REPORT ON MOBILITY OF CARE ASSESSMENT OF NAIROBI'S PUBLIC MINIBUS TRANSPORT SERVICES

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Conducted by

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LIST OF ACRONYMS

KBS	Kenya Bus Service
SACCO	Savings and Credit Cooperative Organisation
CBD	Central Business District

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CHAPTER 1: INTRODUCTION

The concept *Mobility of Care* was coined in 2008 by Professor Inés Sánchez de Madariaga as a result of a research project she carried out for the Spanish Ministry of Infrastructure (Sánchez de Madariaga, 2009). This research project involved a gender analysis of the main Spanish transport surveys. The objective was to identify gender bias throughout the process of data collection, categorization, analysis, and representation. The main four Spanish transport statistics were analysed: one produced at the national level for all metropolitan areas in the country, published by the Ministry of Infrastructure; one for the metropolitan region of Madrid; and two for the Region of Catalonia.

This concept was then applied to a survey of commuters in Nairobi to assess how the Nairobi public transport system supports the mobility of care. The results of the survey were then used to develop recommendations for improvement in the industry.

CHAPTER 2: LITERATURE REVIEW

2.1 Women's Mobility

Pioneering research on women in transportation started in the 1970s. Sánchez de Madariaga (2013a) provides a summary of the main topics and focus of this body of research which shows consistent and significant differences in travel patterns between women and men in transport:

⇒ Women tend to travel shorter distances in a geographical area closer to the home;

⇒ Women make more trips; they travel for different purposes and their travel purposes differ from men's to a great extent.

⇒ Women have less access to a car and are the main users of public transport systems.

⇒ Women cease driving earlier than men and make more chained trips and more multimodal trips.

⇒ Women's travel patterns tend to be shaped as polygons, as opposed to the commuting patterns prevalent among men;

⇒ Women are more sensitive to safety concerns and tend to self-limit their movements and activities in urban space because of perceptions of risk;

⇒ Women's smaller body size and strength has specific implications for the design of spaces, vehicles and security devices which often are designed according to a standard male reference model.

⇒ Many more men than women work in the transport sector, and the participation of women is particularly low in positions of responsibility.

⇒ Important issues to take into consideration for the study of women in transportation include household structure and life stage, such as having children, having or not having a partner, being a single parent, living alone, and age, all of which impact women's travel.

⇒ Income also matters by limiting transport options, and, while women have increased their participation in the workforce and men have comparatively reduced theirs, gender horizontal and vertical segregation persists in labour markets, as well as the gender pay gap for similar work, with women being over represented among the poor.

⇒ Urban structures, including aspects such as density, mix of uses, availability of transit, and location of housing, facilities and employment centres, are also important factors impacting different travel patterns and behaviour of women and men.

⇒ Race and ethnicity and their intersection with gender are other important co-variables, as in the United States, where both gender differences in travel between racial groups, and gender differences within racial groups have been shown. Safety and security are main issues for women.

⇒ Women are over represented in some groups with greatest transport disadvantage and specific needs: older people living alone, single parents, working parents who take responsibility for most caring tasks.

⇒ Overall, the different travel patterns of women and men sum up to women's comparative disadvantage in terms of access to transportation, which in turn, negatively affects their chances for accessing labour markets, their professional development, their economic status and their personal wellbeing.

⇒ More often than men, women face travel constraints and time poverty in cities.

⇒ Women are often forced to work part time, forsake promotions, or are not able to work at all because of transport and time constraints resulting in the material impossibility of combining work with care.

⇒ While there is some convergence - with some gaps decreasing with increased overall economic levels, such as access to a private vehicle - differences in travel patterns and behaviours persist in both developing and developed countries.

2.2 The 'Mobility of Care' Concept

The *Mobility of Care* concept provides a framework for the analysis of mobility patterns that properly considers the daily mobility of persons who take care of the home and of dependents. The idea of integrating the concept of care and its associated urban mobility, was the result of the above-mentioned project analysing Spanish transportation statistics and is fully explained in *The mobility of care: Introducing new concepts in urban transportation* (Sánchez de Madariaga,

2013a). Further research on the concept carried out by this author has included an analysis of biases on visual representations (Sánchez de Madariaga, 2013b) and the analysis of the mobility of care in the region of Madrid for the population between 30-45 (Sánchez de Madariaga & Zucchini, 2018). Other studies have been conducted in various Spanish and Latin American contexts.

The *Mobility of Care* concept builds on key contributions in gender studies, particularly on the conceptualization of *care* as an important human activity that needs to be recognized, studied, valued, made visible and integrated in policy making.

It goes beyond most previous analysis of women's mobility, which mainly focused on sex differences in transportation, by looking at mobility patterns through the lens of what are the implications for travel behaviour of all activities related to the upkeep of the home and the care of others, irrespective of whether these trips are made by women or men.

By doing so, this concept challenges current conceptual frameworks for transportation analysis. Current conceptual frameworks for the analysis of mobility patterns have been developed in a context in which promoting economic development and supporting the working man's mobility were seen as the main objective of transport infrastructure planning, while the needs of those taking care of the home were not receiving similar consideration. Typically, male travel patterns associated with paid employment and journeys to work have been, and continue to be, privileged as the focus of research, with deep implications for the overall development of the transport field.

The concept of care refers to the activities needed for the reproduction of life, including the necessary tasks for the upkeep of the home and those required for the caring of dependent people, that is, the sick, the young and the old. These

tasks may be realized in the home or in other places and facilities around the city, and they imply the use of transport systems. Most care tasks are performed by women. Most women also work in paid employment, which results in the so-called double work load many women assume. Women who work in paid employment and who also have care responsibilities have complex travel patterns.

As societies evolve, the type and number of care activities required for the reproduction of life increases, as does the number of locations around the city where they take place, and the need for using transport systems to get to those places. The daily chains of tasks performed by persons who have a double workload in the public and private spheres can get quite difficult to accomplish. These chains are more complex than those of people who only work in paid employment or who only have caring responsibilities.

The innovative concept of *Mobility of Care* (Sánchez de Madariaga, 2009, 2013a, 2013b, 2018) provides a tool for a better understanding of the mobility of persons who have care responsibilities in their everyday life (Figure 1). The concept is featured in the *EU-US Gendered Innovations Project* which showcases over twenty case studies on how gender analysis can foster innovation in sciences, medicine, engineering and environment (Schiebinger, Klinge, Sanchez de Madariaga,, & Schraudner, n.d.).

As illustrated in Figure 1, the *Mobility of Care* concept includes all travel resulting from home and caring responsibilities: escorting others;

- ⇒ shopping for daily living, with the exclusion of leisure shopping;
- ⇒ household maintenance, organisation, and administrative errands, which are differentiated from personal walks for recreation;
- ⇒ visits to take care of sick or older relatives, also different from leisure visits; etc.

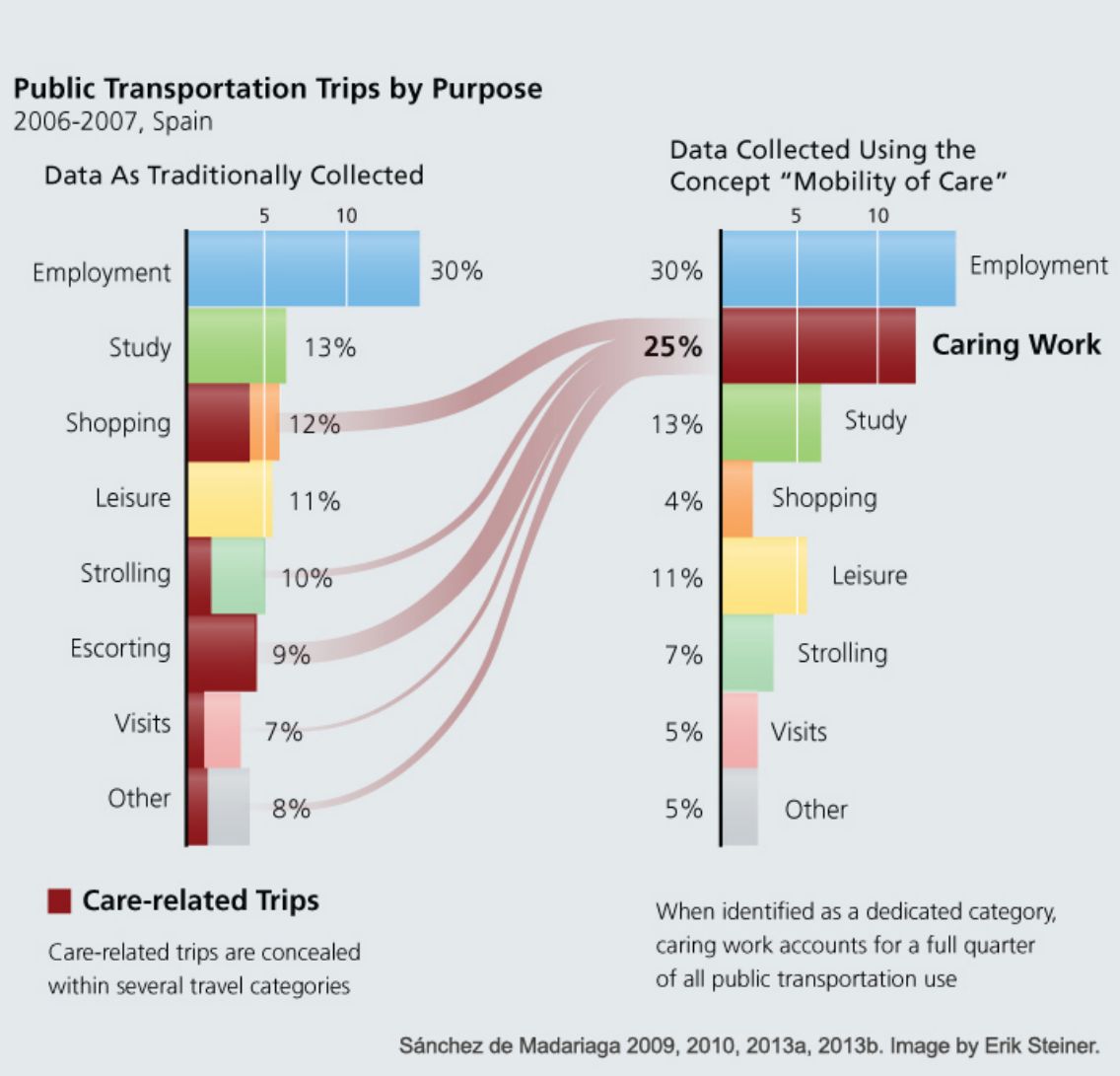

Figure 1: The purpose of public transportation trips as reported using traditional transport research methods vs Mobility of Care concept methods

Many of these care trips are today not sufficiently accounted for in transportation datasets, due to the following factors:

⇒ Care trips can be hidden under other headings when considering the purpose of trips, such as leisure, strolling, visits, or other trips.

⇒ Sometimes they are simply not counted, as frequently happens with trips made on foot and short distance trips of less than one km which are intentionally not included in many surveys because they are not relevant for transport infrastructure design and planning.

⇒ These journeys are not seen as a whole, as a single category. Because statistics capture data on escorting, shopping, errands, etc., as separate and unrelated reasons for travel, rather than as specific tasks within the wider work of social reproduction, the overall weight of the mobility of care is systematically underrepresented.

The *Mobility of Care* concept reveals significant travel patterns otherwise concealed by gender assumptions embedded in data collection variables. In transport surveys, care related trips are not named as such. Care related travel is divided into numerous small categories and is hidden under other headings, such as escorting, shopping, leisure, strolling and visits. Sometimes it is not counted at all, since transport surveys may not count short trips on foot of less than 15 minutes or shorter than one Km. Many trips normally described as "escorting," "shopping," etc., are made for the purpose of providing care or performing home related tasks.

In order to better understand mobility of care, and hence women's mobility, surveys should carefully ask for the purposes of travel, in more detail than is normally done, and include sufficient questions to properly account for trips done for the purpose of taking care of dependents and the home. They also need to identify patterns of trip chaining and inquire on the reasons for not travelling, in particularly for reasons related to perceived safety / unsafety.

Mobility of Care is posed as a counterpart to the well-studied mobility of paid employment, and is distinct from the mobility of leisure, with which it is sometimes confused. It provides a tool for advancing gender perspectives in transport and can contribute to rebalancing current overemphasis on employment towards greater considerations of the daily realities of all persons derived from gender roles in the home and the family.

This conceptual framework allows us to rebalance care and employment in our understanding of how transport systems operate. By doing so, we can better make visible and value the realities and life experiences of men, but also of women, the young, the sick, those with reduced physical capacities, and the elderly.

2.3 Objective of Nairobi Mobility of Care Case Study

Matatus are the most common, affordable and accessible mode of public transportation in Kenya, however there is a high prevalence of sexual harassment incidences and violence against women and girls in these transport spaces. As such, there are efforts to increase the visibility of women's needs in the male dominated field of public transportation in order to reflect a more equitable and sustainable public transport system. It is in this regard that Flone Initiative has been working to create safe spaces for women and girls in the public transport system of Kenya since 2013. Flone Initiative is a women-led organization, working towards the creation of safe, sustainable and accessible public transportation spaces for women and vulnerable groups in Africa, by influencing behavioural change, generating knowledge and movement-building.

The purpose of this project was to conduct a qualitative pilot study, designed by Prof. Inés Sánchez de Madariaga of Technical University of Madrid, which looks at the travel behaviour of women around Nairobi within the *Mobility of Care* framework. Findings from this case study have been used to support the development of the Gender Sensitive Mini-Bus Services & Transport Infrastructure for African Cities Toolkit, which provides practical recommendations and tools to minibus operators, transport organizations management and minibus owners on how to create safer transportation services to women and other vulnerable road users.

CHAPTER 3: STUDY METHODOLOGY

The *mobility of care* case study was conducted with Nairobi commuters, predominantly those using the services of three transport providers: Kenya Bus Service (KBS), KANI SACCO and INDIMANJE SACCO. Purposive sampling was used to identify three public minibus (matatu) service providers in the Nairobi CBD.

Slovian formula was then used to determine the number of people to be interviewed in each minibus service (Slovin's Formula, n.d.). Information triangulation was done to determine the percentage of commuters in each full minibus who represent women and men. The information triangulation was done through interviews with bus stop managers, a physical count of female and male passengers once the minibus was full and queue observation as commuters boarded the vehicles. Based on this, the number of women commuters per particular full bus was around 60% of the total population of a full minibus.

Using a 95% level of confidence and a confidence interval of 10%, the number of women commuters were 273 and the number male commuters was 200 making a total of 473 respondents. A mixed methodology approach (quantitative and qualitative) was applied with a questionnaire acting as the tool of choice, with closed and open-ended questions in order to capture maximum information variation.

Interviews were conducted inside and around these minibuses with commuters. Each questionnaire took an average of twelve minutes to complete. The data was then cleaned and exported to SPSS for final analysis. The questionnaire used can be found in Appendix B.

CHAPTER 4: FINDINGS AND DATA ANALYSIS

4.1 Education

The educational level of the sample population was relatively high, particularly among the women as compared to men (Table 1). Slightly over two of every ten women had university-level higher education degree; while only one in ten men had such academic qualification (Figure 2). The proportion of women with less education, those without full primary or secondary education, was also higher than that of men: around 2 in 10 women, compared to 1 in 10 men, had not completed primary or secondary education. Women with higher and lower education were over represented in the sample, suggesting that both highly educated and little educated women have comparatively less access to other modes of transportation than similarly educated men (Table 1).

Table 1: Gender Cross Tabulation – Level of Education

Respondents Gender * Respondents Education Cross Tabulation							
			Respondents Education				Total
			Without full education or Secondary education	Secondary level education	Non-university post-secondary education level education	University level education	
Respondents Gender	Female	Count	56	69	90	60	275
		% within Respondents Education	71.8%	50.7%	53.6%	74.1%	59.4%
	Male	Count	22	67	78	21	188
		% within Respondents Education	28.2%	49.3%	46.4%	25.9%	40.6%
Total		Count	78	136	168	81	463
		% within Respondents Education	100.0%	100.0%	100.0%	100.0%	100.0%

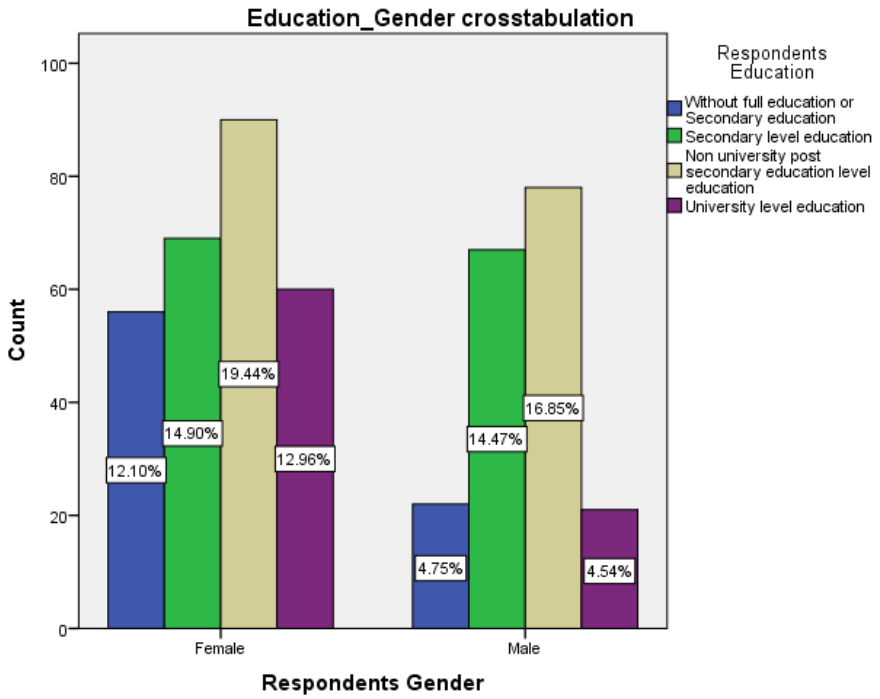

Figure 2: Education levels of survey respondents

4.2 Occupation

Most of the men and women users of the public transport system in the sample were in paid employment, with percentages of 85.7% for men and 71.6% for women (Table 2; Figure 3).

Table 2: Gender Cross Tabulation – Employment Status

Whether the respondent is employed * Respondents Gender Cross Tabulation					
			Respondents Gender		Total
			Female	Male	
Whether the respondent is employed	Yes	Count	197	162	359
		% within Respondents Gender	71.6%	85.7%	77.4%
	No	Count	78	27	105
		% within Respondents Gender	28.4%	14.3%	22.6%
Total		Count	275	189	464
		% within Respondents Gender	100.0%	100.0%	100.0%

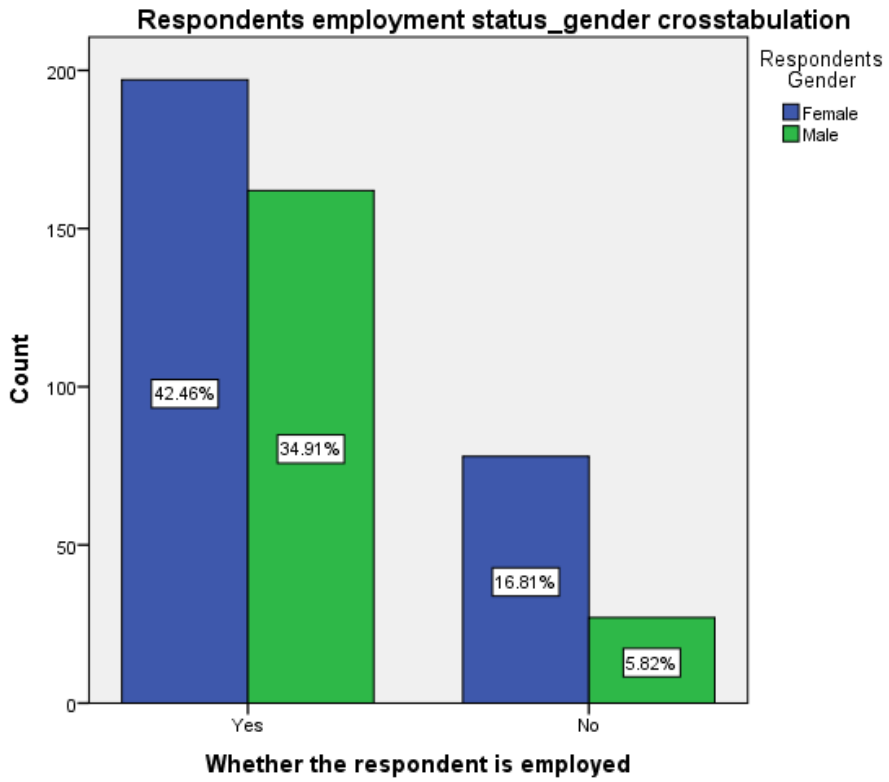

Figure 3: Employment statuses of survey respondents

Regarding the type of employment, the female employed population was quite balanced between those who are self-employed (56.9%) and those who are employed by others (Table 3; Figure 4). This percentage is the opposite for men, with 44.4% of men working in self-employment, and, 55.6% of men working for others.

Table 3: Gender Cross Tabulation - Types of Employment

What type of respondent employment * Respondents Gender Cross Tabulation					
			Respondents Gender		Total
			Female	Male	
What type of respondent employment	Self-employment	Count	111	72	183
		% within Respondents Gender	56.9%	44.4%	51.3%
	Employed by others	Count	84	90	174
		% within Respondents Gender	43.1%	55.6%	48.7%
Total		Count	195	162	357
		% within Respondents Gender	100.0%	100.0%	100.0%

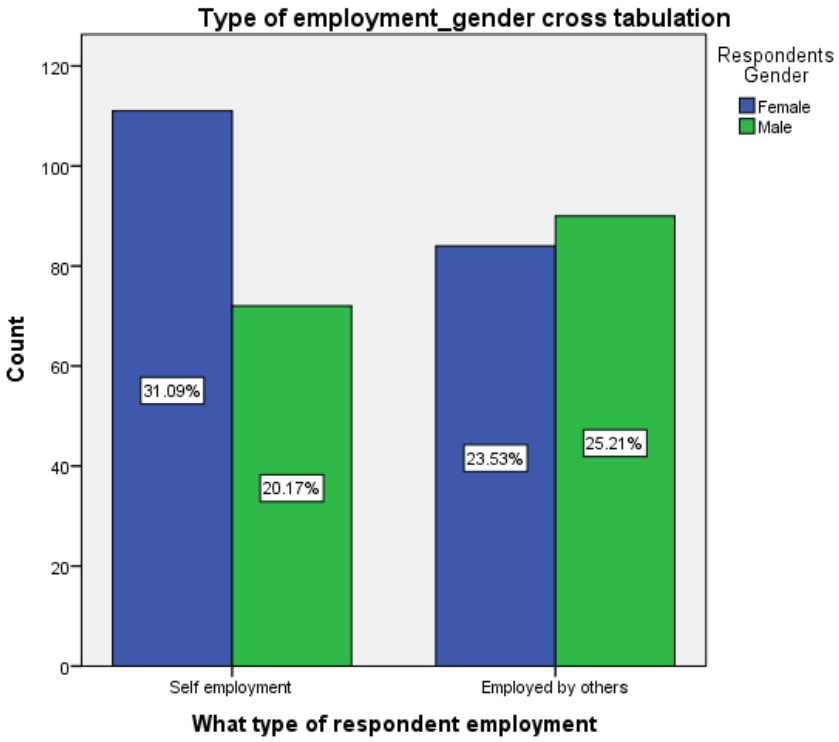

Figure 4: Nature of employment of survey respondents

Regarding the geographical area of residence, eight of every ten employed women lived at a distance of 8-13 km from the city centre; while slightly over 7 of every 10 men lived within the same distance range. 12.8 % of women and 29.5 % of men lived far from the centre (over 14km which includes the countryside). Only 5% of women and 6.7% of men lived close to the city (less than 7 km).

4.3 Household Composition

Most persons in the sample had care responsibilities of dependent persons, most of whom were children under 18 (65.38%). Of these, 13.08% had care responsibilities of siblings; 9.23% had care responsibilities of elderly parents, and 6.54% took care of the whole family (Table 4; Figure 5). Only between 1 and 2% of the interviewed persons had care responsibilities of grandparents, grandchildren, or nephews/nieces.

In 43.3% of the households of women in the sample, there were no children under 18. For the men, this figure was 42.6%. In the households of 21.8% of

women, there was one child under 18; in the households of 17.3%, there were two children under 18; in 12% of the households of women in the sample, there were three children; and in 4.5% of the households of women in the sample, there were four children. Households of women with six or seven children under 18 were few, with only 1.2% of cases.

Table 4: Gender Cross Tabulation - Who are you responsible for taking care of?

Who are you responsible of taking care of? * Respondents Gender Cross tabulation					
			Respondents Gender		Total
			Female	Male	
Who are you responsible of taking care of?	Siblings	Count	11	23	34
		% within Respondents Gender	7.7%	19.5%	13.1%
	Children	Count	109	61	170
		% within Respondents Gender	76.8%	51.7%	65.4%
	All family members	Count	8	9	17
		% within Respondents Gender	5.6%	7.6%	6.5%
	Grandchildren	Count	1	2	3
		% within Respondents Gender	0.7%	1.7%	1.2%
	Nephews/Nieces	Count	6	1	7
		% within Respondents Gender	4.2%	0.8%	2.7%
	My parents	Count	5	19	24
		% within Respondents Gender	3.5%	16.1%	9.2%
	Grandparents	Count	1	3	4
		% within Respondents Gender	0.7%	2.5%	1.5%
	Aunt	Count	1	0	1
		% within Respondents Gender	0.7%	0.0%	0.4%
Total		Count	142	118	260
		% within Respondents Gender	100.0%	100.0%	100.0%

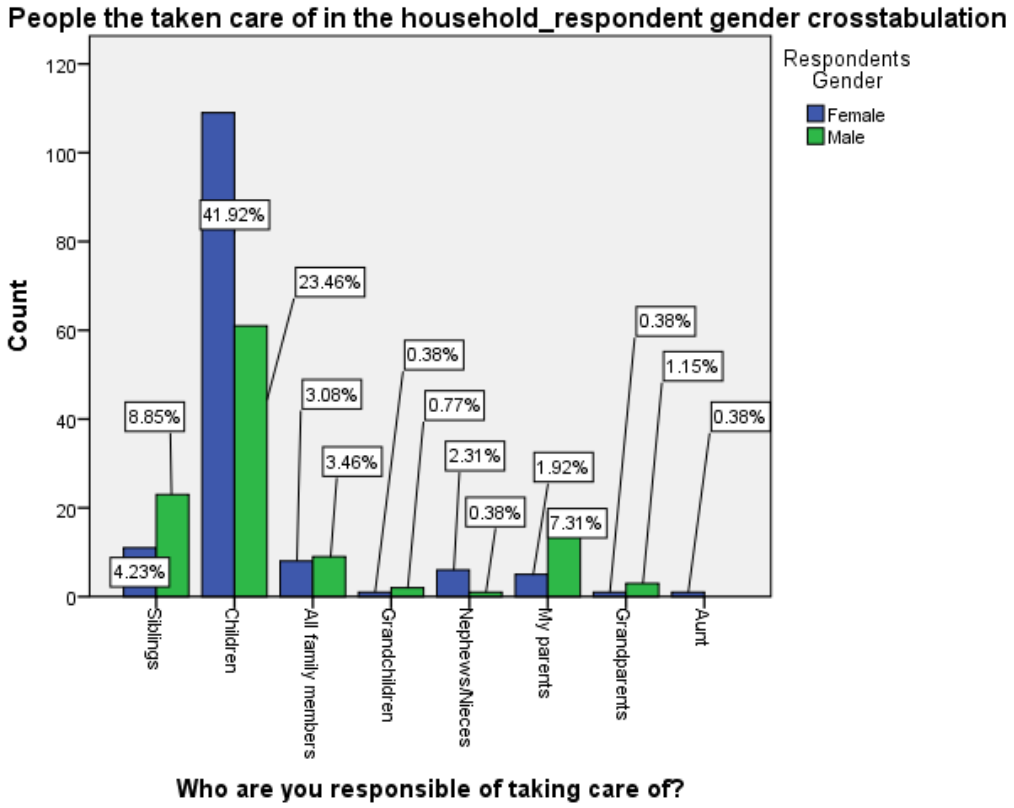

Figure 5: Dependent care responsibilities of survey respondents

About half of the persons in the sample (55.7%) had some sort of care responsibilities. 53.58% of women declared having care responsibilities; with 62.77% of men declaring the same. Most women had care responsibilities over children (76.8%), while slightly over half of men had the same responsibility (52.7%). Care of siblings fell under the responsibility of 19.5% of the men and only 7.7% of women. 5.6% of women and 7.6% of men declared having care responsibilities over the whole family. Only 0.7% of women and 1% more of men took care of grandchildren. More women than men (4.2% compared to 0.8%) had care responsibilities over nephews and nieces. The care of parents seemed to be a responsibility of men in greater amount than of women (16.1% of men having any care responsibility take care of parents, compared with 3.5% of women). This seemed to also be the case for grandparents, with only 0.7% of women and 2.5% of men with care responsibilities. Only 0.7% of women and no men had care responsibilities for aunts and uncles.

4.4 Transport

Most matatu users did not have access to a car in their household. The number of women without a car in their household was lower (77.07%), than that of men, (82.54%) (Table 5; Figure 6). This means women commuters relied on this transport mode despite more of them having access to a car in their house. Men seemed to have a greater reliance on matatus because of not having access to a private car.

Table 5: Gender Cross Tabulation - Is there a car in the household?

Whether there is a car in the household * Respondents Gender Cross Tabulation					
			Respondents Gender		Total
			Female	Male	
Whether there is a car in the household	Yes	Count	61	33	94
		% within Respondents Gender	22.9%	17.5%	20.7%
	No	Count	205	156	361
		% within Respondents Gender	77.1%	82.5%	79.3%
Total		Count	266	189	455
		% within Respondents Gender	100.0%	100.0%	100.0%

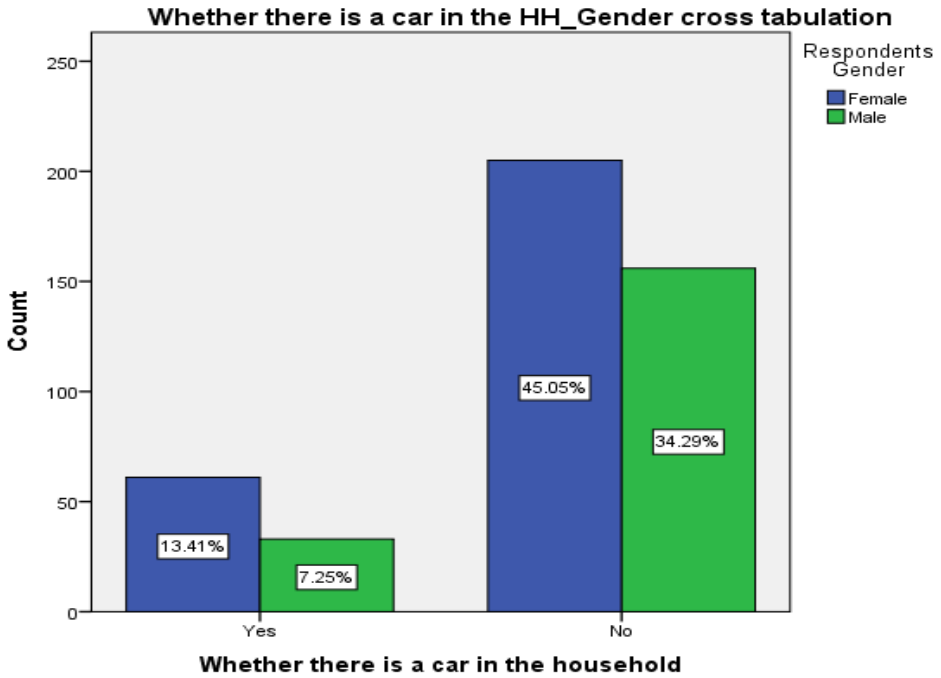

Figure 6: Levels of access to a car in the households of survey respondents

For women with a car in the household, the primary car drivers were their husbands (36.4%) their fathers (27.3%), or themselves (10.9%) (Table 12 (Appendix A); Figure 8). 58.1% of the men with access to private cars declared themselves to be the car drivers, while others reported it to be their fathers (9.7%) or drivers (9.7%) (Table 12 (Appendix A); Figure 7).

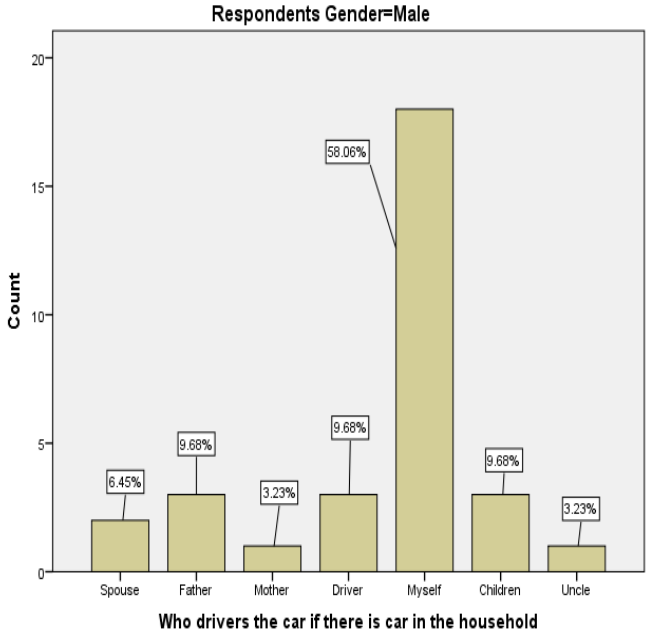

Figure 7: Drivers of cars in the households of male survey respondents

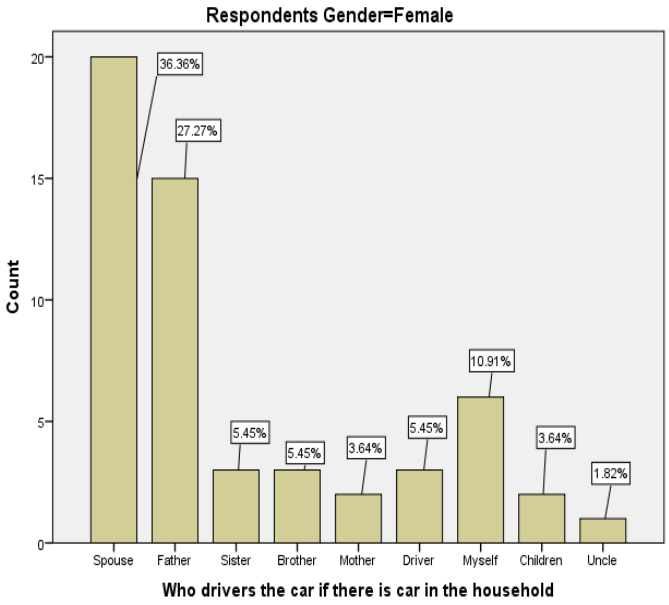

Figure 8: Drivers of cars in the households of female survey respondents

4.5 Trips and Distances

Mobility was high for persons in the sample. Nearly all women (98.6%) declared having taken at least one trip on the previous day, while all the men (100%) reported travelling on the day of reference (Table 6). Further data was collected for up to 3 of the trips reported. Reported durations of these trips have been details in Tables 14 – 16 (Appendix A). The average duration of trips made by persons in the sample was, for the first trip 48 minutes; for the second trip 40 minutes; for the third trip 34 minutes.

Table 6: Gender Cross Tabulation - Mobility during the previous 24 hours

In the past ONE day did you travel? (Either walking or by other means) * Respondents Gender Cross Tabulation					
			Respondents Gender		Total
			Female	Male	
In the past ONE day did you travel? (Either walking or by other means)	Yes	Count	273	188	461
		% within Respondents Gender	98.6%	100.0%	99.1%
	No	Count	4	0	4
		% within Respondents Gender	1.4%	0.0%	0.9%
Total		Count	277	188	465
		% within Respondents Gender	100.0%	100.0%	100.0%

Trip 1: The destination of the first trip was from the city periphery to the CBD for more than half of the sample (66.4% of women and 64.02 of men) (Figure 9). Trips from the periphery to the periphery were second in number (33.33% for women and 30.16% for men). Only 0.37% of women and 5.83% of men travelled from the centre to the periphery.

Trip 2: The second trip followed a different pattern, showing greater gender differences in this case (Figure 10). Up to 45.38% of the women declared a second trip from the periphery to the urban centre, with 39.98% of women traveling from the centre to the periphery, and 15.38% traveling within the centre.

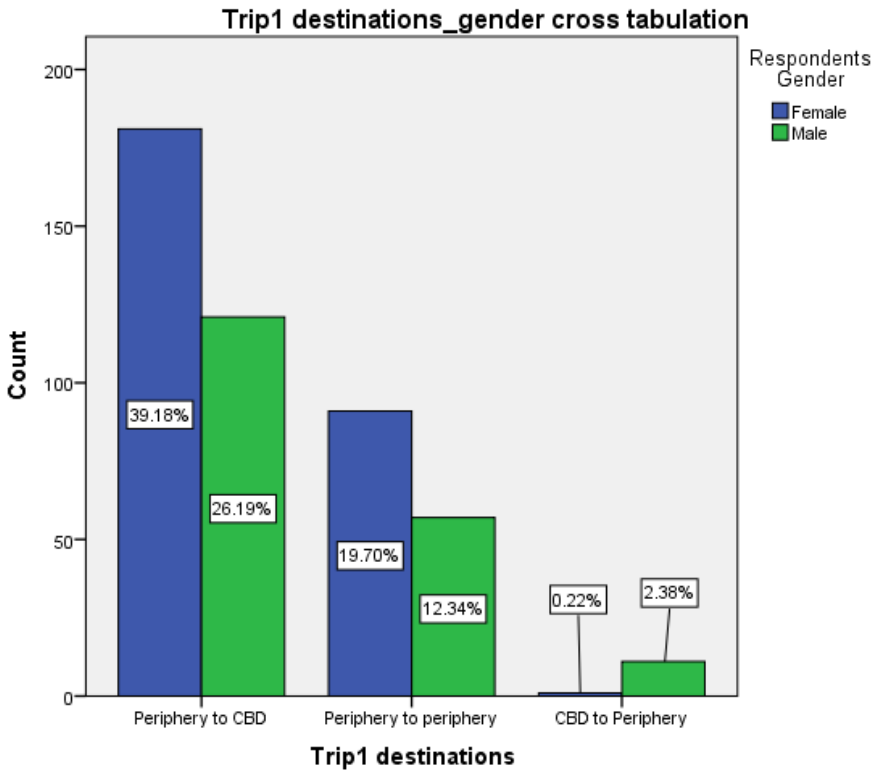

Figure 9: Destinations of Trip 1 taken by survey respondents

For men, however, the second trip most commonly involved going from the central city to the periphery (probably a trip returning home), without chaining any other trip, as was the case with women who showed a different distribution of destinations). The second most common destination of the second trip for men was from the periphery to the centre for 16.67% of the cases, followed by 8.33% who travelled within the central city, and 2.7% who did it within the periphery.

Trip 3: The proportion of women who took a third trip was higher than that of men for any of the considered destinations. In this case, women's destination in the third trip was mainly from the central city to the periphery, followed by trips within the periphery, and from the periphery or the central city to the central city (Figure 11). In the case of men, when they took a third trip, they did it from the periphery to the periphery, or from the CBD to the periphery in a few cases.

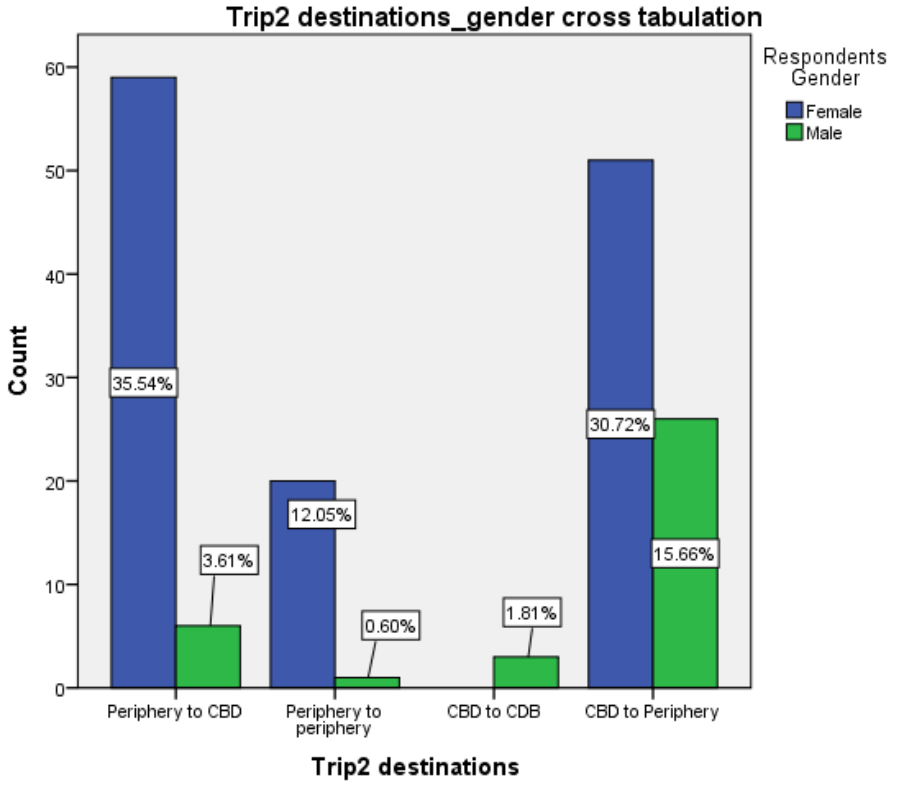

Figure 10: Destinations of Trip 2 taken by survey respondents

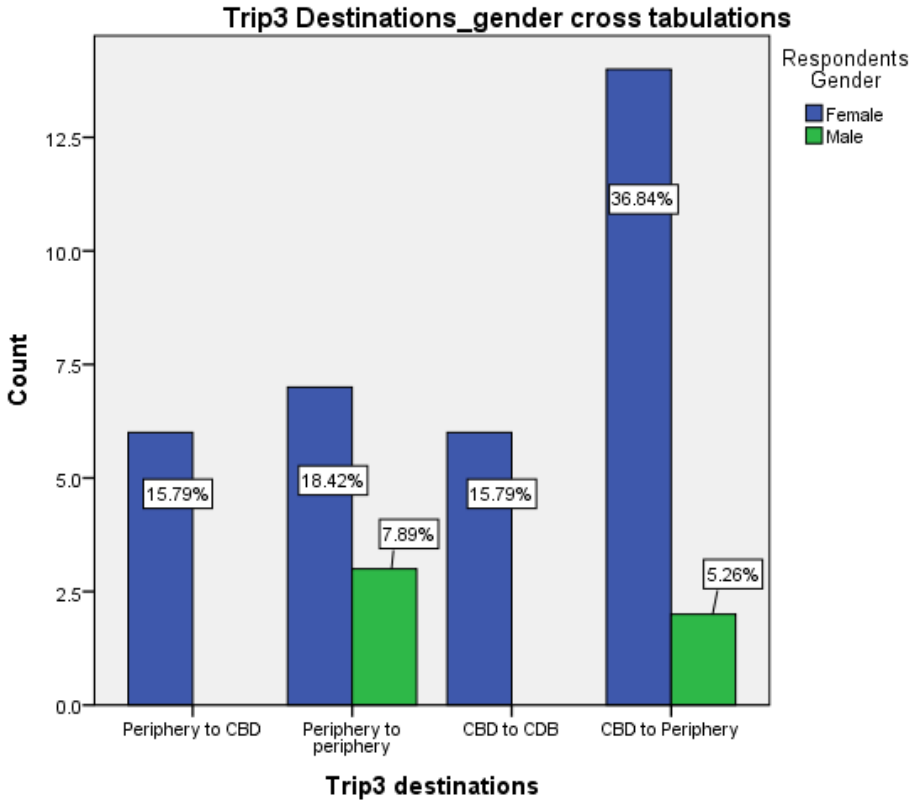

Figure 11: Destinations of Trip 3 taken by survey respondents

A fourth trip was only done by a few women (only 5), while no man declared having taken one.

4.6 Purpose and Mode of Trips

Employment was the purpose of the first trip for 36.06% of women, while this percentage was almost 20 points higher for the men (53.97%), indicating that many more men than women go directly from their homes to their job (Figure 12). Another third of the women (30.86%) used this first trip to connect with another bus, while men did this in only 12.70% of cases. We see in this case a great difference by sex among women and men who make connecting trips. A hypothetical explanation is that men who saw taken by survey respondents the need for connecting trips without the possibility of a direct ride, decided to and could use a private vehicle in greater frequencies than women.

Shopping for household items was the purpose of the first trip by women in 7.81% of cases, while only for 4.76% of men (Table 7; Figure 12). Accompanying other adults/ elderly persons, or children, is the purpose of the first trip for a higher proportion of women than men, although the difference is relatively small. More men than women, again with a small difference, use this trip for educational purposes.

Table 7: Gender Cross Tabulation - Purpose of Trip 1

What was the purpose of trip 1? * Respondents Gender Cross Tabulation				
Count				
		Respondents Gender		Total
		Female	Male	
What was the purpose of trip1	Employment	103	106	209
	Shopping for household items	23	9	32
	Shopping for personal leisure	1	1	2
	Education	11	11	22
	My hospital services	6	8	14
	Accompanying children to school	1	0	1

	Accompanying children for medical services	2	2	4
	Accompanying children for other activities	3	0	3
	Accompanying adult/old persons for other activities	4	4	8
	Personal Leisure	27	11	38
	Connecting to another matatu/bus	83	22	105
	Going home	2	10	12
	Others	3	5	8
Total		269	189	458

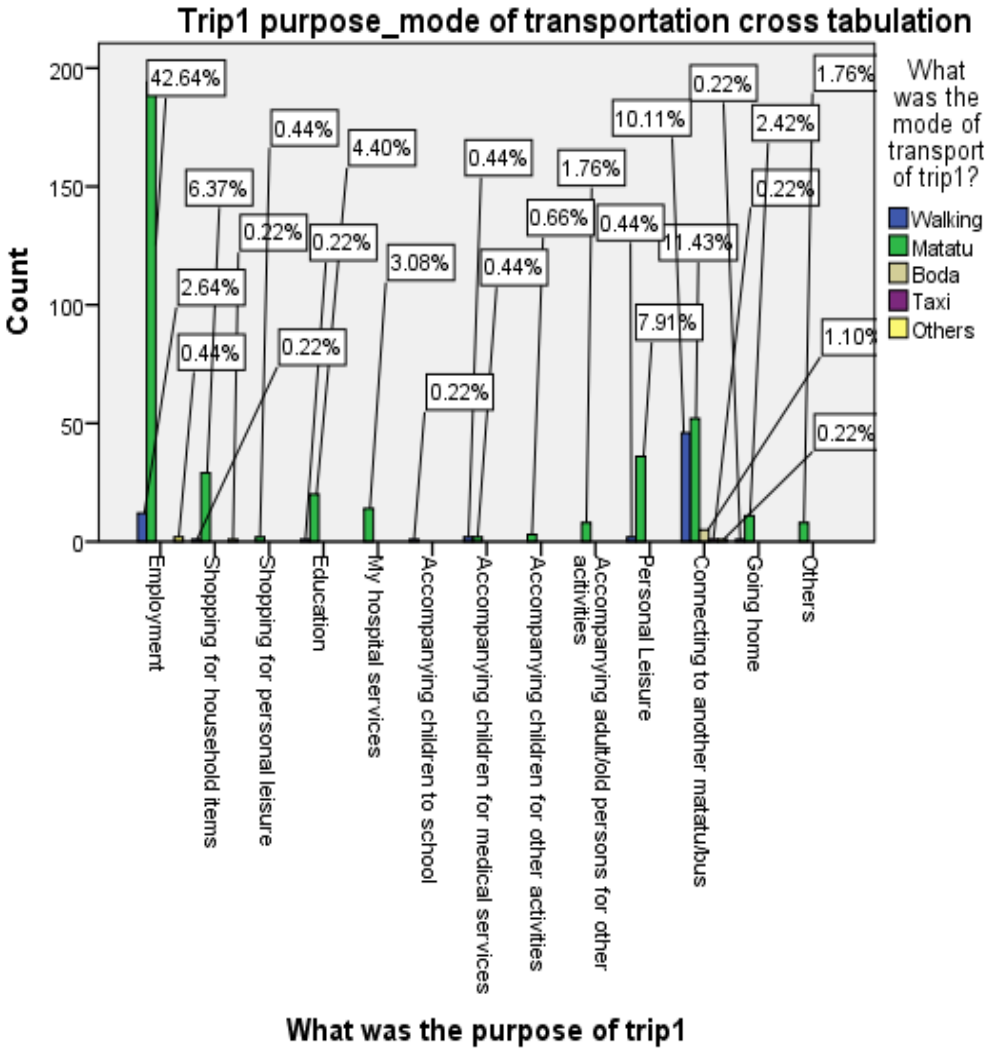

Figure 12: Purposes of Trip 1 for survey respondents

The main purpose of the second trip for both men and women was employment (Table 8; Figure 13). The percentage was higher for men than for women, as over half of men declared employment to be the purpose of their second trip, with only one third of women did so. The next purpose of the second trip in order of importance was for women other (not specified). This is the again the case for men although is a significant smaller proportion. The remaining purposes of the second trip - shopping for household items, shopping for personal leisure, education, health services, accompanying children to medical services and other activities, and accompanying elderly persons to other activities – pertained more to women than to men.

Table 8 Gender Cross Tabulation - Purpose of Trip 2

What was the purpose of trip 2? * Respondents Gender Cross Tabulation				
Count				
		Respondents Gender		Total
		Female	Male	
What was the purpose of trip2	Employment	48	24	72
	Shopping for household items	7	0	7
	Shopping for personal leisure	5	0	5
	Education	12	2	14
	My hospital services	2	1	3
	Accompanying children to school	1	1	2
	Accompanying children for medical services	1	0	1
	Accompanying children for other activities	6	0	6
	Accompanying adult/old persons for other acitivities	6	0	6
	Personal Leisure	15	3	18
	Connecting to another matatu/bus	10	1	11
	Going home	13	4	17
	Others	4	0	4
Total		130	36	166

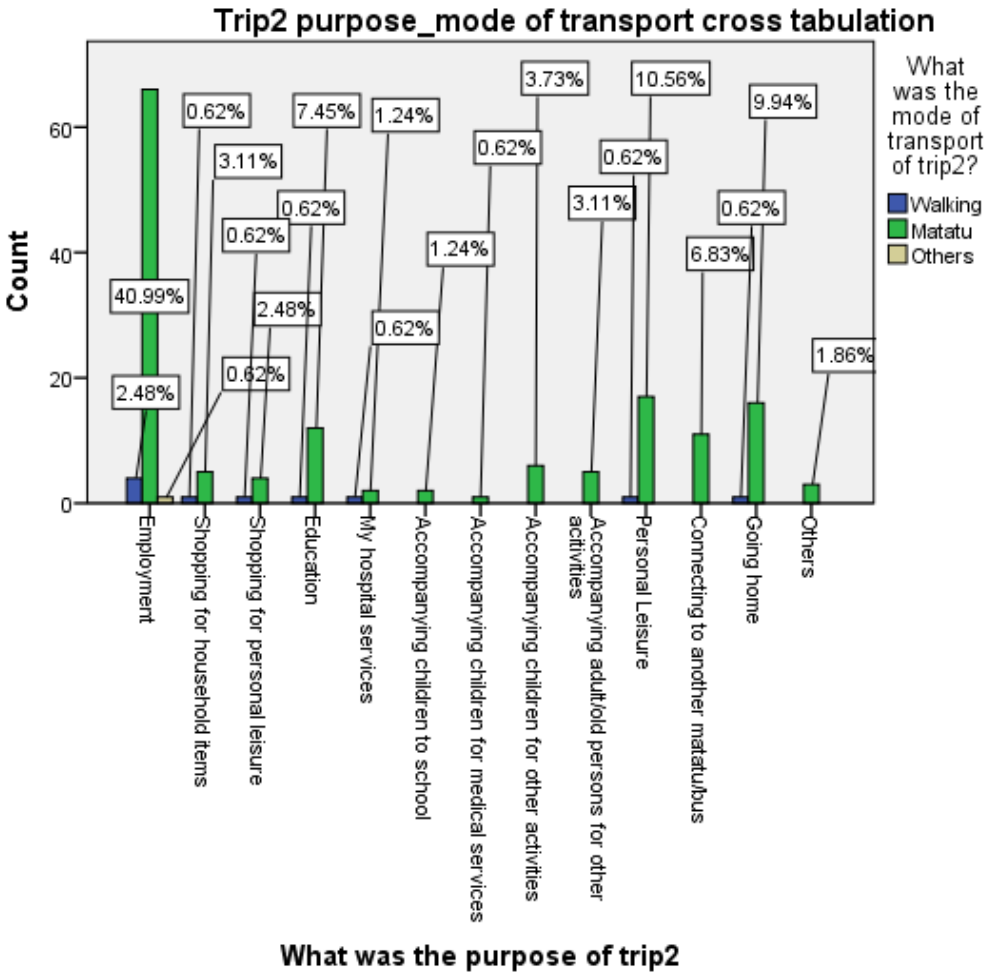

Figure 13: Purposes of Trip 2 for survey respondents

The purpose of the third trip was still mainly employment, followed by other purposes (category "other") (Table 9; Figure 14). The purposes of the third trip were for women, who are the ones who mainly did this third trip, more than men), shopping, education, accompanying children and elderly persons, among other purposes.

Table 9: Gender Cross Tabulation - Purpose of Trip 3

What was the purpose of trip3 * Respondents Gender Cross tabulation				
Count				
		Respondents Gender		Total
		Female	Male	
What was the purpose of	Employment	12	2	14
	Shopping for household items	2	0	2

trip3?	Education	2	0	2
	My hospital services	1	0	1
	Accompanying children for other activities	3	0	3
	Accompanying adult/old persons for other activities	2	0	2
	Personal Leisure	3	0	3
	Connecting to another matatu/bus	1	0	1
	Going home	6	3	9
Total		32	5	37

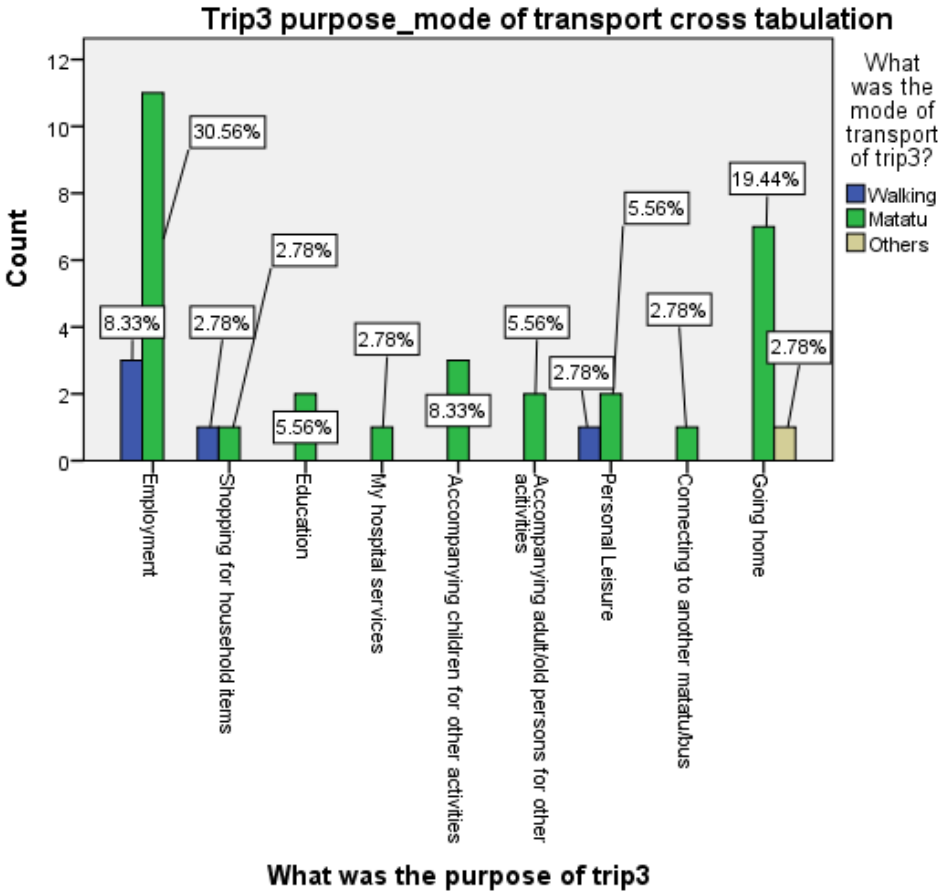

Figure 14: Purposes of Trip 3 for survey respondents

The duration of the first trip, when it was made on foot, was of between 5 and 10 minutes. For matatu trips these first trips were in between half an hour (in most cases) and one hour. The second trip was not done on foot, but matatu, with

durations of around 30 minutes. Except on rare occasions the third trip was done also on foot, and was between 15 and 30 minutes long. The preferred transportation mode for the sample population was matatu/bus (83.2%), followed by taxi and walking (5.4% and 3.9% respectively) (Figure 15).

4.7 Motivation for choosing transport modes

Regarding motivation for choosing transport modes, women who did trips on foot pointed out to health issues as the reason for walking.

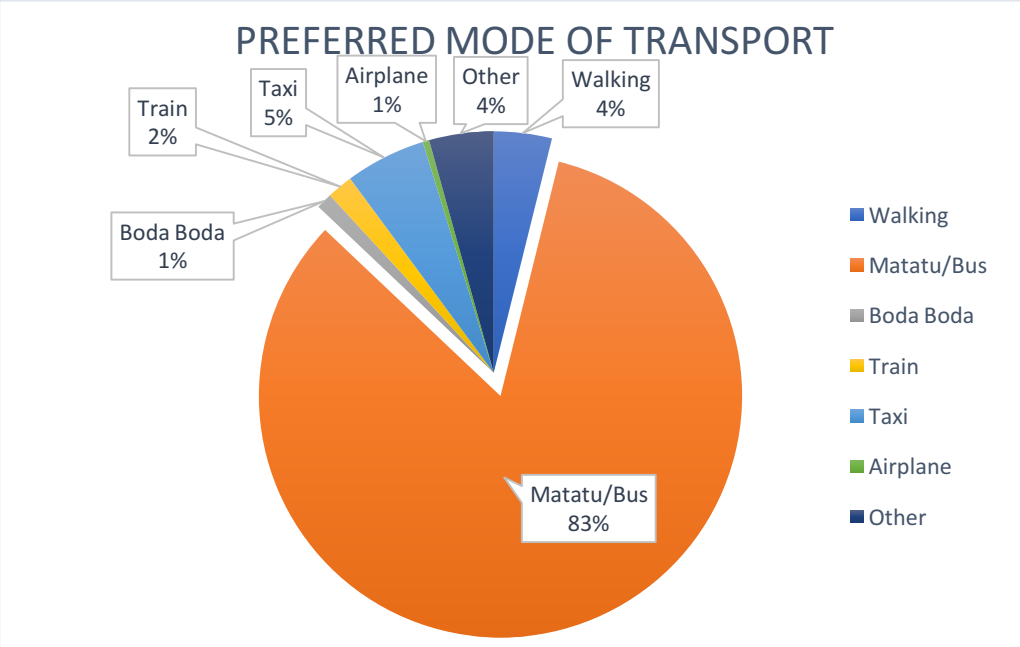

Figure 15: Preferred modes of transport of survey respondents

Those women who chose matatu/bus did so mainly based on affordability, reliability, accessibility, safety and velocity reasons. Men chose this transportation mode based on reasons of affordability followed by accessibility and convenience. Very few men pointed out to safety as a reason. More women than men preferred trains, and they accredited this to affordability and comfort. Women chose taxis because of convenience and, more importantly, for safety reasons. Airplanes had been used by few respondents, and those who had pointed to velocity as the reason. The main motivations for selecting transport modes for both male and female survey respondents are detailed in Table 10 and Figure 16.

Table 10: Gender Cross Tabulation – Motive Behind Preferred Mode of Transport

Why that mode of transport * Respondents Gender Cross Tabulation				
Count				
		Respondents Gender		Total
		Female	Male	
Why that mode of transport	Affordable	95	110	205
	Efficient	0	8	8
	Convenient	29	15	44
	Safety	22	3	25
	Accessibility	51	36	87
	Comfort	18	6	24
	Reliability	19	2	21
	Type of work	2	0	2
	Health	12	1	13
	Fast	17	4	21
	No choice	3	2	5
	Company	2	1	3
	Flexibility	1	0	1
	Graffiti	0	1	1
Total		271	189	460

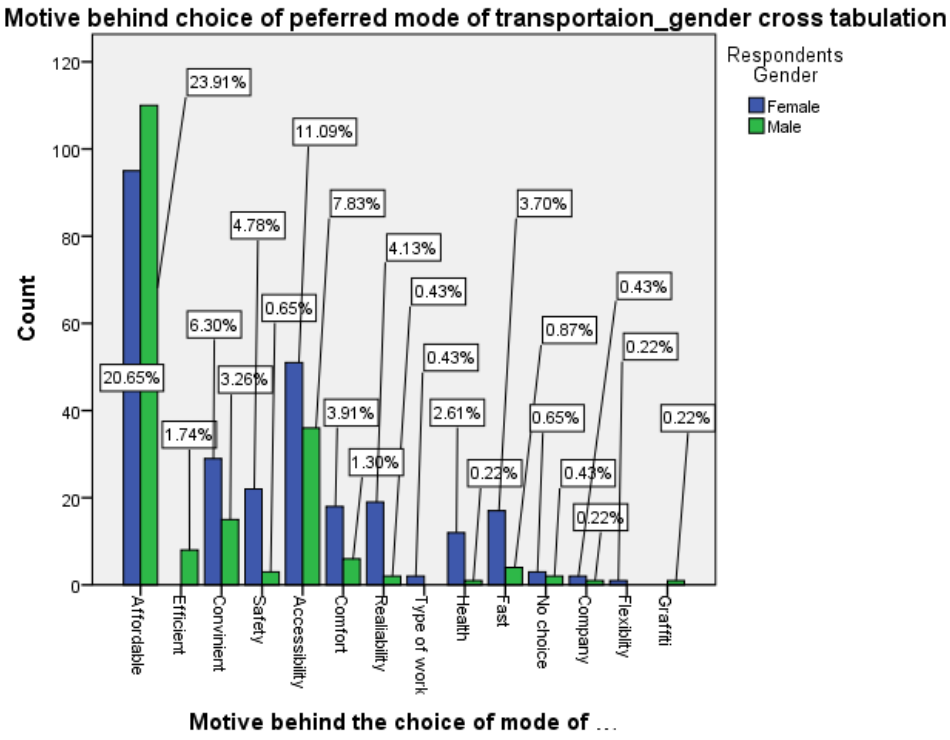

Figure 16: Motivations for choosing transport modes for survey respondents

4.8 Perceived Safety / Unsafety as Motivation for Choosing Transport Modes

When asked whether safety had been taken into account when choosing the matatu as transport mode, 40.88% of women responded yes, while 59.12% of women said no (Figure 17). The percentage of men who said they had taken into account safety concerns was significantly higher, representing 44.97% of cases.

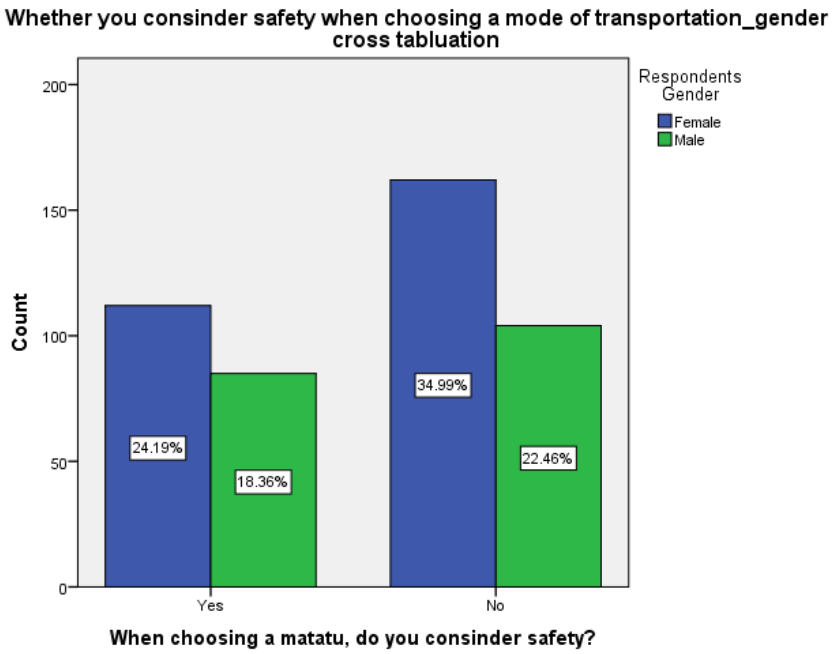

Figure 17: Considerations of safety when selecting a mode of transportation

Among those who did not travel in the sample, 17.94% of women declared they did not travel for fear of sexual assault, with not one single man saying the yes to this question (Table 11; Figure 18). Up to 37.67% of women cited general safety issues. The percentage of men pointing out to general safety concerns was below half that percentage; less than 15.32% of men. Some women, 4.93% of the total, and no men, indicated the absence of lighting as the reason; and very few indicate the reason is absence of transportation. A significant percentage of women, up to 8.52%, compared with 2.68% of men declared they did not travel because they were overwhelmed with household chores. On the other hand,

39.19% of women and 63.16% of men, showing in this case a great difference, said they did not travel because they did not have errands to do.

Table 11: Gender Cross Tabulation – Fear of Sexual Harassment as a Determinant of Travel

Reasons for traveling/or not traveling based on sex**; If not traveling, is it because of fear of sexual harassment? * Respondents Gender Cross Tabulation**				
Count				
		Respondents Gender		Total
		Female	Male	
If not is it because of fear of sexual harassment?	Yes	40	0	40
	No	183	110	293
Total		223	110	333

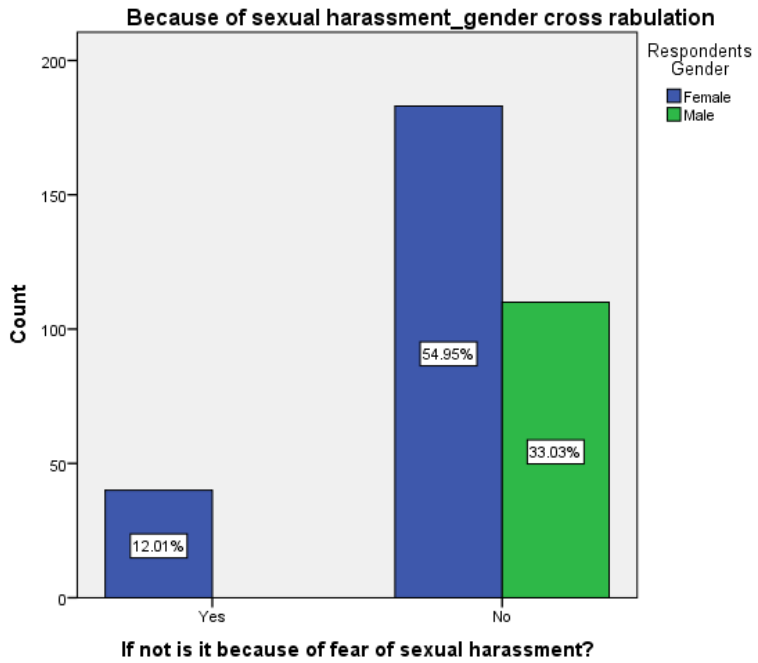

Figure 18: Fear of sexual harassment as a motivation for not travelling

With respect to the time of travel, 27% of women indicated they did not travel or do any task outside of the home at night, while more than half the men do so (51.85%) (Table 12; Figure 19). Half of those who travelled at night were employed, which suggest employment is a major purpose for night travel.

Table 12: Gender Cross Tabulation – Do you travel after dark?

Do you travel or do tasks outside the house after dark? * Respondents Gender Cross Tabulation				
Count				
		Respondents Gender		Total
		Female	Male	
Do you travel or do tasks outside the house after dark?	Yes	75	98	173
	No	202	91	293
Total		277	189	466

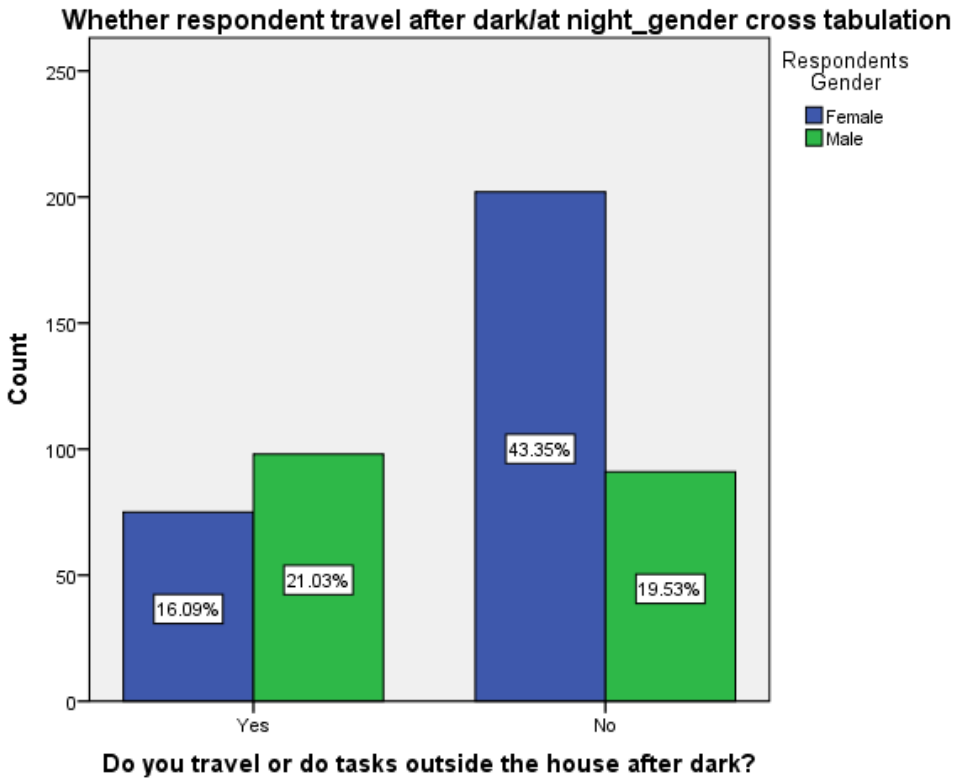

Figure 19: Frequency of night travel among survey respondents

CHAPTER 5: DISCUSSION AND CONCLUSIONS

The analysis of the mobility patterns of women and men users of the matatu system in Nairobi shows significant differences related to key concerns for women's mobility. These differences confirm patterns identified in other cities and countries. They are mostly related to care activities, alternative access to private cars, number of trips, purposes of trips, and perceived safety.

Women were a majority among users of the matatu system. This confirms a widespread reality around the world, that is, that women are a majority among those who rely on public transportation means, while men have priority access to the car when there is one in the household.

Some socio-economic variables suggest that women in both the higher end of the social spectrum and in the lower end are disproportionately forced to use the public transportation system. The percentage of women at both the lower and the higher educational levels doubled that of men, suggesting various possible explanations. On the one hand, women are the majority among those self-employed, which probably involves lower salaries and more precarious jobs. On the other, that education does not guarantee access to sufficient economic means for an additional car in the house to be used by the woman.

Women make more trips per day than men. For many women, this additional trip corresponds to a segment in a longer trip for which they need to take more than one transportation mode or more than one bus line. The purpose of the trips done by men and women shows that the additional trip done by women corresponds to one of the following:

⇒ a segment of a trip involving two different transport modes or bus lines, meaning women users of the matatu system have longer distances to travel than men and/or the spatial scope of their travel is not covered by one single bus line, requiring them to transfer;

⇒ one trip doing some care task (whether related to the home or to dependents), done before going to work or after going to work and before going back home.

Another conclusion is that the length of the trips done by women for care purposes using the matatu system do not seem to be much shorter than trips done for the purpose of employment.

A significant number of women do not travel because of safety concerns. Many people both men and women have safety concerns, but it is women who are concerned about sexual assault. It is relevant to see that men are also concerned about safety, albeit not of a sexual nature. Men's safety concerns need also be taken into account in transportation policies. Despite safety concerns, many women still travel at night. The fact that many such trips are related to employment suggests that people are forced to travel at night mostly because of employment.

CHAPTER 6: RECOMMENDATIONS

Because of all of the above, the matatu system should pay specific attention to the travel needs of women, who are their main users. The main actions to be taken should relate to both safety and care issues.

6.1 Improving Safety in the Matatu System

The following are actions that could be taken to improve safety in the Nairobi public transport system:

- ⇒ Increase the participation of women at all levels and in all types of employment in the transport sector
- ⇒ Train managers, drivers and other workers in the *matatu* system on issues related to safety, harassment and other sexual misconduct.
- ⇒ Improve the design of buses, stops and stations
- ⇒ Provide clear signs showing where to go
- ⇒ Improve lighting in buses and stops and around the stops
- ⇒ Adopt anti-harassment policies in SACCO's
- ⇒ Adopt charters for proper behaviour of *matatu* workers and users, clearly visible, with simple understandable language and attractive visuals.
- ⇒ Do public educational campaigns on the importance of violence-free transportation systems

6.2 Supporting the Mobility of Care

The mobility of care can be supported on public transport systems in various ways:

- ⇒ Provide support for women travelling with shopping bags or accompanying children through a number of actions geared at better design of buses to accommodate for encumbered persons and design of stops.

⇒ Study the adequacy of the layout of main lines to the travel needs of those, mainly women, who do transfers. Are those layouts responding to the needs of women and men equally? Are there better options to cater to the travel needs of those who today are forced to transfer?

⇒ Study the adequacy of the layout of lines to the travel needs of care activities as they intersect with employment. Are the lines layouts considering the travel needs of those persons doing an additional trip per day which was not motivated by employment? Can the lines layouts be better adapted to those non-employment related travel needs?

⇒ Identify any sections of the city that not sufficiently served by the matatu system that would provide better service for the women users who do this additional trip per day, whether it is a connection trip or whether it is for some care related purpose

⇒ Consider the integration of supplementary transportation modes (taxis, shared cars, etc.) with the Matatu system to better cater for the persons who do more than to trips per day

Recommendations based on these research findings are available in greater detail in the Gender Sensitive Mini-Bus Services and Transport Infrastructure for African Cities Toolkit. The toolkit provides specific recommendations for various stakeholders including managers of public transport service providers (buses and minibuses), city officials, civil society actors and other stakeholders in urban public transport.

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APPENDIX A: TABLED SURVEY RESULTS

1. Transport

Table 13: Drivers of cars in respondents' households

Who drivers the car if there is car in the household * Whether there is a car in the household * Respondents Gender Cross Tabulation					
Respondents Gender				Whether there is a car in the household	Total
				Yes	
Female	Who drivers the car if there is car in the household	Spouse	Count	20	20
			% within Whether there is a car in the household	36.4%	36.4%
		Father	Count	15	15
			% within Whether there is a car in the household	27.3%	27.3%
		Sister	Count	3	3
			% within Whether there is a car in the household	5.5%	5.5%
		Brother	Count	3	3
			% within Whether there is a car in the household	5.5%	5.5%
		Mother	Count	2	2
			% within Whether there is a car in the household	3.6%	3.6%
		Driver	Count	3	3
			% within Whether there is a car in the household	5.5%	5.5%
		Myself	Count	6	6
			% within Whether there is a car in the household	10.9%	10.9%
		Children	Count	2	2
			% within Whether there is a car in the household	3.6%	3.6%
		Uncle	Count	1	1
			% within Whether there is a car in the household	1.8%	1.8%
	Total		Count	55	55
			% within Whether there is a car in the household	100.0%	100.0%
Male	Who drivers the car if there is car in the	Spouse	Count	2	2
			% within Whether there is a car in the household	6.5%	6.5%
		Father	Count	3	3
			% within Whether there is a car in the household	9.7%	9.7%
		Mother	Count	1	1
			% within Whether there is a car in the household	3.2%	3.2%

	household	Driver	Count	3	3
			% within Whether there is a car in the household	9.7%	9.7%
		Myself	Count	18	18
			% within Whether there is a car in the household	58.1%	58.1%
		Children	Count	3	3
			% within Whether there is a car in the household	9.7%	9.7%
		Uncle	Count	1	1
			% within Whether there is a car in the household	3.2%	3.2%
	Total		Count	31	31
			% within Whether there is a car in the household	100.0%	100.0%
Total	Who drivers the car if there is car in the household	Spouse	Count	22	22
			% within Whether there is a car in the household	25.6%	25.6%
		Father	Count	18	18
			% within Whether there is a car in the household	20.9%	20.9%
		Sister	Count	3	3
			% within Whether there is a car in the household	3.5%	3.5%
		Brother	Count	3	3
			% within Whether there is a car in the household	3.5%	3.5%
		Mother	Count	3	3
			% within Whether there is a car in the household	3.5%	3.5%
		Driver	Count	6	6
			% within Whether there is a car in the household	7.0%	7.0%
		Myself	Count	24	24
			% within Whether there is a car in the household	27.9%	27.9%
		Children	Count	5	5
			% within Whether there is a car in the household	5.8%	5.8%
		Uncle	Count	2	2
			% within Whether there is a car in the household	2.3%	2.3%
	Total		Count	86	86
			% within Whether there is a car in the household	100.0%	100.0%

2. Trips and Distances

Table 14: Gender Cross Tabulation - Duration of Trip 1

Trip1 duration in mins * Respondents Gender Cross tabulation			
Count			
	Respondents Gender		Total
	Female	Male	

Trip1 duration in mins	1 - 20	83	45	128
	21 - 40	86	115	201
	41 - 60	77	22	99
	61 - 80	1	0	1
	81 - 100	2	4	6
	over 100	19	3	22
Total		268	189	457

Table 15: Gender Cross Tabulation - Duration of Trip 2

Trip 2 Duration in Mins * Respondents Gender Cross Tabulation				
Count				
		Respondents Gender		Total
		Female	Male	
Trip2 duration in mins	1 - 20	23	13	36
	21 - 40	62	15	77
	41 - 60	27	3	30
	61 - 80	2	0	2
	81 - 100	5	0	5
	over 100	3	5	8
Total		122	36	158

Table 16: Gender Cross Tabulation - Duration of Trip 3

Trip 3 Duration in Mins * Respondents Gender Cross Tabulation				
Count				
		Respondents Gender		Total
		Female	Male	
Trip3 duration in mins	1 - 20	17	1	18
	21 - 40	10	4	14
	41 - 60	3	0	3
	over 100	2	0	2
Total		32	5	37

APPENDIX B: MOBILITY OF CARE SURVEY QUESTIONNAIRE

SECTION I) Survey Administration information

Survey Number		Date *(dd|mm|yyyy)*			
Geographical Area		Time started *(24 hrs)*			
Was survey completed?	☐ Yes ☐ No	Time ended *(24hrs)*			
Enumerator name					

SECTION II) Demographic Information

(Please see the codes representing level of income, purpose of travel and age range at the end of this section)

Age (*write a number/code representing age group)*			Gender M/F	☐ Male ☐ Female	
level of Education (code)			Is there a car in your HH	☐ Yes ☐ No	
If Yes who drives it?			When do you drive it?		
Size of HH (how many are you in your household)			How many people are employed in your HH		
Employed?	☐ Yes ☐ No	Type of Employment ☐ Self Employment ☐ Employed by others	*If employed by Others*; what's mode of employment	☐ Part time ☐ Fulltime	
Marital status	☐ Divorced ☐ Married/Remarried ☐ Separated ☐ Single	Are you the head of your HH?	☐ Yes ☐ No	If No, who is	☐ Father ☐ Mother ☐ Spouse ☐ Other guardian
What is your average monthly income (in Shs)	☐ Less than10000 ☐ 10001 - 20000 ☐ 20001- 30000 ☐ 30001 – 40000 ☐ 40001 - 50000 ☐ 50001 - 60000 ☐ 60001 - 70000 ☐ 70001 – 80000 ☐ 80001 - 90000 ☐ 90001 - 100000 ☐ 55001 - 60000 ☐ Above 100,000	What is the main reason you choose to live in that particular neighborhood?	☐ Lower crime rate ☐ Low rent (Affordability) ☐ Great schools ☐ Access to medical care ☐ Outdoor activities bound ☐ My family members are around family friendly ☐ Close to public transport ☐ Nearby shopping and restaurant ☐ Nightlife and entertainment ☐ Walk -ability ☐ Others		
Number of the children below 18 yrs under your care in the HH		Number of male child(ren)			
		Number of Female child(ren)			

Pg1

Code list

Level of education

1. *No formal Education*
2. *Primary Education*
3. *Incomplete Secondary Education (incomplete high school)*
4. *Complete secondary education (complete high school)*
5. *Certificate education*
6. *Diploma Education*
7. *Degree/bachelors education*
8. *Post graduate education*

Age ranges (5years range)

1. *Below 18yrs*
2. *18- 22 yrs*
3. *23 - 27 yrs*
4. *28 – 32 yrs*
5. *33 – 37 yrs*
6. *38 – 42 yrs*
7. *43 – 47yrs*
8. *48 – 52 yrs*
9. *53 – 57 yrs*
10. *58 – 62 yrs*
11. *63 – 67 yrs*
12. *68 yrs and above*

Purpose of travel

1. *Employment*
2. *Shopping for household items*
3. *Shopping for personal leisure*
4. *Education (primary, secondary, university)*
5. *My hospital services*
6. *Accompanying children to school*
7. *Accompanying children for medical services*
8. *Accompanying children to other activities*
9. *Accompanying an adult/older persons for other activities*
10. *Personal leisure (drinks,, sport,..)*
11. *Other; Specify*

Pg2

A) ***(NB, first part of section iii to be inserted above when printing)***

B) Are there things you did not do, or places you did not go, for one or more of the following reasons? What are these places you did not go, and things you did not do?

1. Too distant (far) ( ) Yes ( ) No
2. Affordability ( ) Yes ( ) No
3. No transportation available ( ) Yes ( ) No
4. It was raining ( ) Yes ( ) No
5. There is no lighting ( ) Yes ( ) No
6. Fear of sexual harassment ( ) Yes ( ) No
7. General safety issues ( ) Yes ( ) No
8. Other reasons ( ) Yes ( ) No. If Yes, Specify _____
9. Does this happen frequently, or is it exceptional that you cannot go to a place you need, want, or should go?
   ( ) Yes ( ) No

C) Are there places you need to go regularly and you do not dare to go alone, and you only go when somebody else can go with you?

( ) Yes ( ) No

1. What daily tasks outside of the home do you do MOST days?
   - ( ) Go to school
   - ( ) Go to work
   - ( ) Go to see a doctor
   - ( ) Go to church
   - ( ) Go to the market
   - ( ) Go to the shop
   - ( ) Recreational Activities (outing/gym/….)
   - ( ) others; Specify _____

     _____

2. What did you do this PAST WEEKEND?
   - ( ) Go to school
   - ( ) Go to work
   - ( ) Go to see a doctor
   - ( ) Go to the market
   - ( ) Go to Church
   - ( ) Go to the shop
   - ( ) Recreational Activities (outing/gym/park….)
   - ( ) others; Specify _____

Pg4

     _____

3. Do you travel or do tasks outside the house after dark?

   ( ) Yes ( ) No

   If Yes, What tasks

   _____
   _____
   _____
   _____
   _____
   _____

   If Not, why not *(e.g. fear of sexual harassment, fear of theft, no lights,* …….?
   - ( ) Fear of sexual harassment
   - ( ) I have no errands at night
   - ( ) General safety issues
   - ( ) No lights
   - ( ) No means of transport at night
   - ( ) Overwhelmed by family chores at home (taking care of family at home)
   - ( ) Others; Specify _____

     _____

4. What is your preferred mode of transportation (matatu, bus, boda, taxi, walking) and why?
   - ( ) Walking Why? _____
   - ( ) Matatu Why? _____

( ) Boda Why? _____
( ) Train Why? _____
( ) Bicycle Why? _____
( ) Taxi Why? _____
( ) Airplane Why? _____

( ) Other; Specify _____ Why? _____

5. If you use matatus regularly, how do you choose which matatu you ride (do you consider lighting, music, size, etc.)?
   ( ) Size
   ( ) Graffiti/Color
   ( ) Music system
   ( ) Safety
   ( ) Reliability (time)

Pg5

   ( ) No any considerations (as far as there is a matatu on stage)
   ( ) Others; Specify _____
   _____

6. Are you responsible for taking care of anyone? (Family members or friends)

   ( ) Yes ( ) No

   If Yes, explain
   _____
   _____

7. Do you have children,

   ( ) Yes ( ) No

   If Yes, do you take them with you when you're doing your tasks?

   ( ) Yes ( ) No

Does the way you travel change when you are traveling with children?

   ( ) Yes ( ) No

8. a) Do you work *(any form of employment including self employment)*

   ( ) Yes ( ) No

   b) Who looks after your child when you are working?
   ( ) Day care
   ( ) Friends
   ( ) Spouse
   ( ) Other relatives
   ( ) Neighbour
   ( ) Go with them to work
   ( ) Others; Specify _____

   c) Do you have to drop them off and/or pick them up before and after work?

   ( ) Yes ( ) No

Pg6

SECTION III) Mobility pattern information

Questions to ask for each of the trips made the <u>previous day</u>. Please tell them to describe all trips even those close to the home or the workplace on foot. Put a ***number*** *to each of the trips made by one person.*

D) In the past ONE day did you travel? *(Either walking or by other means)*
( ) Yes ( ) No

If **Yes**,

1) From where to where , how many times *(write a number (#) on how many times the trip was made*		2) Mode of transport (matatu, boda, tuktuk, ….)	3) How long (mins)?	4) Were you accompanied by others, If **Yes specify** who (children, spouse, elderly person, friends colleagues)	5) What was the purpose of the trip (eg carrying kids to school, connecting to another matatu,	6) What is the purpose of travel?
a) Trips	b)Number of times					
				( )Yes ( )No _____		
				( )Yes ( )No _____		
				( )Yes ( )No _____		
				( )Yes ( )No _____		
				( )Yes ( )No _____		
				( )Yes ( )No _____		

Pg3