from theft (58.2% vs. 54%). Overall, buses are most commonly viewed as the safest mode particularly among women, while trains are perceived least favourably on both safety dimensions across genders.

These safety perceptions may help explain why some users choose a particular mode as their regular form of transport. However, not all regular users consistently rank their own mode as safest for both concerns. For example, from our sample, 38% of regular users ranked their main mode as safest for both theft and sexual harassment, while others identified it as safest for only one or neither, suggesting that some make nuanced distinctions depending on the type of safety risk.

Table 12: Regular commuters' ranking mode for safety

Columns by: Gender	Male	Female	Total	P-value
Regular bus users n (%)	59 (55.1)	48 (44.9)	107 (100.0)	
Bus is safest (theft) (Yes), n (%)	36 (61.0)	30 (62.5)	66 (61.7)	0.88
Bus is safest (SH) (Yes), n (%)	30 (50.8)	32 (66.7)	62 (57.9)	0.10
Regular taxi users n (%)	324 (49.5)	330 (50.5)	654 (100.0)	
Taxi is safest (theft) (Yes), n (%)	175 (54.0)	192 (58.2)	367 (56.1)	0.28
Taxi is safest (SH) (Yes), n (%)	162 (50.0)	167 (50.6)	329 (50.3)	0.88
Regular train users n (%)	11 (50.0)	11 (50.0)	22 (100.0)	
Train is safest (theft) (Yes), n (%)	5 (45.5)	4 (36.4)	9 (40.9)	0.66
Train is safest (SH) (Yes), n (%)	3 (27.3)	5 (45.5)	8 (36.4)	0.38

Notes: Regular users are defined as those who use the mode daily or several times a week and were assigned that mode as their main mode of transport. This is in comparison to those who use the same modes less frequently, for example, once a week, monthly or rarely at all.

4.2.1 Safety along commute

Respondents were asked about their feelings of safety at different points in the commute (traveling, walking to/from transport, and waiting for transport). This was asked on a scale ranging from never (0) to always (10). Table 13 reports mean safety perception scores by gender. The p-values are calculated using two sample t-tests with unequal variances (Welch's t-tests), appropriate for comparing group means when the assumption of equal variances may not hold.[16] Overall, women report feeling less safe than men across all indicators. This pattern holds during both daytime and nighttime travel, as well as when walking to or waiting at transit points. The differences are particularly pronounced at night and at transit points, where women's average safety scores are substantially lower.

[16]While the p-values indicate statistically significant differences between men and women at all points along the commute, it is important to note that these differences, though statistically significant, are often small in magnitude. This is due to the sample size, which increases the sensitivity of the test to even modest differences in group means. Therefore, we caution against over-interpreting statistical significance in isolation. Throughout the paper, we emphasize not only the statistical results but also the substantive importance of observed differences, especially where gendered experiences may influence transport choices and perceptions.

Table 13: Feelings of safety during commute

Columns by: Gender	Male	Female	Total	P-value
n (%)	493 (49.5)	503 (50.5)	996 (100.0)	
Feel safe travelling in mode during the day, mean (sd)	7.02 (2.44)	6.76 (2.38)	6.89 (2.41)	0.09
Feel safe travelling in mode during the night, mean (sd)	4.30 (2.93)	3.07 (2.88)	3.68 (2.97)	0.00
Feel safe walking to transit point during the day, mean (sd)	7.09 (2.77)	6.56 (2.76)	6.82 (2.78)	0.00
Feel safe walking to transit point during the night, mean (sd)	3.01 (2.85)	1.65 (2.55)	2.32 (2.79)	0.00
Feel safe waiting for mode at transit point during the day, mean (sd)	6.96 (2.91)	6.28 (2.73)	6.62 (2.84)	0.00
Feel safe waiting for mode at transit point during the night, mean (sd)	2.98 (2.92)	1.67 (2.64)	2.32 (2.86)	0.00

4.2.2 Experienced or witnessed acts of violence

We asked respondents about whether they had witnessed different types of safety-related incidents in their main mode of transport. Table 14 presents this data by transport mode. Concerningly, the majority of respondents reported witnessing at least one of the incidents specified in the survey. Taxi users report more verbal harassment and threats than users of buses or trains. It is also interesting to note that women are more likely than men to report having witnessed physical harassment or stalking on buses. Women are also more likely than men to report having witnessed threats on buses. This gender difference might be due to women being victimised more often in this way, but might also be related to heightened concern about such risks (and therefore more attention being paid to such incidents) among women. Sexual assault and stalking are reported more on trains than on buses or taxis, although it should again be remembered that our train user sample is very small, and therefore likely not representative.

We also asked respondents whether they feel safer with male or female security personnel; and whether they would prefer to report any incidents to a male or female personnel member. Our "Safer with female security personnel" is coded as 1 if the respondent reported feeling safer with female personnel, and 0 otherwise. Similarly, "Prefer to report incidents to a female" takes the value of 1 if respondents note that in the event of a safety incident, they would be more comfortable reporting this to female security personnel; and 0 otherwise. We note that women are far more likely than men to report feeling safer with female security personnel, and that more than 60% of women would prefer to report an incident to a female (this number is only 28% for men). Women are also more likely than

men to report feeling safer with female security personnel, with the proportion of women reporting feeling more safe with female security personnel being highest on taxis.

Table 14: Commuters who experienced or witnessed acts of violence in mode

Columns by: Gender	Male	Female	Total	P-value
Regular bus users n (%)	59 (55.1)	48 (44.9)	107 (100.0)	
Witnessed verbal harassment (Yes), n (%)	43 (72.9)	34 (70.8)	77 (72.0)	0.81
Witnessed physical harassment (Yes), n (%)	14 (23.7)	11 (22.9)	25 (23.4)	0.92
Witnessed stalking (Yes), n (%)	15 (25.4)	12 (25.0)	27 (25.2)	0.96
Witnessed threats (Yes), n (%)	15 (25.4)	20 (41.7)	35 (32.7)	0.07
Witnessed sexual assault (Yes), n (%)	3 (5.1)	4 (8.3)	7 (6.5)	0.50
Safer with female security personnel (Yes), n (%)	5 (8.5)	7 (14.6)	12 (11.2)	0.32
Prefer to report incidents to a female (Yes), n (%)	14 (23.7)	25 (52.1)	39 (36.4)	0.00
Regular taxi users n (%)	324 (49.5)	330 (50.5)	654 (100.0)	
Witnessed verbal harassment (Yes), n (%)	263 (81.2)	270 (81.8)	533 (81.5)	0.83
Witnessed physical harassment (Yes), n (%)	86 (26.5)	112 (33.9)	198 (30.3)	0.04
Witnessed stalking (Yes), n (%)	58 (17.9)	91 (27.6)	149 (22.8)	0.00
Witnessed threats (Yes), n (%)	157 (48.5)	175 (53.0)	332 (50.8)	0.24
Witnessed sexual assault (Yes), n (%)	29 (9.0)	40 (12.1)	69 (10.6)	0.19
Safer with female security personnel (Yes), n (%)	23 (7.1)	137 (41.5)	160 (24.5)	0.00
Prefer to report incidents to a female (Yes), n (%)	98 (30.2)	206 (62.4)	304 (46.5)	0.00
Regular train users n (%)	11 (50.0)	11 (50.0)	22 (100.0)	
Witnessed verbal harassment (Yes), n (%)	8 (72.7)	6 (54.5)	14 (63.6)	0.38
Witnessed physical harassment (Yes), n (%)	5 (45.5)	4 (36.4)	9 (40.9)	0.66
Witnessed stalking (Yes), n (%)	5 (45.5)	5 (45.5)	10 (45.5)	1.00
Witnessed threats (Yes), n (%)	5 (45.5)	4 (36.4)	9 (40.9)	0.66
Witnessed sexual assault (Yes), n (%)	2 (18.2)	2 (18.2)	4 (18.2)	1.00
Safer with female security personnel (Yes), n (%)	1 (9.1)	2 (18.2)	3 (13.6)	0.53
Prefer to report incidents to a female (Yes), n (%)	3 (27.3)	7 (63.6)	10 (45.5)	0.09

4.3 Bystanders Effect

We also analysed the extent to which people who witness harassment (i.e., bystanders) choose to report these incidents. Our reason for investigating this issue is rooted in the fact that although sexual harassment and violence on public transport have become widely recognised challenges, less attention has been given to the role of bystanders in these situations. This is particularly important given that women generally perceive public transport as more secure when others are present as potential active bystanders (Tilleman & Chowdhury, 2024). Bystanders are third-party witnesses to situations or events. Bystander behaviour can be proactive (i.e., promoting social norms that do not accept violence and sexist behaviour) and reactive (i.e., intervening, reporting). Despite the limited research on bystander intervention in the public transport setting; available empirical evidence suggests that bystander intervention can be an effective strategy for reducing incidents of harassment (Coker et al., 2011; Gidycz, Orchowski, & Berkowitz, 2011; Roberts & Marsh, 2020).

The data presented in Table 15 shows perspectives on beliefs about intervention. Both men and women frequently witness harassment in public spaces; 49.1% of men and 50.9% of women, respectively. This underscores the pervasive nature of harassment, affecting both genders in shared public environments. Furthermore, 86.6% of respondents agreed that bystanders should intervene, reflecting a strong societal expectation for collective action against harassment. This nearly unanimous agreement that intervention is necessary speaks to the potential for cultivating a shared culture of responsibility with regards to public transport safety. According to Pennay and Powell (2012), such a culture can only thrive if individuals feel both empowered and supported to act.

Table 15: Beliefs about intervention

Columns by: Gender	Male	Female	Total
Witnessed harassment n (%)	417 (49.1)	433 (50.9)	850 (100.0)
Agree: bystanders should intervene, n (%)	353 (84.7)	383 (88.5)	736 (86.6)
Agree: they are morally obligated to intervene, n (%)	318 (76.3)	321 (74.1)	639 (75.2)

Table 15 also reveals that though women's support for bystander intervention (88.5%)

is somewhat higher than men's (84.7%), they show slightly less agreement (74.1%) than men (76.3%) regarding their own actual obligation to intervene. This may stem from women's heightened concern for safety and fear of retaliation, as they often face greater risks of harassment and violence when they intervene. This is supported by findings in Yule and Grych (2020), who states that the reason most women do not intervene when they see another woman being victimised is due to skills deficit (i.e. lack of knowledge on how to assist in such a situation). On the other hand, men expressed a slightly higher sense of moral obligation to intervene (76.3%), likely reflecting societal expectations of men as protectors. While this suggests that men recognise their role in promoting safer spaces, barriers such as bystander apathy and fear of escalation may still prevent action (Latane, 1970; Mabaso, 2019). Some men do not intervene due to lack of clear guidance or social reinforcement which often makes them hesitant in such situations (Banyard, Plante, & Moynihan, 2004), and others cite the lack of perceived responsibility among other reasons (Yule & Grych, 2020).

An important issue which has been cited as usually inhibiting bystander intervention is that these incidents often leave victims themselves often uncertain about how to react beyond "just shaking it off" (Ceccato, Näsman, & Langefors, 2021; Mellgren, Andersson, & Ivert, 2018). This uncertainty in response or reaction on the part of the victims in turn complicates the role of bystanders who witness these incidents but are unclear if it is appropriate for them to intervene when the victims have not made any reaction to the harassment (Tilleman & Chowdhury, 2024).

In Table 16, we look specifically at respondents who stated that they had witnessed harassment, and felt morally obligated to take action if they witness sexual violence or harassment; and believed that bystanders should intervene when witnessing such incidents on public transport [17], and their subsequent reporting behaviour, disaggregated by gender. From our data, there is evidence of underreporting of these incidences, even among people who self-reported as believing in the importance of bystander intervention. The majority (62.3%) did not report the incident, with females less likely to report (66.8%) compared

[17]Specifically, respondents were included in this analysis if they reported having witnessed sexual harassment on public transport, and agreed or strongly agreed with 2 statements: stated that they felt morally obligated (i.e., those who agree or strongly agree with statement) to take action (i.e., intervene, prevent or report) if they witness sexual violence or harassment against women and girls on public transport since it is against their values; and Bystanders should intervene when witnessing acts of sexual violence or harassment on public transport.

to males (57.7%).This underreporting is a major challenge in fully understanding the frequency, severity, and impact of harassment and gender-based violence on women and public transport ridership (Tilleman & Chowdhury, 2024).

Among those who did not report, the most cited reason was a belief that reporting would not lead to any meaningful change (37.2%), followed by a sense that it was the victim's responsibility to report (15.4%). Notably, fear of being victimised by the authorities was more commonly cited by female respondents (18.0%) than males (10.4%), and this difference was statistically significant ($p = 0.04$). This reflects a gendered trust gap in law enforcement and public safety institutions in line with the arguments in Bott, Morrison, and Ellsberg (2005) and Chant, Klett-Davies, and Ramalho (2017). They argue that in cities of the Global South, there is a tendency for justice and law enforcement officials to dismiss or overlook gender-based violence, which discourages victims from reporting these incidents. Our result is also in line with the finding by Quinones (2020) that in other countries such as Colombia, the general perception is that reporting is useless, as supported by accounts of women who tried to report an incident and faced several difficulties. Other reasons, including distrust of authorities, shame, and the perception that it was not their responsibility to report, did not differ significantly by gender.

Table 16: Bystander Effect: Reporting and Reasons for Non-Reporting among Witnesses of Sexual Harassment

Category	Male	Female	Total	P-value
Witnessed sexual harassment, n (%)	284 (49.1)	295 (50.9)	579 (100.0)	
Did you report the incident?, n (%)				
Didn't report	164 (57.7)	197 (66.8)	361 (62.3)	
Did report	120 (42.3)	98 (33.2)	218 (37.7)	
Reasons for not reporting (among those who didn't report), n (%)				
Even if I report, nothing will change	57 (34.8)	76 (39.2)	133 (37.2)	0.39
I am scared of being victimized by the authorities	17 (10.4)	35 (18.0)	52 (14.5)	0.04
I do not trust the authorities	28 (17.1)	29 (14.9)	57 (15.9)	0.58
I was ashamed	4 (2.4)	6 (3.1)	10 (2.8)	0.71
It did not happen to me, so it was the victim's choice to report	27 (16.5)	28 (14.4)	55 (15.4)	0.60

Note: The reported p-values are from Pearson chi-squared tests that assesses whether the distribution of responses across each reason differs significantly between men and women.

Following the belief that reporting will not change anything, respondents were asked

why they think sexual harassment is tolerated in public transport, and the lack of consequences for perpetrators is the most widely chosen answer. Authorities not intervening, and poor law enforcement are also widely mentioned, again linking to the reasons given by respondents for not reporting incidents. These reasons are reported in Table 17.

Table 17: Reasons for tolerance of SH

Columns by: Gender	Male	Female	Total	P-value
Why do you think SH is tolerated in PT, n (%)	493 (49.5)	503 (50.5)	996 (100.0)	
Gender roles, n (%)	143 (29.0)	196 (39.0)	339 (34.0)	0.00
No consequences for perpetrators, n (%)	255 (51.7)	326 (64.8)	581 (58.3)	0.00
Harassment is normal, n (%)	181 (36.7)	253 (50.3)	434 (43.6)	0.00
Lack awareness, n (%)	190 (38.5)	193 (38.4)	383 (38.5)	0.96
Inadequate victim support, n (%)	173 (35.1)	225 (44.7)	398 (40.0)	0.00
Cultural attitudes minimise problem, n (%)	107 (21.7)	141 (28.0)	248 (24.9)	0.02
Poor law enforcement, n (%)	225 (45.6)	248 (49.3)	473 (47.5)	0.25
Fear of retaliation, n (%)	210 (42.6)	256 (50.9)	466 (46.8)	0.01
Silenced by society, n (%)	132 (26.8)	178 (35.4)	310 (31.1)	0.00
Authorities don't intervene, n (%)	155 (31.4)	196 (39.0)	351 (35.2)	0.01

In addition to enforcement concerns, Table 17 shows that many respondents (more commonly women than men) also highlighted cultural attitudes, normalisation of harassment and gender roles as reasons for tolerance of sexual harassment. We discuss these "social norms" in section 5 below.

5 Social norms

To investigate social norms related to harassment, Table 18 presents responses to 4 statements about these norms. Respondents were first asked to rate their agreement with each of the 4 statements on a Likert-type scale, where responses ranged from strongly disagree to strongly agree.[18] Respondents were coded as agreeing with a statement if they answered either "agree" or "strongly agree". Respondents were then asked to report their belief about the percentage of male respondents; and then female respondents, who

[18]The statements were: "Women are more likely to accept sexual advances in public spaces, such as public transportation"; "Women often invite sexual advances from men then change their minds"; "It is women's responsibility to take certain precautions to avoid becoming targets of sexual violence or harassment on public transport"; and "Women should be more tolerant to unwanted sexual advances and/or behaviours from men on public transport".

agreed with each statement. We investigate these results by gender of respondent to first identify gender differences in beliefs about social norms. We then see whether perceptions of other's beliefs align with true beliefs for each gender. This allows us to identify areas where actual beliefs and perceptions of beliefs differ.

All of the statements relate to beliefs about women's role in sexual advances: that women should be more tolerant of these, that women invite or accept such advances on public transport; or that women are responsible for taking precautions to prevent harassment. It is clear from Table 18 that men attribute more responsibility to women in all of these statements: the proportion of men agreeing with each statement is significantly higher than the proportion of women agreeing. In most cases, both men and women overestimate other men's and women's agreement with the statements. This is particularly true of men's beliefs: while women on average believe that 46% of men would agree that women should be more tolerant of unwanted sexual advances, in fact only 25% of men in our sample agreed with this statement. Men also overestimate their own gender's agreement: on average, men report that 35% of other men would agree with the statement.

Similar differences emerge for the statements relating to women inviting advances and changing their minds: women anticipate that 61% of men would agree with this statement, while men anticipate that 49% of other men would agree. In reality only 28% of men agree with the statement. Again, with the statement about women accepting advances on public transport, male agreement is overestimated by both genders: women expect that 45% of men would support this view, and men believe that 34% of other men would agree. In reality male agreement is lower, at 27%. Beliefs about men's views on women's responsibility for taking precautions are also overestimated: women expect 63% of men to agree with this, and men expect 55% of other men to agree. The reality, while higher than agreement with the other statements, is lower than our respondents expected, at 49%. Although less pronounced, women's agreement with these statements is also overestimated by both women and men.

While concerning when taken on their own, these inflated beliefs of men's tolerance for sexual harassment are good news from a policy point of view. Based on previous research on the link between perceived social norms and behaviour in public transport, Zhang et al. (2021) find that decisions to misbehave on public transport are related to perceived social

norms condoning misbehaviours. The discrepancy that we note between perceived and actual norms suggests that interventions aimed at correcting these erroneous beliefs might offer a policy mechanism to improve behaviour. Presenting information that more than 70% of men do not agree that women invite, accept or should tolerate advances from men on public transport might lead to more men who are considering making a potentially unwanted advance to rethink this. Bursztyn et al. (2020) tested a similar information intervention aimed at men in Saudi Arabia: these authors found that men underestimated other men's support for women working. Correcting these erroneous beliefs increased men's support for their wives' working.

Table 18: Social Norms: own beliefs and beliefs about others

Columns by: Gender	Male	Female	Total	P-value
n (%)	493 (49.5)	503 (50.5)	996 (100.0)	
Women tolerate advances: agree (Yes), n (%)	121 (24.5)	92 (18.3)	213 (21.4)	0.02
Women tolerate advances: believed M agree, mean (sd)	35.375 (31.798)	45.626 (30.356)	40.552 (31.483)	0.00
Women tolerate advances: believed F agree, mean (sd)	28.641 (36.968)	24.254 (35.997)	26.426 (36.529)	0.06
Women responsible for precautions: agree (Yes), n (%)	243 (49.3)	156 (31.0)	399 (40.1)	0.00
Women responsible for precautions: believed M agree, mean (sd)	55.416 (31.132)	62.505 (29.802)	58.996 (30.658)	0.00
Women responsible for precautions: believed F agree, mean (sd)	47.323 (34.993)	40.954 (34.426)	44.106 (34.836)	0.00
Women invite advances: agree (Yes), n (%)	139 (28.2)	113 (22.5)	252 (25.3)	0.04
Women invite advances: believed M agree, mean (sd)	49.229 (29.242)	60.616 (30.517)	54.980 (30.416)	0.00
Women invite advances: believed F agree, mean (sd)	32.150 (28.525)	26.918 (27.518)	29.508 (28.129)	0.00
Women accept advances: agree (Yes), n (%)	131 (26.6)	101 (20.1)	232 (23.3)	0.02
Women accept advances: believed M agree, mean (sd)	33.854 (28.884)	44.652 (30.543)	39.307 (30.206)	0.00
Women accept advances: believed F agree, mean (sd)	23.367 (25.295)	21.750 (25.407)	22.550 (25.352)	0.31

6 Discussion

In this paper, we conducted a survey among male and female public transport users in South Africa in order to better understand differences between male and female commuters. We also investigated risk and safety perceptions on public transport. Finally, we looked at perceptions relating to social norms, and how these might be leveraged from a policy point of view.

In terms of transport user demographics, we note more older women than older men among transport users. We also see that female transport users are more likely to have completed tertiary education, and to have children than male users. We note taxis being the most commonly used form of transport in our sample, with the fewest users reporting trains as their main mode of transport. Men are more likely to be very early morning (pre-6am) commuters than women, possibly related to women facing greater risks at these off-peak times. Interestingly, unlike other research, we do not see significant differences in the number of changes male and female users make on a typical public transport trip.

When we look at safety incidents, we note that women are more likely than men to report having witnessed incidents of physical harassment, stalking or threats. This might be due to women paying more attention to their own risks from such behaviours. The prevalence of different incidents also varies by transportation mode, with threats and verbal harassment being seen most on taxis, while sexual assault and physical harassment appears more prevalent on trains (although it is worth remembering that our sample of train users is very small: n = 35).

Turning to reporting of incidents, conditional on observing harassment, men are more likely than women to report these incidents. Women mention being more comfortable reporting incidents to a female security officer, while men are more comfortable reporting incidents to a male officer. Overall, levels of reporting are low, with only about a third of respondents who witnessed harassment saying that they reported the incident. Prominent reasons given for lack of reporting include not believing that anything will change as a result of reporting, not trusting the authorities and fear of victimisation by authorities. These are concerning, even if not surprising, findings.

Finally, we investigate the role of social norms. Our most interesting finding here

was that both men and women significantly overestimate other men's tolerance for behaviours related to sexual harassment. This finding could offer an interesting policy angle that is worth investigating in future research. Existing research has shown that correcting erroneous beliefs about the social support for undesirable behaviours can improve those behaviours. We hypothesise that correcting perceptions about the number of people who believe that sexual harassment is acceptable might help to reduce the amount of harassment experienced by women in public transport.

It is worth noting that this study made use of a non-random, convenience sample. As such, the sample is not representative of all public transport users. While we glean some useful insights, before implementing any policies based on these insights, it will be important to test policy impacts on a representative sample.

7 Conclusion

Findings from this proposed study go beyond highlighting the prevalence of sexual harassment and violence against women and girls in public transport to include the underlying motivation of such behaviours and provide guidelines for effective intervention with targeted policy design and implementation. Our findings highlight some weaknesses/gaps in public spaces. Possible enhancements could, for example, provide reminders of safety in public transport (advertisements on public transport modes and terminals, TVs, radios, social media, newspapers, etc.). Other options could include increasing security presence at terminals and on the modes of public transport, providing a secure and non-hostile environment for people reporting sexual violence perpetrated against them or somebody else, or ensuring that public transport and terminals are equipped with toll free numbers that are easily available to public commuters to anonymously report incidences. This research not only informs the broader academic community but also offers valuable insights for policymakers and advocates working towards safer and more inclusive public transport systems and cities in South Africa.

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8 Appendix

Table 19: Trip-chaining by gender

Columns by: Gender	Male	Female	Total
Modes used during one commute n (%)	493 (49.5)	503 (50.5)	996 (100.0)
No, I just take one bus	46 (9.3)	39 (7.8)	85 (8.5)
No, I just take one taxi	249 (50.5)	264 (52.5)	513 (51.5)
No, I just take one train	8 (1.6)	8 (1.6)	16 (1.6)
Yes, I also take another mode of transport (e.g., a bus) for part of my trip.	42 (8.5)	31 (6.2)	73 (7.3)
Yes, I also take another mode of transport (e.g., a train) as part of my trip.	7 (1.4)	4 (0.8)	11 (1.1)
Yes, I also take another mode of transport (e.g., taxi) for part of my trip	13 (2.6)	12 (2.4)	25 (2.5)
Yes, I take 2 or more buses	14 (2.8)	12 (2.4)	26 (2.6)
Yes, I take 2 or more trains	3 (0.6)	3 (0.6)	6 (0.6)
Yes, I take 2 taxis	111 (22.5)	130 (25.8)	241 (24.2)

Table 20: Time spent during commutes

Columns by: Gender	Male	Female	Total
n (%)	493 (49.5)	503 (50.5)	996 (100.0)
time_spent_commuting, n (%)			
Less than 15 minutes	33 (6.7)	37 (7.4)	70 (7.0)
15-30 minutes	172 (34.9)	189 (37.6)	361 (36.2)
30-45 minutes	121 (24.5)	116 (23.1)	237 (23.8)
45 minutes - 1 hour	85 (17.2)	93 (18.5)	178 (17.9)
1- 2 hours	61 (12.4)	46 (9.1)	107 (10.7)
2 - 3 hours	18 (3.7)	19 (3.8)	37 (3.7)
More than 3 hours	3 (0.6)	3 (0.6)	6 (0.6)