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IMPACT OF METRO BUS SYSTEM ON FEMALE MOBILITY IN ISLAMABAD-RAWALPINDI

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ABSTRACT

This study explores the role of public transport system in female mobility in Pakistan. Based on a micro-study, using a mix method approach, this research assesses the impact of the Metro Bus System (MBS) on female mobility in the twin cities of Islamabad-Rawalpindi. Primary data is collected from three groups of female passengers – working women, students, and casual travelers. The findings of this study suggest that the metro bus service in Islamabad-Rawalpindi has improved the service quality of public transportation for female passengers. Despite some limitations it can be concluded that the MBS has effectively addressed issues such as uncertainty and insecurity for female passengers to a great extent. Running feeder buses at link routes, extension of metro bus to the busiest routes interim of daily commuters flow and running female exclusive buses during peak hours can further improve service quality.

Keywords: Public transport, Metro Bus System, female mobility, social mobility, Pakistan

INTRODUCTION

Public transport or mass transit system provides mobility services to the public using shared vehicles. Besides providing daily commuting facilities to the citizens, it also plays an important role in providing several externalities of transportation including decrease in traffic congestions on roads, reduce accidents and environment pollution. Globally, the Metro Bus Systems (MBS) are used to provide public transport facilities to citizens in order to fulfill their daily commuting needs. The MBS is considered as a preferred way of mass transit in terms of safety, comfort and reliability (International Association of Public Transport, 2014). It has been established in major cities of 148 countries around the world, including Pakistan (IAPT, 2014).

In order to overcome growing congestion problems in major urban cities, the government of Punjab initiated the MBS projects to revamp the public transport sector. The need for MBS was felt to provide an affordable and reliable public transport facility to ensure safety and security the commuters. To provide safe, efficient and comfortable public transportation system, the government of Punjab established the Punjab Mass Transit Authority (PMA).

Like males, female population in Pakistan also need to use public transport facility to travel to

work, market and/or to visit relatives or to access public services such as education and hospitals. Females are more dependent on public transport as compared to males because of the use of other transport like motor-bikes and personal vehicles is restricted by norms of society. Yet females in Pakistan face challenges while using public transport due to lack of safe and secure transport system. The MBS was established to provide a safe, reliable, affordable and easily accessible modern public transport system to a larger population of the twin cities. According to the available literature on public transport and female mobility, the security and safety needs of female commuters are somewhat different from those of male commuters. The social and cultural context and some specific physical characteristics of public transit environment put constraints on the mobility of female population. This research will study these patterns in the case of Pakistan Metro Bus.

The Pakistan Metro Bus System (PMBS) operates between Islamabad and Rawalpindi. The line was inaugurated on June 04, 2015 and has achieved highest ridership of 151,000 per day. The PMBS serves the metropolitan areas of Islamabad and Rawalpindi, spans over approximately 22.5 kilometers running from Saddar, Rawalpindi to Pakistan Secretariat, Islamabad. The PMBS is equipped with e-ticketing, intelligent transportation system wand – automated fare collection and electronic video and audio bus scheduling system (AFC-BSS) system – CCTV security on service stations and inside metro buses, and automated escalators and elevators for passengers' convenience. It consists of 24 stations; 10 in Rawalpindi and 14 in Islamabad. Table 1 presents the average ridership at every station of the Islamabad-Rawalpindi MBS on daily basis.

Table 1: Average Ridership at Every Station of PMBS on Daily Basis

STATION	SADDAR TO SECRETARIATE	SECRETARIAT TO SADDAR	TOTAL
SADDAR	1379	0	1379
MARRIR CHOWK	9658	4	9662
LIAQAT BAGH	13151	1276	14427
COMMITEE CHOWK	5367	1323	6690
WARIS KHAN	4360	884	5206
CHANDANI CHOWK	4007	711	4718
REHMANABAD	4316	740	5056
SIXTH ROAD	4142	3033	7175
SHAMSABAD	2601	933	3534
FAIZABAD	933	11489	12422
IJP ROAD	346	16	362
POTOHAR ROAD	1027	97	1124
KHYABANA I JOHAR	10712	2434	13146
FAIZ AHMED FAIZ	736	233	969
KASHMIR HIGHWAY	5600	4535	10135
CHAMAN ROAD	578	796	1374
IBNE SINA ROAD	200	43	243
KATCHERY STATION	398	1358	1756
PIMS	187	37	224
STOCK EXCHANGE	1034	7622	8656
7TH AVENUE	326	50	376
SHAHEED-I-MILLAT	557	10225	10782
PARADE GROUND	39	11335	11374
SECRETARIATE	0	4431	4431
TOTAL			**1,35,221**

(Govt. of Punjab, 2014)

As one of the purposes of PMBS is to provide a safer and reliable transport system to the female commuters, in accordance with the modern transport needs, this study offers a comprehensive analysis of the public transportation experience that influences female mobility in Pakistan. Further, it is about time to evaluate the quality, effectiveness and

maintenance of metro bus projects, and to explore whether the PMBS has made an impact in the context of women mobility.

In Pakistan, mobility has been largely a gender phenomenon. In a sociocultural context of Pakistan, mobility of female population through public transport is often associated with safety and respect. As a result, the mobility of female population becomes restricted (Adeel et al., 2013). In such a scenario, female commuters would prefer a transport facility which is accessible, comfortable and above all which can provide safety and privacy. Due to the lack of affordability of private vehicles, vast population relies on the public transport system for their routine mobility.

A voluminous literature is available on public transport systems and its utility for female passengers, but there has been limited work done in the context of Pakistan. The literature on public transport examines the concerns of (both male and female) passengers in public transportation about safety, accessibility, reliability and affordability significantly influence their travelling decisions. The relationship between female safety and public environment has received much attention in the literature. However, the experience of female passengers about the utility and safety in transit environment has received less attention. Even less is known about the experiences of female population in Pakistan. This study aims to fill this gap by identifying the needs and perspectives of female passengers about their safety, accessibility, reliability and affordability in public transport system in Pakistan. Keeping this in view, this research will examine the female utility of Pakistan Metro Bus System (PMBS), Islamabad-Rawalpindi and its impact on female mobility.

Following research questions will guide this study:

- Has Metro Bus System brought an improvement in the service quality of public transportation for female passengers?
- How the female travelers perceive Metro Bus System in term of accessibility, safety, affordability, and reliability?
- Has Metro Bus System responded to the concerns of female population regarding public transportation environment?

LITERATURE REVIEW

Provision of effective transport system for female population has also grab the attention of some studies recently to improve female population welfare (Turner & Fouracre, 1995). Most of the literature on public transport focuses on affordability and accessibility of overall population. The needs of female and male regarding urban transport system are different (Smith, 2008).

A safe, affordable and reliable mode of public transport helps female population to participate them in education and employment activities (Imran, 2010). Like many other developing countries mobility is highly a gender phenomenon in Pakistan. The safety and privacy of female makes mobility a sensitive activity. Therefore people prefers a mood of transportation which ensures their safety and privacy (Adeel et al., 2014). Easy access to transport facility is considered as the most

important aspect of any transport system. Lack of easy access and lack of desire environment during travel significantly decreases the mobility of female and ultimately their access to basic facilities of health, education and job (NIPS, 2013).

Surveys of the perceptions of transit passengers have revealed a number of issues related to their anxiety about personal security. For one, fear of transit is more pronounced in certain social groups than others. Indeed, gender emerges as the most significant factor related to anxiety and fear about victimization in transit environments (Gilchrist et al., 1998). Researchers have also identified more pronounced levels of fear of public settings among the elderly, certain ethnic groups, and low-income people who typically tend to live in high-crime neighborhoods (Junger, 1987). Important differentiations seem to exist among members of specific social groups in their fear of public settings and transit environments because of age, race, class, cultural and educational background, sexual orientation, prior victimization experiences, and disability status (Gilchrist et al., 1998). Women's fear of crime in public spaces has been adequately documented (Austin & Buzawa, 1984). Research of transit passengers' perceptions of transit safety has also intensified in response to the recognition that anxieties about crime are impeding travel choices and affect transit ridership and revenue (Austin & Buzawa, 1984), and researchers have written guidelines for safer cities and transit environments (Smith, 2008).However, the focus of these studies have not been specifically on women and safety. In contrast, a small subset of studies has focused on women's concerns and fears about personal safety in transit environments (Gilchrist et al., 1998). Criminologists complain, however, that our increased knowledge about the causes of fear has not necessarily translated into nuanced policy responses tailored to the particularities of different groups and physical settings. Additionally, there remains a general lack of knowledge regarding specific female requirements for transit environments. Researchers have argued that "this is partly due to the imperceptibility of women, for which female researchers criticize most of the existing research. It applies a universal human concept based on the assumption that women and men are in the same situation, and therefore, have the same needs and attitudes" (Silva, 1998).

Empirical research has clearly established that the transportation needs and travel behavior of women are different from men (Hall, 1999). Women often work closer to home, make more trip chains between home and child care or school and on to work, and are often accompanied by their children in their trips (Reed et al., 2000). Because they frequently have to do non-work related chores, they need more travel flexibility than men (Valentine, 1990).

Women, however, are not a homogeneous group. As (Valentine, 1990) explains: "There are vast differences between the needs of elderly women, women in the paid labor force, and women whose work is home-based. There are also differences between the needs of women at different stages in their life cycle. Similarly, there will be vast

differences in needs depending on the income of the household and whether women have access to a car."

Fear play important role in detracting female from using public transport. People avoid using specific routes and transporting systems when they believe that they are not safe during journey or at station (Reed et al., 2000). In explaining the gendered nature of fear of crime, criminologists highlight these often "invisible" and under-reported crimes against women. Research shows that lack of safety decreases public transport commuting. A survey conducted by department of Transport UK found that 10% of public transport commuting increases by ensuring safety during travelling, particularly at waiting places (Govt. of UK, 2002). From the surveys on perception of riders revealed that gender is the most important factor related to safety during travelling. It also shows that people with low income background living in low income areas feel more fear due to the environment of those areas (Gilchrist et al., 1998). Long walking distance from station is not only time consuming for passengers but it also lead to creating fear in female passengers. Smith (2008) in his study found that 42% of incidents either take place near vicinities or 36% at transit stations during waiting (Smith, 2008). The delays in bus schedules not only create inconvenience but also create fear for female population by creating more chances of incidents. A study by Tylor et al shows that in UK females use their private vehicles or taxis rather than public transport when they feel unsafety. Females either confine their use of public transport or use when they are accompanied by some male member of family (Thrasher & Schnell, 1974).

Major cities of Pakistan are unable provide an acceptable public transport network for their residence. Available means of public transport are generally categorized as 'inadequate' due to major issues with service quality, coverage, fleet shortage and poor enforcement (Imran, 2009).

However, female travelers are more severely affected than male due to their special mobility needs in the conservative sociocultural settings of the state. Women are considered 'family honor' and often require permission of travel from head of household (Sathar & Kazi, 1997).

Unsafe and unreliable public transport causes stress and discomfort for all kinds of females when they have to travel: female students, working women, and casual travelers. Many females avoid using public transport, particularly on crowded modes such as wagons. Some switch to higher cost modes such as rickshaws and Qingchis. Others adjust their travel timings and routes – but female students and working women often have no choice but to travel during peak hours. Casual travelers may simply do not travel without a male family member (Ali, 2012).

Difficulties with transport can restrict female ability to carry out even the most basic tasks, such as going to the market, visiting the doctor or their children's schools. (Sajjad et al., 2017).

METHODOLOGY

This study takes a mixed method research approach to assess the impact of MBS on female mobility. This research approach was deemed

important where a contemporary phenomenon is being researched and ask questions beginning with 'what', and leading to 'how' and 'why' (Yin, 2009). The quantitative approach will help to rate the service quality indicators, while the qualitative questions will help to explore a deeper understanding of social phenomena that would not always be obtained from purely quantitative data. The qualitative research offers rich descriptions of the social world, whereas quantitative research is less concerned with such detail (Denzin & Lincoln, 2011). Given the nature of this research and its focus on in-depth analysis of the MBS, a mixed method approach was deemed most appropriate.

The study opted purposive sampling technique. This technique involves selecting certain units or cases based on a specific purpose rather than random selections (Tashakkori & Teddlie, 2003). This technique is used when the researcher wants to select a purposive sample that represents a broader group of cases as closely as possible (Bryman, 2016). The purposive sample helps to target individuals/cases with specific characteristics (Silverman & Marvasti, 2008).

In this research, the target population was the female passengers of the Pakistan Metro Bus System (PMBS), Islamabad-Rawalpindi. A sample size of 150 female passengers was extracted to study change in mobility before and after the provision of MBS in the twin cities (see table 4). Three major groups of female passengers were identified: (a) working women (b) students, and (c) casual travelers. The 'working women' group was further divided into two categories based on age bracket, below and above 30 years. The purpose behind the categorization of female passengers was to get clear patterns of different perceptions and experiences based on their differences in commuting purposes. The commuting purpose and age factor may affect the travelling experience and perception of female passengers. The three categories of female passengers have different commuting purposes and it may lead to differences in their perceptions and experiences.

Using a semi-structured interview questionnaire, 150 participants were interviewed at the selected MBS stations. These stations were selected based on the highest numbers of ridership on average. The study manly focuses on the qualitative approach and use quantitative approach to support the qualitative part. Therefore it took 150 handful sample of female commuters and categories it into parts based on age and commuting purpose to cover all the different patterns of perceptions.

Table 2: Sample Size

Target Population	Passengers of Pakistan Metro Bus System (Islamabad-Rawalpindi)					
Sample Frame	Female Passengers of PMBS					
Sample Size			Saddar	Chandani Chowk	Faizabad	Agah Shahi	Jinnah Avenue
	Working Women	<30	5	5	5	5	5
		>30	5	5	5	5	5
	Students		10	10	10	10	10
	Casual Travelers		10	10	10	10	10
	Sub Total		30	30	30	30	30
	Total				150		

This study conducted in-depth interviews from 30 respondents at each selected station. Interviews were conducted at morning, afternoon and evening time to cover the respondents of all the three categories.

The study used following indicators to measure the overall utility of MBS for women passengers. These indicators or themes were further breakdown into sub-themes to measure the responses of participants (see table 6).

Table 3: Indicators to Measure the Overall Utility of MBS for Women Passengers.

INDICATORS	WHAT TO MEASURE (Before and After MBS)
Accessibility	▪ Accessibility of bus station ▪ Connectivity to destination ▪ Timings to passenger convenience ▪ Affordability
Reliability	▪ Waiting time at bus station ▪ Journey time (reach destinations) ▪ Arrival of bus at schedule time
Tangibility	▪ Seating space at stop ▪ Seating space during peak hours ▪ Elevators are working properly
Assurance	▪ Safety at bus station ▪ Safety inside buses ▪ Behavior of staff
Responsiveness	▪ Information of buses at bus stops ▪ Information about change in schedule ▪ Complaints
Economic Opportunity	▪ Increase in female participation in economic activates
Ease in Using Automated Systems	▪ Use of Automated token system ▪ Use of Automated exit and entry points ▪ Use of Elevators

Source: Authors' Conceptualization

Data Analysis

To analyze the data, (Ritchie et al., 2013) 'thematic framework' method was used which requires three forms of activities: (a) data management, in which the raw data were reviewed, coded and sorted; (b) descriptive accounts, in which the researcher identified key dimensions, calculated the range and diversity of phenomena; and exploratory accounts, in which explanations were built to describe and articulate the collective perceptions and experiences of the respondents in a meaningful way.

The evaluation criteria of 'trustworthiness' of qualitative research was also ensured in this research. Trustworthiness is made up of four criteria: credibility, dependability, conformability, and transferability. To make this research 'credible', it was ensured that the findings were derived from the primary data collected from the fieldwork. Technique of data 'triangulation' was employed, which involves using more than one source of data to validate findings. Data triangulation helped to enrich the quality of information collected and increased confidence in the research findings.

In addition to the qualitative thematic analysis of data thematically, the study analyzed the quantitative data collected about the ratings of services. In addition to the thematic framework, 'content analysis' approach was used to interpret the textual material. The data is presented in percentages, averages and in ranges. The application of content analysis comprised of three distinct approaches: conventional, directed, or summative. In conventional content analysis, coding categories are derived directly from the text data. The directed approach starts with a theory or relevant research findings as guidance for initial codes. While, a summative content analysis involves counting and comparisons, usually of keywords or content, followed by the interpretation of the underlying context (Hsieh & Shannon, 2005). This research expedites the 'summative content analysis' to evaluate the impact by examining the change in female perceptions and experiences about public

transport facilities before and after the provision of Metro Bus service in Islamabad and Rawalpindi. Since, content analysis mainly describes textual material in quantitative terms (i.e., what), use of thematic analysis of interview discussions will help to provide rich description of patterns (i.e., why and how). A combination of such a qualitative and quantitative approach is known as one of the ways of using triangulation, which according to (Flick, 2018), is "used as a strategy of improving the quality of qualitative research."

To ensure the 'dependability' of this study, auditing approach was adopted where all records related to the research process which includes problem formulation, selecting research participants, data collection, notes related to fieldwork and transcription of interviews were held in an organized manner. Trustworthiness of study cannot be assessed if research does not maintain audit trail. Further, the criterion of 'objectivity' was also ensured during the research process. Utmost attention was given to this aspect in such a way that personal values, biasness and interests of the researcher would not influence the findings of this study. Finally, the preliminary findings were analyzed further under relevant themes and sub-themes.

FINDINGS AND DISCUSSION

The findings and discussion, based on the analysis of the primary data, are arranged under the following themes:

1. Accessibility and Connectivity
2. Automated System and Tangibility
3. Affordability, Reliability and Responsiveness
4. Safety and Assurance
5. Ease in Mobility

Accessibility and Connectivity

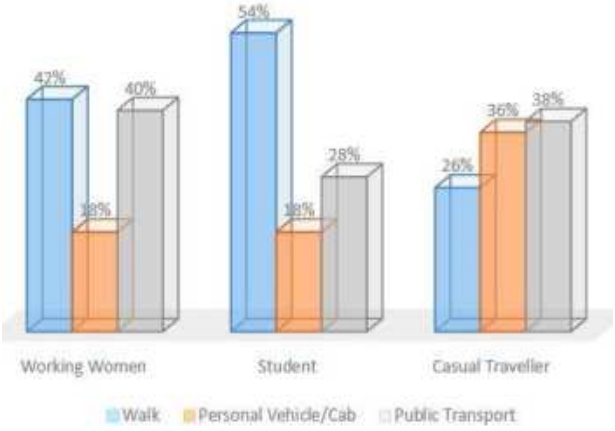
Accessibility refers to the easy access of public transport to all categories of commuters. The influential zone in term of accessibility is defined as 1 km or the walking distance from home to station (Das et al., 2013). To assess the ease in accessibility of the Pakistan Metro Bus System in Islamabad-Rawalpindi, this research measures (a) the accessibility or distance to nearest PMBS station, (b) connectivity to desired destination, (c) transport timings to passengers' convenience, (d) and affordability in terms of financial expense. To measure the impact, accessibility of the PMBS was compared with other public transport facilities currently or previously utilized by the female passengers.

The findings suggest that slight majority of students (54%) enjoy easy access – within 5-10 minutes distance – to PMBS station, while it takes 15-20 minutes to most of the working women (58%) and casual travelers (74%) to reach the nearest station. Due to lack of easy accessibility, most of the PMBS female passengers have to take other means of transport – including other public facility or private vehicles – to reach the nearest PMBS station, whereas some reach MBS station by walk.

"Varan transport system [private company] was much better if I compare it with the metro bus. I live in Sector G-11… (For Varan) I had to walk for a minute from my house to catch the Varan bus. Whereas now, I have to travel via van or sometime use taxi to reach the Metro Bus station... Then I have to walk for 10-15 minutes from metro station to my office." (A working woman).

Figure 1 presents the different ways or means used by female commuters to reach to PMBS station from their homes.

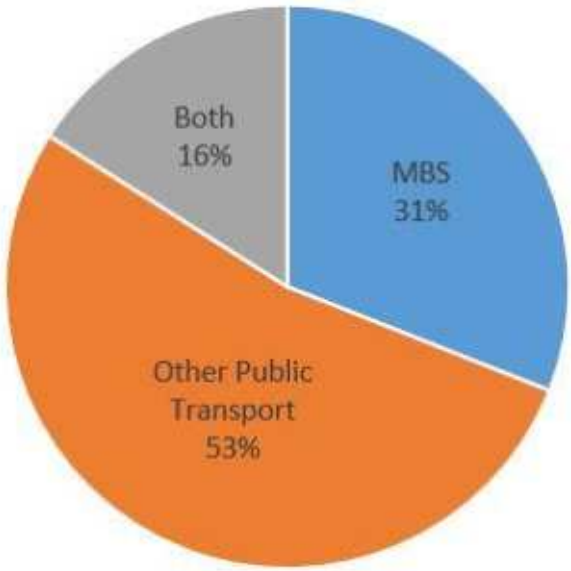
Figure 1: How to Reach the PMBS Station



The findings indicate that despite difficulty in accessibility of PMBS, female commuters mostly prefer to travel on it as compared to other public transport facility because it provides a safe, reliable, affordable and comfortable transportation. Whereas other transport facilities are easily accessible but either they are not safe and comfortable or not always affordable. While comparing the accessibility of PMBS station to other public transport facilities available, a vast majority of participants indicated that other public transport facilities were more easily available round the clock. Majority of the respondents confirmed that they walk for 5-10 minutes to access a public transport van, Suzuki pickup or taxi. Das et al. (2013) suggest that the influential zone for an easily accessible transport mean is 1-kilometer or walking distance from home to station. Applying this standard to access PMBS in Islamabad-Rawalpindi, the findings suggest that people living in 1-kilometer influential zone or at walking distance are comparatively low than those who have to cover long distance to reach the PMBS station.

Figure 2 presents the comparison of ease of accessibility between PMBS and other public transport facilities. Overall, it indicates that 53% of female commuters perceived that other public transport (van or Suzuki pickup) are more easily accessible, whereas 31% believed that PMMB is more accessible as compare to other public transport. Only 16% of female commuters confirmed that both PMBS and other public transport are equal in term of ease in accessibility. Respondents indicated that people living closer the metro bus route can access the facility easily but majority of respondents are living in areas far away or their desired destination are at distance from PMBS station.

Figure 2: Ease in Accessibility



Connectivity of Metro Bus System

The findings of the study suggest that majority of travelers get to their desired destinations – mostly home, education or work place – via Metro

Bus, however the interconnectivity of other public transport facilities were considered more reliable if travel is required for other parts of the city. Research participants confirmed that PMBS route covers limited areas of the twin cities due to which people have to take next journey on other public transport facility to get to their desired destinations. Again, a number of respondents demanded feeder buses and opening of more routes of the metro bus so that the public can reach other than limited destinations.

As compared to PMBS, a vast majority of respondents from all three groups of participants suggested that other public transport facilities are more interconnected. In term of coverage of areas or destinations, a large percentage of respondents say that PMBS route covers limited area and destinations since other public transport covers almost all areas of the twin cities.

Automated System and Tangibility

Operations and maintenance is one of the biggest challenges for any project to sustain its services. This section presents findings and discussion related to respondents' perceptions and experiences about tangibility and use to automated systems installed at the metro bus stations and inside the metro buses.

Tangibility

Tangibility refers to the facilities such as the elevators, escalators, air conditions, free Wi-Fi service, cleanliness and maintenance of stations and buses, and seating space at the metro stations and inside the metro buses, and availability of comfortable seating. The respondents were asked about the working of elevators, escalators, Wi-Fi, air-condition, cleanliness at stations and inside buses, availability of seats at stations and inside buses and about comfortable seating system.

The findings indicate that overall PMBS scores high (above 90%) against tangibility. Most of the respondents from all three groups were satisfied with the available facilities at the bus stations and inside buses, and indicated that the facilities were well maintained and working properly. There were zero complaints about the working of the air conditioning inside the buses, while a few participants highlighted issues related with the working of elevators and escalators.

This high satisfaction of passengers about the air conditioning, elevators and escalators was mainly due to their past or current experiences about other public transport which lack all these facilities. Respondents indicated that it was very difficult for them to wait for van or Suzuki along road sides where there were no seating space and shelter from rain and sun. Inside other public transport they have to bear heat during summers. They can use elevators and escalators to reach station. Passengers can now travel in an air-conditioned public transport system.

"Unlike other public transport, the metro bus is a respectful transport facility… I used to wait for the van for hours, mostly along road side with males all around and dust… sometimes in direct sunlight and rain… I now prefer to take Metro bus despite that I have to walk for 12 minutes to reach this station." (A working woman)

Cleanliness and Maintenance

Cleanliness and maintenance of public transport system is another indicator to evaluate the tangibility. After more than three years, since the metro bus started its operation in the twin cities, this

research explores whether PMBS stations and buses are clean and well maintained.

The content analysis indicates excellent conditions at the metro bus stations. A clear majority from all the three groups of respondents confirmed this. Around 78% working women, 68% students and 74% casual travelers considered excellent cleanliness at the metro stations. Similarly, 20-30% of respondents from all groups ranked the cleanliness conditions as good.

The compression of cleanliness at stations with other public transport was not possible because according to the respondents there were no proper station system exist at other public transport facilities.

The participants were asked about their views and experiences about the cleanliness inside the metro bus. Again, the content analysis indicates excellent to good cleanliness conditions inside the metro buses. Around 94% working women, 90% students and 96% casual travelers rated the cleanliness inside the metro bus as good and excellent.

"I used to travel on taxi for work. It was expensive and in poor condition… Now I travel on metro bus. Although I have to walk a little to reach my hospital (PIMS, Islamabad), but it is a clean ride, air conditioned and cheap." (A Working Woman)

When participants were asked to compare the cleanliness inside the metro bus with other public transport they used, a clear majority indicated poor to very poor conditions of other public transport facilities. Around 70% working women, 56% students, 72% casual travelers indicated poor to very poor conditions of cleanliness in other public transport facilities.

"Private vans are disgusting. Their seats are grimy and door handles are filthy. There is sweating smell inside the van and you cannot avoid it… Metro buses are so clean. I love travelling on it." (A university student)

Seating Space

When respondents were asked about their views about the seating space, a clear majority indicated issues with seating space inside the metro bus. Participants indicated that there was limited reserved seats for female passengers as compared to the space allocated for male passengers. Around 58% of working women, 76% students, and 86% casual travelers expressed dissatisfaction and indicated that they face a lot of problem while riding the metro bus, especially during peak hours.

"The seating space is too small. A lot of female passengers ride these buses every day, but there are only 12 seats available for us, and a small area to stand. Most of us have to travel the whole journey while standing." (A university student)

A majority of female passengers indicated that they do not find seats during morning, afternoon and evening times if they start their journey from any stop other than Sadar or Pak Secretariat (both ends). In addition to congestion problem, most of the participants also highlighted the lack of proper separation of female-male compartments. During rush hours, the male passengers sometimes get into the female side and even sit on the reserved seats for female passengers, or some young males try to stand just next to females.

"Space is an issue. Although there are CCTV security inside the buses, but males standing just next to me always bother me a lot. There is no physical (female-male) separation of compartments… There should be!" (A working woman)

Probing what can be done to overcome this problem, a number of respondents demanded more seating space with a clear physical separation of compartments and running female only metro busses after every interval during peak hours.

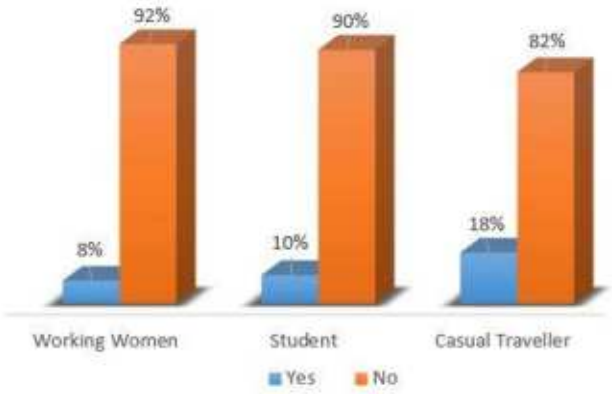
In addition to the above, on the question about seating space at the metro bus stations, around 49% of passengers said they find seat at stations while waiting for bus, and 46% said they do not need a seat at the station because the buses arrive quite frequently; after every three minutes. On the question about comfortable seating system, a clear majority (84%) of respondents said that seats inside the metro bus are comfortable.

Use of Automated System

The automated system refers to the use of electronic technology such as the token system, use of token at the automated entrance and exit gates, and use of escalators and elevators at the metro bus stations. The research participants were asked about the use of automated systems separately. The overall findings in this context suggests that most of the respondents, above 90%, were able to use automated facilities easily and indicated that the electronic technology was working properly at the stations. The behavior of staff members at station and during travel also creates concerns for passengers. Female passengers prefer technological solutions at mass transits and replace staff with automated machines at stations and in buses (Thrasher & Schnell, 1974). The findings suggest that there was proper deployment of trained staff at the entry and exit gates of the metro bus station to guide and help passengers. A working woman said

"Initially I faced difficulty at the entrance and exit gates… (but) there were female staff members who guided me how to use the token… the fixed token system is very good initiative from metro bus. There is no conductor (ticket collector) inside the bus."

Figure 3: Difficulty in Using Automated Token



Overall, findings indicate that the passengers from all three groups were quite satisfied and comfortable with the automated electronic system and considered it a good initiative from PMBS. Figure 3 shows the difficulty in using the automated token system at the PMBS. More than 90% of working women and student were comfortable using the automated system, while around 82% of casual travelers faced no difficulty. Around 18% of casual travelers experienced some difficulty, perhaps because they were not frequent riders of metro bus while working women and students were regular travelers.

Affordability, Reliability and Responsiveness

Affordability in the context of public transport refers to the ability of passengers to pay out-of-pocket for a journey to work, education, market or to access other destinations for social activities. Affordability of public transport impact the mobility of common man, especially from a poor and low-income family to a large extent. Similarly,

reliability such as waiting and travel time, and information about the schedule of public transport matters for commuters. A reliable service enables the commuters to plan their journey and reach destination on time.

Affordability

To examine the affordability, the respondents were asked about the affordability of public transport system, both PMBS and other public transport options. A consensus finding suggests that the PMBS provides an affordable public transport system which was previously absent in Pakistan.

Table 4: Affordability of Metro Bus versus Other Public Transport Facilities

	RESPONDENTS		
	Working Women	Student	Casual Traveler
Affordable Metro Bus	Yes 100%	Yes 100%	Yes 100%
Affordable Past/Other Transport Facility	Yes 70% No 30%	Yes 60% No 40%	Yes 62% No 38%
Metro vs. Past/Other Public Transport Facility	100% say MB is more affordable than other Public Transport	100% say MB is more affordable than other public transport	100% say MB is more affordable than other public transport

A majority believed that it is affordable, while a minority group indicated that other public transport is not affordable. When probed reasons behind the response of the minority group, the findings suggest that respondents were mostly indicating private cab service as other public transport facility. Nevertheless, when respondents were asked to compare the affordability of metro bus versus other public transport facilities, a consensus response came up in favor of PMBS. Majority of respondents said that though other public transport is affordable too, but as compared to PMBS, other public transport is bit costly and also do not provide facilities which PMBS provides.

"Metro bus is undoubtedly a great relief for me, both in terms of time and money... I enjoy my rides to college every day. My elder sister used to travel on private cab for her college, which was expensive and lacks security and cleanliness." (A college student)

The government provides a subsidized journey to passengers. Majority of respondents considered that although other public transport is not always expensive, but as compared to other public transport PMBS is more affordable. Apart from this a section of respondents said that the other public transport may charge less but they do not pay the worth of that fare. They do not provide a safe, reliable and comfortable transportation like people enjoy in the metro bus which provides all facilities in cheap fare.

It is important to note that a significant number of female passengers were using cab or riksha for their daily commuting purpose, either to reach the metro station or to their desired destinations from the metro station. A number of respondents, especially working women, were paying thousands of rupees per month in addition to the metro ticket to complete their journeys. Hence, most of them demanded feeder buses and opening of new routes of metro buses in the twin cities. The analysis also suggests that the affordability factor was linked with the safety, reliability and comfort female passengers enjoy at the PMBS.

Reliability

The reliability refers to the frequency of arrival of the metro buses, time taken to complete the journey and information mechanism about bus schedule, route map and information related to bus schedule and fare. The respondents were asked about the frequency of arrival of buses, availability of proper information mechanism, about routes and time taken by buses to get to desired destinations.

Table 5: Waiting Time for Metro Bus versus Other Public Transport Facilities Used

	RESPONDENTS		
	Working Women	Student	Casual Traveler
Waiting Time for Metro Bus	3 minutes: 98% 5 minutes: 2%	3 minutes: 99% 5 minutes: 1%	3 minutes: 98% 5 minutes: 2%
Waiting Time for Other Transport Facility – Van/Suzuki/Can/Careem	5 minutes: 30% 10 minutes: 58% +10 minutes: 12%	5 minutes: 40% 10 minutes: 50% +10 minutes: 10%	5 minutes: 25% 10 minutes: 10% +10 minutes: 65%

Exploring the waiting time female passengers experience while using the metro bus, the findings suggest that a vast majority get place in the metro bus within three minutes, while a few sometimes have to wait for a bus with space during peak hours.

"I hardly wait for two minutes… by the time I reach the bus gate from the entry point I find a bus there… and even if I miss one, I am confident to catch the next bus in just three minutes". (A student)

The respondents from all three groups indicated that the PMBS is a highly reliable mode of public transport as compared to other public transport options. The consensus response indicated that the metro buses come on their schedule and passenger usually do not have to wait for the metro bus for more than three minutes.

Female passengers who previously or currently using other public transport indicated that they have/had to wait for more than 10-20 minutes to catch a van, and even when the van comes they have to look for a space to fit in. People fear more during their waiting for vehicle at station or their journey from and to home than during travelling. Smith (2008)in his study found that 42% of incidents either take place near vicinities or 36% at transit stations during waiting (Smith, 2008). Some respondents highlighted that the lack of proper stations and designated seating system and uncertainty in van's arrival create more fear and sense of insecurity.

"There is no van station system in other public transport. You have to stand at the roadside and wait for the van to come… It used to be very tough moments for me to wait for the van, especially when I was alone… We (females) quite often face eve teasing from male fellows waiting for the van standing nearby or passing through." (A university student)

A clear majority of the respondents indicated that before metro bus service they had to pay more money to travel on other public transport, and then they had to make a journey of few kilometers in hours. The respondents highlighted that other public transport service is a hassle as compared to metro bus. The commuters have to change more vehicles and pay for every new journey.

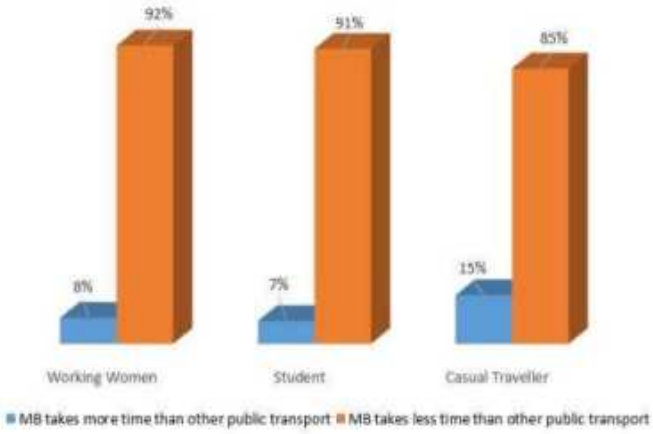
Exploring how much time it takes to reach a desired destination using a metro bus versus other public transport facility, findings suggest that metro

bus covers distance in shorter duration than other shared public transport facility such as van or Suzuki.

A clear majority of respondents from all groups – 92% working women, 90% students, and 82% casual travelers – indicated that metro bus provides a faster journey as compared to other shared public transport.

"Metro bus is highly recommended for those who go to work or for education… I precisely know how much time the metro bus takes, so I plan my journey accordingly. Once I ride the bus, I know exactly when I will reach my station… not worries related to delays." (A Student)

Figure 4: Time Taken to Reach Desired Destination



The figure 4 shows the responses of passengers about time taken by PMBS and other public transport. The bar chart clearly shows that above 90% respondents said that PMBS takes less time as compare to other shared public transport such as van or Suzuki pickup. In contrast, a small number of participants from all groups believed that metro bus takes more time. This small percentage of respondents were those who just travel from one station to other subsequent station. The discussion indicates that a small journey may takes more time on metro bus as compared to van because passengers have to walk into the station using staircase, get into the line to buy a token, pass through the gates to enter the main hall and wait for the bus. In contrast to this, a majority confirmed that van or Suzuki takes more time in longer journey within the city. Van and Suzuki have no proper timings of departure, no binding to complete the journey within specific time, and no fine to observe delays.

"I have come to Islamabad to visit my sister... Before the metro bus, I used to come on a motorbike with a relative or had to take taxi… I had to bother some male member of the family to drop me there. Now, it's so easy, I can travel alone and with no delay." (A casual traveler)

Regarding information of bus schedule and route map a vast majority gave positive response. Participants indicated that metro bus provides a proper information system regarding bus schedule, route map and fare. Metro route maps were displayed everywhere at the PMBS stations and inside the metro buses. In contrast, above 95% respondents indicated that other public transport lack any information system about bus schedule, route map and fare.

Responsiveness

To assess the responsiveness of the metro bus management towards its customers, participants were asked whether they ever made a complaint with the PMBS staff and what was the outcome. The findings suggest that a majority of the respondents either never felt the need to register a complaint or they did not know if there was any such facility available to register a complaint. In contrast, a few respondents indicated that they did register a

complaint with the PMBS management at the metro bus station. The behavior of staff members at station and during travel also creates concerns for passengers. Female passengers prefer technological solutions at mass transits and replace staff with automated machines at stations and in buses (Thrasher & Schnell, 1974).

"I use metro bus every day to attend my college… I was harassed by a small group of boys for a couple of days. My female companions encouraged me to make a complaint, so I did… The PMBS security acted immediately… detained those boys, took their pictures and ID cards, took a written confession, and gave them a warning… Later the security officer shared all the details with me and asked me to get back to them if something else happen again… I never saw those guys on my bus since then." (A university student)

Safety and Assurance

Safety and security is one of the main concerning factors for female commuters and their families while using public transport. Literature suggest that female commuters feel insecure while traveling on public transport due to social and physical characteristics of transit settings. Due to the lack of safe and reliable public transport system females have to adjust their mobility and travel patterns, and sometimes avoid certain means of public transport such as van, Suzuki or taxi. This situation is perhaps more threatening to a particular category of young female commuters, who were more exposed to harassment and victimization. While conducting interviews of 150 female commuter travelling on PMBS, 80% of respondent said that they were using other public transport such as van/Suzuki because there was no other option. While travelling on these shared public transport facilities they were exposed to harassment at stops and while travelling.

To explore what impact PMBS made in this context, respondents were asked about the safety and security at the metro bus stations as well as inside the metro buses. The behavior of the metro bus staff and satisfaction of passengers regarding safety measures were also investigated.

The findings indicate that a vast majority of the respondents (up to 98%) considered the PMBS a safe and secure public transportation system. Respondents were satisfied with the measures taken for safety and security of commuter, especially females. The findings suggest that the environment of metro bus stations, presence of female staff at the ticket counters and waiting areas, and separate seating space for female commuters offer a sense of safety and security. Only a few interviewees expressed that they still sometimes feel insecure, primarily due to the eve teasing behavior of male travelers.

A number of respondents also highlighted concerns about the safety of their belongings during riding the bus.

"I am always worried about the safety of my belongings while traveling. I know there are CCTV cameras everywhere, but it would be difficult to find the thief… due to congestion inside the bus". (A working woman).

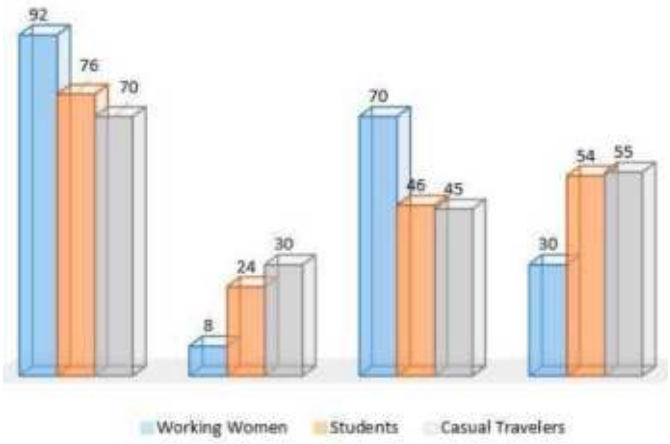
Interestingly, almost 50% of the female commuters, mostly casual travelers, were not aware of the CCTV security cameras installed at the metro stations and inside the metro buses, but they were still feeling safe and secure because of the presence of security

staff, closed and sheltered stations, and designated seating for female commuters inside the bus.

"At metro while travelling I feel safe and secure… Now we can commute with dignity and respect… Metro is a step toward modernization towards development. I feel it is a good improvement… Government should have done this much earlier… Now it is time to expand this service to other parts of Rawalpindi and Islamabad." (A working woman)

Above 90% of the respondents who used or still using van/Suzuki confirmed that the PMBS was a relief from daily harassment females faced at other public transport. Exploring whether female commuters feel safe using other transport facilities, a clear majority from all groups expressed their insecurities: only around 14% working women, 14% students and 8% casual travelers were satisfied about the safety using other transport facilities. The findings suggest that lack of proper waiting areas and security, and absence of schedule were the factors adding to the vulnerability, harassment and victimization of female commuters travelling at other public transport.

Figure 5: Comparison of PMBS with other public transport in term of safety



The findings suggest that harassment was more common among students and young working female or casual travelers as compared to elder women. A majority of the students were victims of eve teasing and comments passing by males while using other public transport, which was very limited at the PMBS. "Metro bus is a relief from that harassment and victimization we used to face", said a university student. On the other hand, elder working women and casual travelers have same views about PMBS and other public transport in term of safety and security.

"I have always faced the worst while using public transport… I always faced disrespect and humiliation while travelling on public transport… The Metro Bus has given relief from daily humiliation and harassment… I am fully satisfied with the Metro Bus service. It has given female a sense of confidence and security." (A working woman)

Exploring safety and security inside the metro bus, most of the female commuters expressed complete satisfaction about the metro bus station environment and the separate section for female inside the buses: 94% working women, 82% students, and 96% casual travelers. A few respondents however still expressed concerns regarding safety measures. They had concerns regarding the overcrowded stations where females have to pass through male crowds to reach the bus gate. Some had concerns regarding the lack of proper separation of female compartment inside the buses. While some indicated that the male commuters come to the female designated area due to absence of proper separation and sit on female reserved seats during peak hours. This creates sense of insecurity

among female commuters, especially students and lone travelers.

"Due to limited space inside the buses we still face problems… government should take some steps in this regard... Run exclusive buses for female commuters during peak hours would be a great initiative." (A university student)

Comparing the PMBS ride with other public transport facilities, respondents indicated that inside the public transport van there was no separate space for female passengers, moreover the eve teasing and glaring by male passengers create insecurity and discomfort. While travelling between the two cities female passengers have to change 2-3 vans and while waiting for every next van they have to face eve teasing and comments from people passing through. "Our men don't have respect for women… They don't understand how insecure and discomfort we face due to their ugly remarks… These men are extra conscious about their mother and sisters, but don't respect women traveling on a public transport", said a working woman.

Exploring the behavior of staff at the metro bus station and comparing this with other public transport facilities, a clear majority of participants from all groups confirmed that the presence of female staff at station gives a sense of security, safety and confidence. The female staff at PMBS were mostly respectful and helpful. A majority of the female commuters expressed confidence and satisfaction over the behavior of male staff too.

"Yes, they deal us respectfully. I feel safer and securer when I see them at the station… I know they are there to help if I ever need them." (A college student)

On the other hand, most of the responses suggest that the staff – conductor and driver – at the other public transport were the main reason for insecurity and unsafety of female commuters. Some respondents, mostly students and young casual travelers, indicated that the drivers and conductors harass female commuters while travelling. Female passengers feel uncomfortable with the disrespect and foul language used by the van drivers and conductors with fellow male commuters. The overloaded vans with closely fitted seats provide opportunity for drivers and other passengers to do unwanted touching.

"I had no other option since I had to sit on the front seat, next to the driver, because these are the only seats reserved for women in the van… unwanted touching while shifting the gears happens too often and is very uncomfortable… I cannot complaint this to my father due to the fear of fight or he may ask me to discontinue your college." (A college student)

Most of the female commuters had demands regarding further safety measures. They demanded the authority to either provide female only compartments inside buses with an increase in reserved seats for female passengers or run female only buses during peak hours. The overcrowded buses and lack of proper separation of female compartments create sense of unsafety among many female commuters during peak hours.

Ease in Mobility

It is evident from the literature on public transportation that a safe, reliable and affordable public transport facility is necessary for ease in female mobility. A safe and reliable transportation not only improve mobility but may also generate

economic and social activity by providing easy access of female to work, education, market place and other social activities. The research participants were asked if they have experienced any improvement in economic activity, ease in mobility, freedom from dependence on male member of family, and access to market for shopping and grocery as social activity.

The safety and privacy of female makes mobility a sensitive activity. Therefore people prefers a mood of transportation which ensures their safety and privacy (Adeel et al., 2014). A significant proportion of respondents indicated that the metro bus service has helped a lot to improve social activities and market access of female population by providing safe and affordable transportation. Interestingly, respondents from all groups gave different reasons for this. For instance, working women were happier to save money they used to spend on cab, students were more comfortable about their safe and comfortable travel experience, while casual travelers were mainly delighted about coming out of male dependence for social activities such as shopping or visiting a family or friend's place.

"I feel safe here (on metro bus)! My brother drops me at the station every morning, and I travel alone to my university in Blue Area, Islamabad." (A university student)

A safe, affordable and reliable mode of public transport helps female population to participate them in education and employment activities (Imran, 2009). Despite a few reservations from a small group of female commuters, a clear majority of the respondents considered that PMBS has brought an ease in female mobility. It has provided a great opportunity for female to engage and participate in economic and social activities. Furthermore, PMBS has given a relief from female dependency on male members to travel on public transport.

"I used to spend hours getting to my office in crowded and smelly vans… By the time I reached my office, my mood was as uneven as my dress. Metro has given a relief from all that situations." (A working women)

Male dependence for female mobility outside house is common in our society. While travelling without male, women are sometimes charged with extra fare or sometimes taken to wrong bus stops. They often face harassment, stalking and poor travel environment in public transport and walking on urban roads (Sohail et al., 2006). Knowing this hostile travel conditions, families do not allow women to travel without male especially the young adults. This research explores whether metro bus service has helped females to reduce this dependence. The findings of this research indicate a significant drop in male dependence. Content analysis of the responses suggests that 92% working women, 76% students, and 70% casual travelers were either traveling alone or had the courage to travel alone on metro bus. In contrast to this, around 30% working women, 46% students, and 45% casual travelers indicated that they cannot travel alone on other public transport facility.

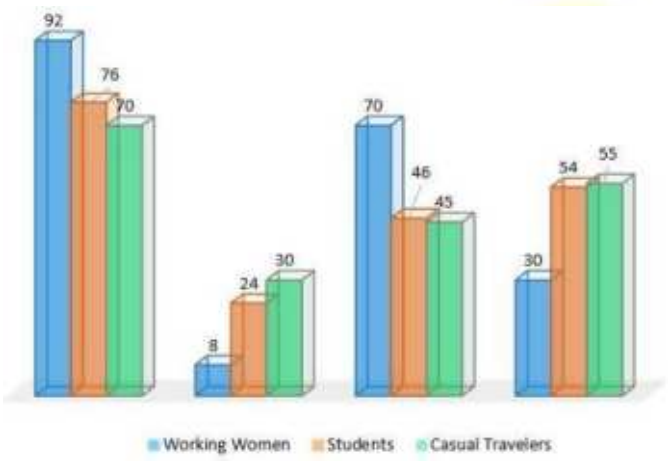
Figure 6 presents respondents experience about their dependence on male members of their families while using the metro bus versus other public transport facility. It is clear from the chart that female passengers were more confident to travel

alone on metro bus as compared to ride other public transport service.

However, still there was a sizeable group of respondents who were confident to travel alone on other public transport service. When probed, respondents, mostly working women and students indicated that despite insecurity they have to take other public transport service to reach office or university on time.

"I travel alone on the metro bus as well as on the van, but I feel comfortable and secure in metro bus… I have to take van from Saddar to my house near Ayub Park… If given an option, I would never ride a (public transport) van again." (A working woman)

Figure 6: Freedom from dependence on male family member



Exploring whether metro bus enables the female population to generate economic activity, a few respondents (mostly maids and nurses) indicated that they have started work after the launch of PMBS.

"I left my work in G-10 due to expensive travel and harassment during travel (at other public transport system)… now working again in Islamabad". (A working woman)

The findings indicate that despite daily victimization and harassment female face, some of them had to use other public transport to meet household expenses.

"I am the sole earners of my family so I have to go out to work every day. Now it is metro bus or van, I need to be at work at any cost". (A working woman)

CONCLUSION

The aim of this study was to investigate the role of public transport system in female mobility in Pakistan. In this context, the objective of this research was to examine the utility of Metro Bus System in female mobility in Islamabad-Rawalpindi. With an overall focus on the impact of the MBS on female mobility in Islamabad-Rawalpindi, this research explored female experience (before and after the provision) of PMBS related to accessibility, tangibility, affordability, safety, reliability, and change in social and economic activity.

This study offers an in-depth understanding of the impact of PMBS on female mobility in Islamabad-Rawalpindi. This study is novel and makes an original contribution to the literature and public policy debate as no other study has so far examined the impact of metro bus specifically on female mobility in the context of Pakistan. This research seeks to inform future policy decisions of the Pakistan government and, more broadly, the private sector in Pakistan by identifying issues and possible ways forward related to the provision of public transportation in urban centers and its role in female mobility.

The overall finding of this research indicates that the metro bus service in Islamabad-Rawalpindi

has brought an improvement in the service quality of public transportation for female passengers leading to ease in mobility of the female population which was absent previously. The analysis on all the service quality dimensions, such as reliability, tangibility and affordability, safety and assurance show that the PMBS has effectively addressed the concerns of female population regarding public transportation environment and has significantly improved female mobility in Islamabad and Rawalpindi by providing respectful and hassle-free transportation.

Despite some limitations such as difficulty in accessibility of metro bus stations, limited inter-connectivity, and unavailability of seats during peak hours, and congestion problems due to small space inside the bus, it can be concluded that the MBS has effectively addressed issues such as uncertainty and insecurity of female passengers to a greater extent. Female commuters of all the three groups – working women, students and casual travelers – were mostly satisfied about their safe, reliable and affordable travel experience which other public transport services lack. The findings of this study highlight areas which required renewed attention by the PMBS as well as by the private transporters to make the travel experience more customer friendly, especially for female commuters.

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