

**WOMEN'S URBAN SPATIAL MOBILITY:  
FEMALE DRIVERS IN JEDDAH CITY**

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**by**

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## **ABSTRACT**

### **WOMEN'S URBAN SPATIAL MOBILITY: FEMALE DRIVERS IN JEDDAH CITY**

This study examines the socio-spatial factors that impact female drivers in terms of spatial mobility and city experience, as well as the characteristics of their spatial mobility. Women's spatial mobility tend to be family-oriented, shorter in distances, longer in time, multi-chained, and they tend to depend more on public transportation. Gender roles and safety are two main starting point in understanding the nature of women's spatial mobility in the city. There are three factors that influence women's spatial mobility: individual-related factors, social-related factors, and political related factors. Women who are older in age, married with at least one dependent child, have lower education, unemployed, and come from lower income household have less spatial mobility and overall city experience. Other political factors such as laws and regulations, and the lack of female participation in transportation and urban planning and academic studies play a critical role in hindering women's spatial mobility.

This aim of this research is to investigates two main aspects of women's spatial mobility. The first aspect is to investigate the social and individual factors that impact her likability to drive her own car or to travel with other public transportation. The second aspect is the impact of gender role and the presence of at least one dependent child on the the characteristics of spatial mobility for women who drive/travel. This study is developed using a case study on female drivers and travelers from Jeddah City, Saudi Arabia. Jeddah was chosen as a new emergent case in the literature review. This study will include conducted surveys with 100 women who drive and women who travel, with or without at least one dependent child.

## ÖZET

### KADINLARIN KENTSEL MEKANSAL HAREKETLİLİĞİ: CİDDE ŞEHRİNDE KADIN SÜRÜCÜLER ÖRNEĞİ

Bu çalışma, kadın sürücülerin mekândaki hareketliliği ve şehir deneyimini etkileyen sosyo-mekânsal faktörlerin yanı sıra mekânsal hareketlilik özelliklerini de incelemektedir. Kadınların mekânsal hareketliliği çoğunlukla aile odaklı, kısa mesafeler arası, zaman açısından daha uzun süren, çok zincirli olma ve daha çok toplu taşımaya bağımlı olma eğilimindedir. Toplumsal cinsiyet rolleri ve güvenlik, kadınların kentteki mekânsal hareketliliğinin doğasını anlamada iki temel başlangıç noktasıdır. Kadınların mekânsal hareketliliğini etkileyen üç faktör vardır. Bunlar bireysel, sosyal ve politik odaklı faktörlerdir. Yaşı daha büyük, evli, en az bir çocuğu olan, eğitim düzeyi yetersiz, işsiz ve düşük gelirli hanelerden gelen kadınlar daha az mekânsal hareketliliğe ve ilgili olarak şehir deneyimine sahiptir. Başta kanun ve yönetmelikler gibi diğer politik faktörler de olmak üzere kadınların kent ulaşımına, şehir planlaması ve akademik çalışmalara katılımının olmaması, kadınların mekânsal hareketliliğini engellemede kritik bir rol oynamaktadır.

Bu araştırmanın amacı, kadınların mekânsal hareketliliğinin iki temel boyutunu incelemektir. İlk boyutta, kadının kendi arabasını sürmeyi veya diğer toplu taşıma araçlarıyla seyahat etmeyi sevmesini etkileyen sosyal ve bireysel faktörleri araştırılmaktadır. İkinci boyutta ise cinsiyet rolünün ve en az bir çocuğunun olmasının, araba kullanan/seyahat eden kadınlar için mekânsal hareketliliğin özellikleri üzerindeki etkisi incelenmektedir. Bu çalışma, bir alan çalışması olarak Suudi Arabistan'ın Cidde şehrinden kadın sürücüler ve yolcuları incelemek üzere geliştirilmiştir. Çalışma alanı olarak, literatür taramasında yeni gündeme gelen ve kendinden sıkça söz edilen Cidde şehri seçilmiştir. Ayrıca çalışma, en az bir çocuğu olan veya hiç çocuğu olmayan, araba kullanan ve seyahat eden 100 kadınla yürütülen anketleri de içermektedir.

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# CHAPTER 1

## INTRODUCTION

This thesis aims to examine the spatial mobility of women who either drive their own car or travel with other transportation means. It investigates women's spatial mobility according to two aspects. The first aspect is the socio-spatial factors that impact their tendency to drive or to travel by another means. The second aspect is the characteristics of spatial mobility between women who drive and women who travel by other means. Gender role will be considered as an influencer on spatial mobility by taking in consideration the availability of at least one dependent child or not.

It will be done with a case study based on a two methods: a conducted survey with 100 women, as well as an online interview with 6 women from Jeddah city, Saudi Arabia. Spatial mobility is the physical movement from one point to another, and it is positively associated with freedom of movement and the pursue of purposes (Hanson, 2010). Spatial mobility is important to all, but specially for women as they usually have higher responsibility of both household-related responsibilities and her professional life responsibilities. Women who have higher accessibility to different and further employment locations have better chance to get larger opportunities that enhances their life quality on the economic, social, and health level (Chant ,2013).

However, men and women have differences in spatial mobility patterns and behaviors. They have differences in experiencing the city. Differences in spatial mobility include trip purpose, travel distance and time, number of trips, multi-chaining, repetitive and familiarity of places, and mode of travel. Three socio-spatial factors impact women's spatial mobility: individual-related factors such as age, marital status, education, income and employment, social and cultural background, Social-related factors such as gender roles, and political-related factors such as laws and regulation, gender biases in urban planning practices and academic urban studies. Differences in experiencing the city also

include concerns of personal safety and sexual harassment (Beebeejaun, 2016, Gauvin et al, 2019, and Aldosary, 2017).

This study is developed using a case study in Jeddah City, Saudi Arabia with a face to face survey and online interviews with women who have driving licenses and women who don't have a driver license, and are aged between 18 – 60 years old. The respondents are chosen from one main location from Jeddah: the waterfront. The location was chosen because it is considered the go-to destination for leisure and entertainment for women and families in Jeddah. It is the main location for international and national events and cultural activities. The Waterfront is considered one of the first formal public spaces to be established in Jeddah city. Unfortunately, the culture of public spaces in Jeddah was not provided before the opening of the waterfront, as most leisure and entertainment locations were paid or private.

To find out what are those factors and their characteristics, this research develops with the following questions:

- What are the differences in spatial mobility among women who have driving license and women who travel by other transportation means?
- What are the individual and social factors related to women who have more spatial mobility's than others?
- What is the impact of gender roles on the spatial mobility for women who drive or travel by other means?
- How did the spatial mobility change for women who gained their driving license and started driving their own cars?

Those questions are answered through literature review and the information derived from the field work surveys. Accordingly, this study develops the following hypothesis:

- Women who drive tend to go for further distances to their work, spend shorter commuting time, spend less on monthly transportation, have more frequent leisure and entertainment trips, have more frequent household-related trips, and have more stops on their way to/from work.
- Women who drive tend to be in. middle age, have higher salary, and higher educational degree, than women who travel by other means.

- Gender roles influence the characteristics of women's spatial mobility, women who are divorced/widowed and have at least one dependent child tend to have better spatial mobility than women who are married.
- Women who drive tend to be exposed to less sexual harassment and tend to express more feelings of security than women who travel by other means.

This study is developed using a case study on a sample of employed women with driving license and without driving license between the age 18 - 60 in Jeddah City, Saudi Arabia. The study will depend on a survey with 18 closed-ended questions, and it targets women who have driving license. The survey took place in the most popular public space in Jeddah: the waterfront. The location was selected because it is the main leisure and entertainment destination for women in Jeddah, and it will be easier to approach them and conduct the survey. The other method was an online conducted survey with 6 women who gained their driving license. The interview aims at exploring the differences in the spatial mobility of those women before and after their ability to drive.

## **CHAPTER 2**

### **LITERATURE REVIEW**

#### **2.1. Spatial Mobility and Gender**

##### **2.1.1. Defining Accessibility**

There is a difference between accessibility and mobility. Accessibility is the quality of travel and takes place at the community and individual level through Access Management techniques to provide access to various land uses. It focuses on travel time, travel cost, travel options, comfort, and risk while addressing the needs of all within the community. Mobility and accessibility are considered the “ying and yang” of transportation. The goal is to increase the overall capability of the transit system while not compromising efficiency and ease of access (Litman, 2021). As accessibility improves people tend to access more opportunities. The demand on accessibility increases with the factors such as Attending school, being employed, or having dependents increases demand. Price, quality and other factors affect demand for each mode and therefore mode split. (Woldeamanuel, Mintesnot & Cyganski, Rita. (2012). According to (Litman, 2021), accessibility refers to people’s overall ability to reach desired services and activities (together called opportunities), and therefore the time and money that people and businesses must devote to transportation. Accessibility is the ultimate goal of most transportation planning. Several factors can affect this accessibility:

- Mobility. The ease of physical movement, and therefore the quality (availability, frequency, speed, comfort, etc.) of travel modes (walking, bicycling, taxis, public transport, air travel, etc.).

- Geographic proximity. The distances between destinations, and therefore land use development factors such as development density and mix, which affect these distances.
- Transport system connectivity. This can include the density of sidewalk, road and public transit networks, and the quality of connections between modes, such as transit station bike parking, and transit connections to airports.
- Affordability. This refers to the financial costs of travel relative to users' income
- Convenience. The ease of obtaining travel information, paying fares and carrying luggage.
- Social acceptability. The ability to use a mode sometimes depends on its social status.

### **2.1.2. Defining Mobility**

The concept of mobility can be defined as the “movement of people and goods from one point to another over a span of short or long time” (Hanson, 2010). Spatial Mobility can be used to describe trips, travels, commuting, migration in terms of individual motivation, physical span, and temporal duration (Recchi et al., 2019). Mobility can be positively associated with freedom of movement and the pursue of purposes (Shaw & Viswanath, 2013). Hegel argues that mobility is a basic right, he demonstrates that “*it is a violation of my natural essential freedom not to be able to go where I please*” (Benard and schlaffer, 1984, as cited in Shaw & Viswanath, 2013). According to (Tiwari, 2014 as cited in Vasudevan, 2019) the ability to spatially travel can be perceived positively by associated with accessibility to work and education opportunities. It can also be perceived negatively as the amount of movement consumes resources such as time and money.

The studies on mobility, spatial mobility, and movement during the 20<sup>th</sup> century gained little interest in the field of transportation and sociology. It has mainly focused on the technological and infrastructural aspect of mobility and has neglected the social aspect of it. Furthermore, the term of spatial mobility has always been focusing on answering the mere question of who travels and why, without a comprehensive understanding of the accompanying motivations and reasons for these travels. Yet, in the past few decades, the understanding of “mobility” has become an essential concept in the academic research,

especially in the field of Geography (Kwan et al., 2016; Recchi et al., 2019; and La Rocca, 2010). With the beginning of the 21st century, the study of mobility expanded and became more interrelated as researchers started to contextualize their studies and relate it with other disciplines. They tried to understand the real motivations of mobility and how is it practiced in the society. The field of mobility is both a contextualized and an interdisciplinary one. The contextualization of the knowledge of mobility takes in consideration the social, cultural and geographical within a specific time and place. The knowledge of mobility is also an interdisciplinary one, as it requires different point of views of other social and scientific fields. (Kwan et al., 2016; and Hanson, 2010).

### **2.1.3. Gender and Gender Roles**

One of the main dimensions that determines the extent of spatial mobility is gender (Hanson, 2010). Al-Rashid et al, (2020) indicates that “*gender is socially constructed*”. The definition of “gender” has multi-dimensional and intersectional aspects, it differs from place to place and from context to context, and sometimes it can hold different meanings within different groups of the same context, interpreting it can differ geographically, culturally, politically, and historically, it is continuously being remade at different scales, through national legislation, and changing life circumstances (Beebeejaun, 2016; Cresswell, & Priya Uteng, 2008). Hanson (2010), points out one perspective to perceiving gender: a socially-constructed and invented system that is flexible and prone to change according to context and time. Peake., (2009) perceives gender as an innate source of fixed and universal male/female difference that is determined, non-changeable, and naturalized.

Understanding gender roles is crucial to understand and realize the nature of women’s spatial mobility and experiences in the city (Abdelfattah, 2019). Perceived differences between genders manifests itself in different social tasks. Women were responsible for unpaid domestic work such as child care, cooking, cleaning, attending the husband and family members; which associated her to the indoor-home-family sphere. On the other hand, men were responsible for bread-brining, protecting, hunting, constructing, defending, and fighting to outdoor-wildness-bread-brining; therefore, they were associated with the outdoor sphere. Consequently, certain personal traits were associated with each gender; women were related with femininity, softness, being

protected, calm, sexual modesty, emotional intimacy, and passivity; while men were associated with masculinity, aggressiveness, physical strength, emotional restraint, assertiveness, boldness (Linda., 2009). These differences and tensions in the relation between men and women is considered as a *social fact*. Georg Simmel as cited in Bagnasco 1999, indicates that any social fact manifests itself as a spatial fact “*Sociological facts are formed spatially*”. These gendered responsibilities and personal traits (*Social facts*) constitutes the spatial practices, urban behaviors, spatial movement patterns, ordering of the space, social hierarchies, for both genders and constitutes how they represent themselves in the public (*spatial facts*). Gender roles impact the extent of women’s mobility, as well as her overall city experience (Cresswell, & Priya Uteng, 2008). Therefore, spatial mobility can be found to be associated with masculinity whereas immobility can be associated with femininity (Siwach, 2020).

Hanson,(2010), describes the relation between gender and spatial experiences as the following:

“... equates women and femininity with the home, the private, with domestic spaces and restricted movement (which translates into interactions that are routine, quotidian, familiar), and on the other, equates men and masculinity with the not-home, the public, with urban spaces and expansive movement (which translates into interactions that bring excitement, challenges, new experiences, encounters with the unknown”(Hanson, 2010).

It is also critical to point out that perceived distinctions between genders have always favored the male over the female, and have created a relation of domination and control practiced over women (Di Méo, G., 2012). Therefore, the city in its current design reflects a certain social power between the two genders; the oppressor and the oppressed, the controller and the controlled, the free and the constrained. The city is designed in way that keeps women under domination and as the “weakest social component” (Beebeejaun, 2016). Gendered urban policies and decisions contribute to the reproduction of power relations in space between genders (Gauvin et al, 2019). Siwach (2020) indicates that the most explicit representation of gendering of space is the division between public and private space. Public space—the space of transcendence, production, politics, and power—is the sphere of men, whereas private productive space—the sphere of reproduction—is the women’s space. Public spaces such as street, the café, the neighborhood, etc., are intentionally designed to reproduce and reinforce these social powers, economic paradigms, and social paradigms (Siwach, 2020). For example, the



shopping avenues in Beirut, Lebanon, is reflection for intentional existing spatial manifestations of gendered spaces through visual and sensual elements. The designs, the colors, the patterns, and the decorating elements suggest a certain male/female spatial identity. On one hand, reds, pinks, and flowery decorations are associated with the female users, and suggests that females are one homogeneous group of pink-loving women from all ages and from all backgrounds. On the other hand, blacks, metallic, blues, are associated with male users, and suggests that men are also a one homogeneous group of monolithic alpha-males who prefer urban rough-edgy designs (Nakhal, 2015).

## **2.2. Characteristics of the Spatial Mobility for Women**

The differences in gendered roles impacts the pattern of spatial mobility for men and women. Women's traditional role as a caregivers and men's traditional role as breadwinners shaped the pattern of their spatial mobility and the way they experience the city (Siwach, 2020). Women's traditional role as a mother and caregiver assigned her to the sphere of her house and its peripheries, her spatial movement have always been limited and confined to certain areas that are usually familiar, short-distanced, safe, defined, pre-defined, and known. On the other hand, the traditional role of a man as a bread winner have allowed him to have exploratory, dangerous, and known travels to further locations and longer distances. Therefore, mobility can be found to be associated with masculinity whereas immobility can be associated with femininity (Siwach, 2020).

### **2.2.1. Trip Purpose**

Men and women tend to travel for different purposes. Women's trip tends to be family-oriented, while men's trip tends to be work oriented (Gauvin et al, 2019). A study by (Granbery, 2018) in Poland and in the United States found that the purpose of women's trips tends to be related to shopping for the household, handling official visits to public offices and services, escorting children to school or kindergartens, as well as more trips for entertainment/leisure, and visits. On the other hand, men's trips tend to revolve around going to work or university, with fewer amount of trips for leisure, escorting, or shopping for household. Nosal Hoy et al, (2021) and Susilo, et al, (2019) indicate that trip purpose is related to age, as it changes over the course of human life. Different stages such as

being a student, finding work, marrying, having children, and retiring have direct impact on the purpose of men and women's trips. For example, married women who have children will have frequent trips to the school; a trip that a married woman with no kids will not have.

### **2.2.2. Travel Distance and Time**

According to Nosal Hoy et al, (2021), women tend to travel longer period of times, and they also tend to travel for shorter distances. The length of trips—distances travelled by women are shorter than those travelled by men. A case study by Sánchez and González on gendered mobility (2016) indicates that women's travelling distances between work and home are 40% shorter than men's; as women tend to keep the distance short between work and home (Al-shabibi, 2019). Women also tend to have longer walks to reach public transportation; even though that walking is considered as the least safe mobility option for women (Gauvin et al, 2019). A research by Di Méo, G., (2012) found that women prefer places that are relatively around their homes, they prefer proximate distances, the "inside", the "protected", and the "calm".

### **2.2.3. Numbering Trips – Multi Chaining**

Research shows that women tend to have more trips than men. A simple "trip" refers to a journey from a single starting location to a single destination, typically using a single form of transportation (Vasudevan, 2019). The concepts of "trip chaining" and "multipurpose trips" expand on this definition by recognizing that trips often involve a sequence of destinations and are multimodal (Kwan et al., 2016). Women tend to have more frequent trips and multiple stops than men on the way to and from work. Women's trips tend to be associated to feminized and gender-based routine tasks and responsibilities related to household members. Women tend to have Multiple Stops at different anchor points such as schools, medical places, shopping, workplace, home, children's school(s) or nursery, that are often fixed in space and/or time (Nosal Hoy et al, 2021). Bianco & Lawson, (1998) indicates that that women tend to have 2 more stops on their way back from work to home than their morning trip from home to work. Figure (2.1) compares between the travel patterns of women who drive and have dependent

children and single men who have no dependent children. Women with dependent children tend to have several, repetitive, and chained stops. These stops are focused at family-related destinations such as shopping and children activities. On the other hand, single men tend to have direct and simpler patterns of spatial movements. These destinations tend to revolve around house – workplace destinations (Granbery, 2018).

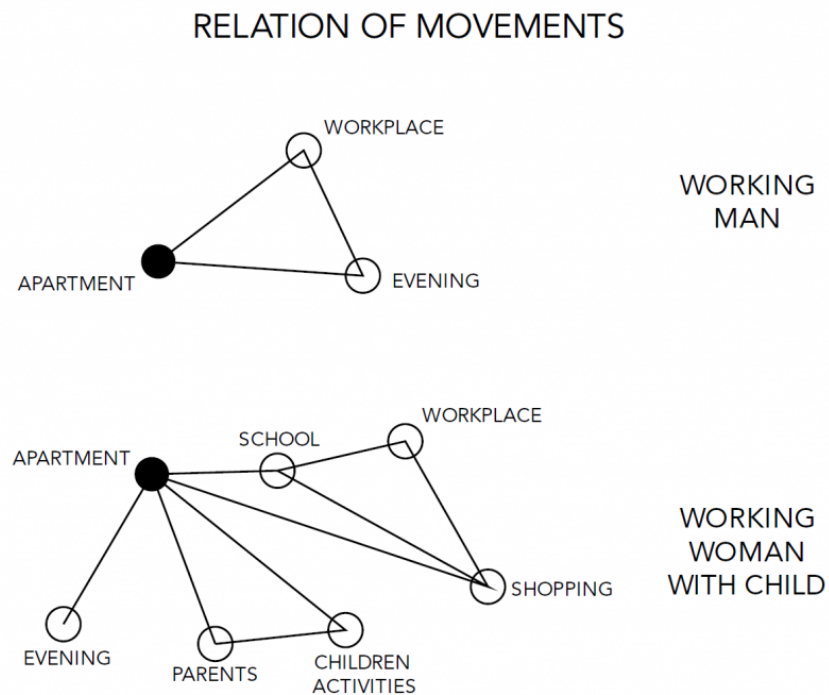


Figure 2.1. Relation of Movement Graph  
(Source: Granberry, 2019)

#### 2.2.4. Familiar Places

A study by Gauvin et al, (2019) on gendered mobility was conducted in Santiago, Chile. It was found that men travel up to 30% new location than women, whereas women tend to travel up to 9 less new places than men. In other words, women’s mobility is more spatially localized, defined, preferred, and repetitive, whereas men distribute their trips to many locations that has equal preferences. The research also found that women had more frequent visits to hospitals, malls, and taxi stops. These gendered trips reflect the larger responsibilities of women to care for their family members.

### **2.2.5. Perceived Safety and Sexual Harassment**

Shaw & Viswanath, (2013) indicates that safety is the basic starting point of literature on gender and mobility. The term “Gender-Based violence” was first introduced by the United Nations Committee. Gender-based violence can be defined as: “...violence that is directed against a woman because she is a woman or that affects women disproportionately. It includes acts that inflict physical, mental or sexual harm or suffering, threats of such acts, coercion and other deprivations of liberty. Gender-based violence may breach specific provisions of the Convention, regardless of whether those provisions expressly mention violence. Sexual harassment and street harassment have two different connotations. Street harassment is more related to public spaces and strangers, while sexual harassment is more related to workplace and colleagues (Abdelfattah, 2019). The experience of harassment and violence can include face-to-face mediated gazes, stalking, remarks, groping, and physical assault by men cities (Shaw & Viswanath, 2013). Violence in urban contexts is typically generated from urban poverty, political motives, targeted violence against women (sexual- based violence) or a combination of these factors (Pozarny, 2016).

Feelings of insecurity and fears of moving around the city are more likely to be a serious concern to women than men (Beebeejaun, 2016). Fear of violence impact on the limitation of women’s spatial movement plays a critical role in influencing women’s perception, impacting her urban prosperity, her life prospects, and her right to everyday life, particularly among the poorest and marginalized (Gauvin et al, 2019, and Abdelfattah, 2019). It decreases her economic, educational and social opportunities, as well as exposing her to physical and mental stress and risks, thus impacting her overall health and wellbeing (Pozarny, 2016). It also acts as a barrier to equal access to active and sustainable transportation options such as walking and cycling (Shaw & Viswanath, 2013). Perceptions of violence can decrease women’s economic, educational and social opportunities, as well as exposing her to physical and mental stress and risks, thus impacting her overall health and wellbeing (Pozarny, 2016). One of the extreme consequences of fear of violence in terms of mobility is forced immobility; where women are forced to stay at home (Shaw & Viswanath, 2013). Abdelfattah (2019) argues that women find ways to safely present themselves in public spaces. For example, dress is considered to have an important role in acting as a mediator between public and private.

A modest dress code is used by women as a means of safeguarding their privacy, it gives a sense of safety and a sense of entitlement to that safety. It is used as a statement to allow her to move freely and safely in public spaces, which eliminates fears of sexual harassment or unwanted attention.

Women tend to impose self-restrictions and prohibitions over certain places in the city, as if they create *invisible walls* in the urban spaces for themselves. They tend to self-exclude themselves from certain places in the city to insure their safety, therefore limiting their access to other social, economic, and leisure activities (Gera et al, 2020). Women have certain principles that determines the spatial accessibility or inaccessibility, this system of distinction between available or prohibited spaces are imposed on themselves by themselves. The feelings those women expressed towards acceptable, accessible, and desirable urban environments and, conversely, unacceptable, inaccessible, and undesirable urban environments can be “classified in terms of several opposing pairs (Pozarny, 2016). Di Méo, G., (2012), summarizes the characteristics of the preferred places by women as the following:

*“ These propositions include, in no particular order: calm and hectic; silent and noisy; clean and dirty; teeming (crowd) and empty (deserted); free moving and jammed or obstructed (traffic); fast and slow; affordable or cheap and expensive; peaceful and aggressive; harmless and dangerous; reassuring and worrying; beautiful and ugly; open or airy and closed, suffocating, oppressive; visible, light, clear, and hidden, concealed, dark; green, greenery, trees and mineral; accessible and inaccessible”* (Di Méo, G., 2012).

According Di Méo, G., (2012), women tend to prefer places that are places that are close and central, and places that reflect beauty in architecture and urban aesthetics, safety and has a sense of security, open, clear, reassuring, easily accessible, and free of darkness, narrowness, closeness, suspiciousness, and unclearness.

Women tend to have higher usage of public transportation and taxi services than men mobility (Gauvin et al, 2019). Women also tend to have longer walks to reach public transportation; even though that walking is considered as the least safe mobility option for women (Shaw & Viswanath, 2013). A large scale study in the US on women’s fear in transit environments and as passengers (Loukaitou-Siders,2009) showed that desolate bus stops and train cars, dimly lit parking lots and overcrowded transit vehicles often compel women to change their transportation modes and travel patterns in order to avoid these settings. Where there is a perception of fear women either do not use these routes at all

or only when accompanied or only during the day (Loukaitou-Siders, 2009) and (Vasudevan, 2019). Generally, public transportation is accompanied with feelings of isolation as a result of the lack of security and human surveillance in public transportation (Beebejaun, 2016).

A survey in London (2014), finds that 15% of women faced sexual harassment in public transportation (Beebejaun, 2016). In India, the figure raises up to 80%, while 62% reported that they did not feel safe in public spaces. Another survey in New York reports that two-third of women were sexually harassed on Public transportation. Another survey in Scotland showed that 1 in 5 women were stalked by strangers, and 43% of women were sexually harassed on the subways. A study in Toronto, Canada showed that 45% of women avoid public spaces and transport at night, whereas only 13% of men do that. The scenario in Egypt is not any better, around 82% of women don't feel safe in the street. It is clear that sexual harassment has no relation with level of development of countries (Shaw & Viswanath, 2013, & Abdelfattah, 2019). Given this reality of violence and insecurity, a common reaction by authorities is to include policies that would address women's safety.

### **2.3. Importance of Spatial Mobility for Women**

The degree of quality of women's lives is directly determined by the extent of her mobility (Peake, 2009). Women's limited mobility jeopardize her chances to benefit from urban prosperity, therefore women and men don't equally benefit from urban prosperity (Pozarny, 2016). Aldosari, 2017 indicates that gendering can have a throughout impact on shaping the system of a certain society. All gendered systems share similar characteristics as they consider women as a "*repository of male honor*"; these systems tend to lower women's access to important positions such in leaderships and politics. It also tends to provide her with lower quality work opportunities, nutrition, and education, as well as to impose control over her sexuality and reproductive ability, in order to adhere to certain cultural image (Aldosari, 2017). Generally, women and men do not have the same benefits in urban environments, as women face larger urban restrictions and barriers. This inequality leads to a gap between the two gender in terms of urban prosperity. The gender-based limitations on spatial movement and the restrictions from entering certain public spaces and from reaching public facilities, services, and

infrastructure critically leads to unequal chances of benefiting from urban prosperity for women. For example, unequal accessibility to decent and stable job opportunities, *“increased workloads with the double-burden of earning income and care work, accessing financial assets and housing security, fair tenure rights, access to services, asset accumulation, engaging in public governance structures, and personal security, the latter due in part to un-favorable infrastructure and transport designs”* (Pozarny, 2016).

Al-Rashid et al, (2020) demonstrates the strong relation between spatial mobility and individual freedom and independency. There is a direct and positive relationship between women’s ability to move and the quality of her social position, the more she is able to spatially move and gain accessibility, the more job opportunities and higher salary she will have, therefore the more individualistic and powerful she will get. Women who have higher accessibility to different locations have better life quality and control; they are more likely to have better health, better contribution to their household. It is also found that their children have fewer children, who in turn, have better education and health. Women’s ability to access urban spaces and to be present in the public domain is empowering in itself; it gives her the freedom to expand her spatial presence and to be able to participate in several civic activities and events. The new experience of spatial freedom has provided women with higher sense of self-esteem and a stronger personality and made them more aware of their identities and their potentials. However, this newly-gained confidence impacted traditional gender role ideologies and disturbed the power structure between the two genders. Chant (2013), elaborates on the relation between women’s ability to work and her self-esteem:

*“Gender disparities in human capital pertain to education, vocational training and skills, and are not only critical in terms of women’s participation in labor markets and economic growth overall but are also an integral aspect of “personhood”, affecting women’s general capacities, their self- esteem and their ability to exert agency.”* (Chant, 2013, p15)

## **2.4. Factors Impacting Women's Spatial Mobility**

### **2.4.1. Individual-Related Factors**

#### **2.4.1.1. Age**

Nosal Hoy et al, (2021) indicates that age is an important factor that impacts women's spatial mobility. He indicates that the older the woman, the more she is able to spatially move for different tasks such as going to work or to handle household-related tasks such as shopping and escorting to school; while the younger she is the less she will travel. The trip purpose aligns with the different stages of women's life. For example, almost 85% of trip purposes for girls who are 12 or younger tend to be related to educational purposes. Escorting trips purpose tend to be the highest among women who age between 30-39. Trips that are related to work are the highest among the women aged between 25 – 60. Women who are aged 60 and above have more frequent trips to public service offices and shopping (Nosal Hoy et al, 2021). The National report by Al – Qarawi & Kamargianni, (2018), indicates that women who are aged between 18 – 25 have the highest intention to drive while women who are aged between between 46 to 55 years old had the lowest intention to drive a car when the ban on driving will be lifted in Saudi.

#### **2.4.1.2. Marital Status and Children**

A study by Nosal Hoy et al, (2021) examined the experience of spatial mobility on the daily lives of urban women based on their marital status in the United States. It is found that married women tend to travel longer distances than unmarried women. Married women are more associated with household responsibilities and reproductive work than unmarried women. Married women tend to prefer job opportunities that are relative to their house, unlike unmarried women who tend to travel longer distances and spend more money in order to get better job opportunities. As a result, it is easier for unmarried women to improve their social status, therefore to improve their overall life quality and wellbeing. According to Vasudevan (2020), women with one dependent child have more obstacles in terms of spatial mobility than women who don't have a dependent child.



Dependent child means a child who goes to school and yet depends on his mother financially and for daily maintenance needs and activities such as cooking, hygiene, studying, medical visits, taking to the park or soccer games, etc.

A national survey on women's mobility was done by Al – Qarawi & Kamargianni, (2018) in Saudi on 31,435 man and women, 11,631 of them are women. The survey revealed that the majority of women in Saudi (76.9) who uses private car are married women. A private car can include a hired driver or a male relative. Only 50.5% of the women who are divorced use the private car. Mostly because married women are escorted by their husbands, while divorced women might rely on a brother or a father, who might not be that available for them. It explains why the women who are divorced and highly educated were the keenest on buying a new car and getting a driving license once the drive ban in Saudi is lifted. In terms of cost in relation to marital status, women who were divorced (around 56%) and widowed (72. 5%) paid much more for transportation cost than women who were married (14.6%) and single (15.3%), (Al – Qarawi & Kamargianni, 2018).

### **2.4.1.3. Education**

According to Al – Qarawi & Kamargianni, 2018, Education is an important socio-demographic indicator that influence women's ability to drive or travel. In their report, the level of education is strongly associated with the level of women's monthly cost of transportation, as well as their mode of travel. Their survey revealed that women who have higher educational level (77.2%) tend to travel with a private car, which indicates more spatial mobility and accessibility. While women who had no education (55.3%) were less likely to travel with a private car, which means lower spatial accessibility. In a study by Vasudevan (2019), in India on women who drive, all of them were educated with at least one university degree, and all of them had professional full time jobs such as managers, directors, entrepreneurs, professors, and educators. Their academic qualification allowed them to get middle class employment that allowed to afford a car, fuel it, and use it for trips to and from work.

#### **2.4.1.4. Cost**

Transportation affordability refers to the financial costs of travel relative to incomes, particularly lower-income residents' ability to afford access to basic (essential) services and activities. Affordability affects accessibility, and it is especially a problem for lower-income workers. Location affects transport affordability. Lower-income residents in automobile dependent locations tend to spend an excessive portion of their income on transport. Overall accessibility can be evaluated with regard to time and money budgets.

People typically devote 60-90 minutes a day and 15-20% of their household budgets to transport, and are willing to spend 5-10 minutes traveling for errands such as shopping and taking children to school. If such services are sufficiently accessible for pedestrians, some people will choose to walk. If not, most people who can will drive. Similarly, thirty minutes and two to four dollars in expenses represents the maximum one-way commute budget. Transport systems that force people to exceed these time and money budgets tend to create a burden, particularly on lower-income households (Litman, 2021).

There is a corresponding relation between having a private driver, the level of education, and to the cost of transportation. Women who have higher education tend to have better salary that can allow her to cover for her own travel cost. In the survey report by Al – Qarawi & Kamargianni, (2018) done on Saudi Women, it showed that women who have higher education degrees are the keenest on having a driving license and owning a car once the ban on driving is lifted in Saudi. Another interesting result was that women who have higher education were found to own a driving license regardless of the ban in driving, mostly because they were able to gain it from another country. Figure (2.2) Indicates the cost of using private car based on the level of education. Women who had higher levels of education are the women who cover their own transportation monthly costs.

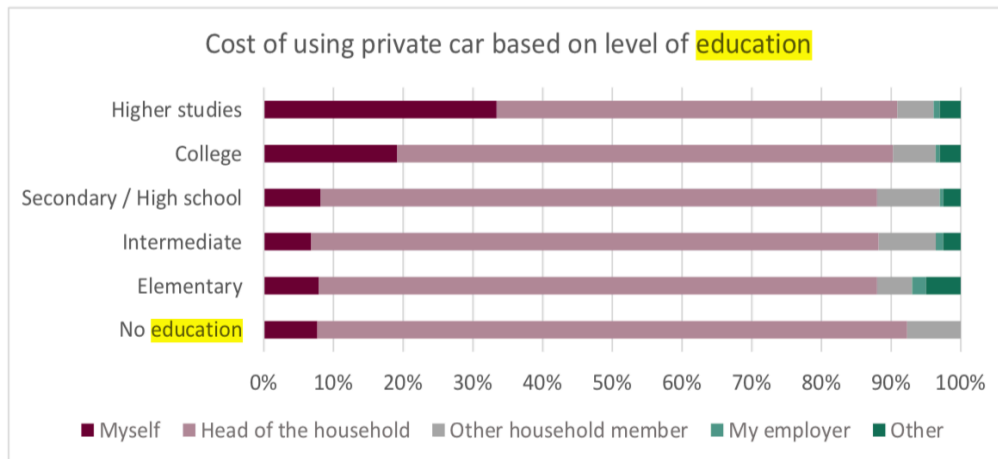


Figure 2.2. Cost of Using a Private Car Based on the Level of Education for Saudi Women

(Source: Al – Qarawi & Kamargianni, 2018)

#### 2.4.1.5. Income and Employment

Gauvin et al, (2019) indicates that the gender inequality in mobility is widened in presence of income inequality. Gender differences in mobility vary across different socioeconomic strata of the population, it exists in both poor and wealthy communities; but is more present in the poorer one. Women from lower income household tend to travel less than women with better income households. Also, gender gaps in mobility can also exist in the same socio-economic class. On one hand, women from lower income households tend to have less spatial mobility than their male counterparts. On the other, women from higher income household tend to travel less than their male counterparts. Meaning that full mobility equality is can't be achieved (Gauvin et al, 2019). Alshabibi (2019), indicates that women from low-income household depends on private cars in 53% of their trips, while that percentage rises to 75% for women from higher income households. It means that women who have higher income are able to afford private cars, therefore, they would automatically have more freedom in terms of spatial mobility than women who have lower income and can't afford a private car. Lower income remains a relevant factor that constraints women's mobility even when public transport is available (Vasudevan, 2019). In the survey report by Al – Qarawi & Kamargianni, (2018) done on Saudi Women, it showed that high-income strongly influences the mode of travel. The

survey showed that 80.6% of the women who use private driver come from a high-income household. Figure (2.3) shows the current transport mode use based on personal monthly income for Saudi Women. Women who have higher monthly income tend to drive to work with her own car or with a private driver and less with other public transportation modes. Women who have lower income tend to travel more with other transportation modes.

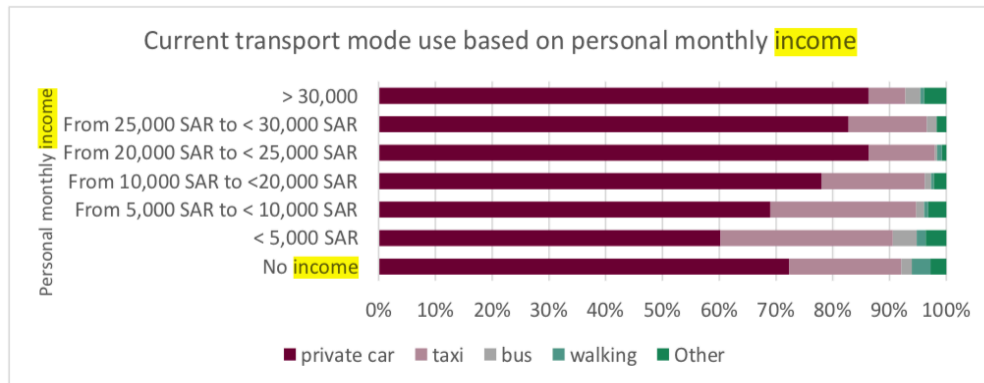


Figure 2.3. Current Transport Mode Use Based on Personal Monthly Income  
(Source: Al – Qarawi & Kamargianni, 2018)

### 2.4.2. Social-Related Factors

Social and cultural factors have critical influence on the extent of women’s spatial mobility. As discussed before, the traditional role of women as caregivers and men as breadwinners have constituted the extent of their spatial mobility and the way they both use the city (Cresswell, & Priya Uteng, 2008). Literature does not show a comparison between women’s mobility across the world, therefore we will build on the “gender role” concept and assume that women who come from more traditional or conservative countries such as Saudi, India, and Iran, tend to travel less than their female counterparts who come from a less conservative country such as Northern Europe. Peake, (2009), indicates that gender-based urban inequalities are higher in rural areas, but they still exist even in the most democratized and equality-oriented global cities. Everyday activities performed by women and the corresponding spaces used by them, the mobility of women is largely restricted to the private space and whatever little mobility she has in public space is due to the nature of activity she is involved with. Thus, it is the “Gender roles”

assigned to women that determines her course of mobility. Her life shuttles between the private sphere of the household and the public spaces which require her assistance (Siwach, 2020). Unequal social responsibilities the urban setting of functions is not designed in a way to make it easier for women to save time, which make her prone to “time poverty” Even though women’s accessibility to paid work is increasing, yet that does not mean that men’s participation in domestic responsibilities has also increased. The unequal distribution of domestic unpaid responsibilities is persistent problem. Time poverty comes when women can barely find time to fulfill their dual paid and unpaid responsibilities (Pozarny, 2016). Peake, (2009), indicates that gender-based urban inequalities are higher in rural areas, but they still exist even in the most democratized and equality-oriented global cities. The Harmonised European Time Use Survey statistics data shows that there are particular patterns of how women and men use their time and their participation in household and family care: women are, on average, more involved in household and care activities than men (HETUS, 2019).

### **2.4.3. Political-Related Factors**

#### **2.4.3.1. Official Laws and Regulations**

Official laws and regulations can play a determine role in dictating women’s mobility or immobility. Until 2018, Saudi Arabia was the only country in the world than bans women from having driving license by official law not culture. Saudi Arabia banned women’s driving in 1957 under social and religious influences. Women could only spatially move when accompanied with a male relative like a father or a husband. Furthermore, Saudi Arabia does not provide sufficient public transportation services, which hinders women’s spatial mobility even further. As a result, women dependent highly on their male relatives for rise, or hiring a private driver if they could afford it (Al-Rashid et al, 2020). The dependency on private drivers is high in Saudi Arabia, where almost 87% of families in Saudi Arabia have one or more private driver (De Bel-Air et al, 2017)

### **2.4.3.2. Land-Use**

Land use is an important contributor when it comes to proving accessibility. Clustering and mixing of common destinations increases accessibility. Having common destinations within walking distance (less than a mile) significantly increases accessibility. Having more central location increases accessibility. Also having a more connected road network increases accessibility. Mix-use refers to various land uses (residential, commercial, institutional, recreational, etc.) located close together. Land use density, clustering and mix tend to increase accessibility. For example, a neighborhood or activity center with housing, stores, offices and transport services located close together provides a high level of accessibility. Generous parking supply tends to improve automobile access but can reduce accessibility by other modes (Litman, 2021).

### **2.4.4. Gender Biases in Transportation and Urban Planning in Professional Practices and Academic Research**

Women suffer disadvantages when experiencing cities that are developed by men. The city and its routes are designed in a way that will insure women dedication to the service of the family, in a way that channels women to perform their “duties as wife, mother, or paid worker and consumer”. Moreover, she argues that the urban planning and spatial organization is designed in a way that would reinforce reproduction of women’s labor and “their supply of solicitude”. This exploitation is done with the “unconscious” approval of women of this exploitation (Di Méo, G. (2012). Women have been alienated from the practice of urban design and planning due to cultural and societal aspects. Vasudevan, (2019) argues that this alienation from engagement in urban planning was not deliberate, but rather a normal outcome to men designing the city according to their own experiences and knowledge.

Urban and transportation planners often neglect women’s needs when it comes to public transportation. The overall practice of transport planning often fails in designing gender-responsive systems (Vasudevan, 2019). The field of public transportation is male-dominant, where women make up less than 20% of the global transport workforce (ILOSTAT, 2019). It is important to have a more diverse team with different perspectives to design gender-responsive systems. It is due to the systemic lack of awareness and

exposure to career pathways, women continue to be underrepresented in transportation occupations (TUMI, 2021). In an interview with Sonya Byers, the CEO of Women in Transport, a non-profit network which supports the professional development of women working in transport; she advocates for the need to have more women involved professionally in the practice of urban planning and design:

*“Sustainable transportation means the needs of everyone who uses transport are taking into consideration when we are designing the transport mode that they use. And the role of women in the transport sector is to be represented and to do every job on every level from operational up to chief executive. Unless we have a representation on every level of the organization across the transport sector we can’t have a truly sustainable network of transport system across the world”*  
(Transformative Urban Mobility Initiative, 2021)

Women’s ability to enjoy the city and to expand their urban spatial accessibility depends crucially on urban planner’s profound understanding for the reality of gender urban spatial experiences (Beebeejaun, 2016). The lack of proper comprehensive study for women’s daily experiences in the city, and the social dynamics within urban spaces creates a deficiency in urban studies. Understanding this complex nature of urban social dynamics and the gender power relations in the city is still far from being taken seriously in the field of planning and urban policy. Pozarny indicates that *“the breadth of evidence from the literature also indicates that women’s experiences in urban environments and their effects on beliefs and practices concerning gender roles is complex”* (2016, p3). Nevertheless, Urban planners ought to learn how to change planning practices to be more gender-considerate. Understanding gender-based urban dynamics and the intersection of power-time-income poverty requires a multi-dimensional and multi-sectoral perspective.

The majority of academic research in the field of urban studies is gender-biased, and can only be understood from a male perspective. Including the needs of urban minorities such as women, children, and people of color. Academic research started in the 70s . They were the first to advocate for equality between urban needs for all groups. Subsequently, the professional practice for urban planning and design, starting from designing codes to the execution, is gender-blind and takes little regard to the needs of different urban groups (Vasudevan, 2019). Peake,( 2009) indicate studies of women and family (historically and the present) have added a new perspective to urban planning and morphology research. The gendered dimension of urban planning, urban life, mobility, the equality of rights movement, and the critique of gender-related issues in urban

planning started during the 1970s and reached its peak during the 1980s and the 1990s. Research included women's urban problems such as public transportation, housing, childcare, etc.

During and after the 70s, studies started to reveal how the practices of urban planning are gender-biased/blind, and its advocating for gendered space and the needs of men and the family. Urban planners and academicians started to explore the notion of a "nonsexist city", and the notion of equally-designed cities for men and women. It was able to reshape and reinterpret the way we understand gender and gender relations through debates. Peake, (2009) claims that Academic research has a critical absence for the contribution of female's mobility as an important element in urban changes: "*Women become hidden from geography as they were once "hidden from history"*". She argues that women as an important element were not taken in consideration when analyzing urban mobility and morphology.

The lack of feminine perspective and the dominance of patriarchal research over the discipline of social researches and human geography has created an incomplete image for the reasons of social change and urban morphologies. Gillian Rose indicates that geography, and all related studies that are built upon it, are "masculinist" to the point that it can only be proved and understood when viewed from a masculine perspective: "*to think geography- to think within the parameters of the discipline in order to create geographical knowledge acceptable to the discipline — is to occupy a masculine subject position*". Her book, *Feminism and Geography*, is considered to be one of the best original work on studying the relation between gender and geography and their essential role in historical development process, where she aims to resist and go beyond the "masculinism of geography". Beebeejaun, (2016), argues that the patriarchal dominance over academic research have provided a one-sided gender perspective perspective. Even though urban planning scholarship that is concerned with gender equalities is continuously increasing, yet the gendered perspective is still not critically and strongly present in urban planning planning, policy, and practice. According to Bondi (1995), patriarchy, which is defined by the dominance of men over women, as as an important element in historical research to understand the creation of unequal gender relations. She elaborates that women within and between two societies can experience patriarchy in different ways. She argues that the production and the reproduction of unequal gender relations is created through their relation with the urban land itself. The nature of these relation can only be understood under deliberate and detailed studies.



Moreover, Bondi (1995), indicates that Women exclusion from historical geography is a deliberate political act that is used to maintain their oppression and male dominance. On the other hand, research interest in gendered mobility have been on the rise in the last few decades. Studies included gender disparities, differences in mobility behaviors between genders, and even the relation between car purchasing and gender and the factors influencing the purchasing decision (Alshabibi, 2019).

Understanding the interrelation between the spatial and the social that we can realize the essence of the problems facing women in experiencing and commuting the city. It is essential to study the social aspect of women's mobility to insure a better mobility for her. In the modern city, spatial mobility and urban spaces have become gendered; as the way both genders experience the city and urban life is "inherently gendered". Mobility and immobility are crucial in the determination and constitution of gender, as mobility can be found to be associated with masculinity whereas immobility can be associated with femininity. Gender roles and urban sexual violence are crucial for dictating women's spatial mobility and overall city experience. The pattern of women's spatial mobility is different from a man's, women tend to have more family-oriented, shorter distances, longer period of time, more trips, Multi-chained trips, familiar destinations, and have higher usage of public transportation. Individual and social related factors impact women's spatial mobility, Women who are older in age, married with at least one dependent child, have lower education, unemployed, come from lower income household and carry certain socio-cultural burdens such as "family's honor", tend to have less spatial mobility and overall city experience. Other political factors such as laws and regulations, and the lack of female participation in the academic and professional field of urban planning and designing play a great role in hindering women's spatial mobility.

## CHAPTER 3

### SITE AND METHODOLOGY

#### 3.1. Site Study

For this study, a combination of a face-to-face survey and an online interview is used to provide a comprehensive understanding for women's spatial mobility and accessibility in the Jeddah city. Jeddah is the largest coastal city and the second largest city in Saudi after Al-Riyadh, the Capital, with a population of 4 Million people. It is located in Mecca province on the west coast of Saudi, at the center of the eastern shore of the Red Sea Figure (2.4). Between 1927 – 1970, Jeddah was a small walled city of a population of 50 thousand residents. It's economy mainly depended on commerce and pilgrimage month (*Jeddah is around 90 km from Mecca, the holy city of Islam*). During this period, the urban fabric of Jeddah maintained its traditional character. Upon the discovery of oil, the city grew in both population and economy (Abdu et al. 2002). It is worth to mention that the number of daily trips between 1970 and 2007 has increased from around 300,000 trips to 6 million trips (Aljoufie, 2015).

The selected site for conducting the survey is the Waterfront, which is of the most important and visited recreational public areas in Jeddah. The waterfront of Jeddah (*This name is the literal translation for the Arabic name: (الواجهة البحرية)*). The location is on the western side of Jeddah, and is extended for 4.5 kilometers along the coastal side of Jeddah. The site has a capacity that goes up to 120 thousand people. The place was selected because it is one of the few vibrant public spaces that women can openly visit and spend lots of time there doing many activities such as biking, walking, running, picnicking, jogging, and so on. The location is also the main destination for major local and international cultural and social events and live shows.



Figure 2.4. Jeddah City in Relation to the World  
 (Source: Aljoufie, 2015)

### **3.1.1. Saudi Arabia**

History of the formation of the Kingdom of Saudi Arabia can be traced back to the mid 1700s, where it emerged as a result of religious and political arrangements. It took until the 20<sup>th</sup> century to form an official state after going through political unification. The 20<sup>th</sup> century witnessed major transformations in terms of societal, traditional, and personal identities. Those transformations are mainly due to political unification, oil discovery, and globalization. Other factors pushed the change further during the 21<sup>st</sup> century; and challenged the culture and traditions of Saudi Arabia. Factors such as social media, online education, Saudi youth studying abroad, and various civil movements such as women movement (Al-bakr et al, 2017). Until 2015, Saudi Arabia had an oil-based economy; as it owns 18% of oil reserves in the world making it the the largest oil exporter (Naseem, 2018 ). In 2015, Saudi Arabia went through major economic and social transformations. It initiated the Vision of 2030 which aims to transform Saudi Arabia from an oil-based economy to a post-oil economy and include more Saudi population into the work force (Hvidt, 2018). One of the aims is to empower women and enable them to join workforce and decrease their unemployment rate. Lifting the ban on female driving was the first step to achieve this change (Naseem, 2018 ). Several attempts were taken to provide women with basic rights such as education and employment. Yet, social stereotypes about women's role still stands as a barrier to closing the gaps between genders in education and employment (Al-bakr et al, 2017).

### **3.1.2. Women and Gender Roles in Saudi Arabia**

The World Economic Forum 2020 Global Gender Gap Report ranked Saudi Arabia 146<sup>th</sup> out of 153 countries for gender parity (World Economic Forum, 2020). Mobility was one of the important considerations for this ranking. Saudi is considered one of the most gender-segregated and conservative socio-political countries in the world (De Bel-Air et al, 2017), and (Gorne, 2016). Gender roles and all other aspects of life in Saudi Arabia are influenced by the strict Wahabi implementation of the Sharia Law (Mustafa & Troudi, 2019). Gender roles were emphasized in the first female schools opened in the 1960s, as the main aim was to educate girls to become mothers and wives. Until recently, women could not pursue their higher education in engineering, political

science, petroleum, and architecture, whereas available fields were limited to social science. Furthermore, working opportunities were limited, as she was only permitted to work in non-mixed environments (*Non-mixed/mixed is a term used to describe an environment where women and men work/exist together at the same place*). Nonetheless, women's participation in leadership and decision-making positions remains low and less than 1% (Al-bakr et al, 2017). Mandeli (2019), indicates that Islamic principles and religion-cultural values remain manifests in many aspects of the urban life in Jeddah. Ranging from the culture and tradition to the urban development and architectural aspects of the city. In the case of Jeddah, the Islamic principles is manifested in gender separated public spaces as well as the restrictions on female's spatial mobility (Mustafa & Troudi, 2019).

### **3.1.3. Realities of Women's Commuting in Saudi Arabia**

Mobility in Saudi Arabia for women is a challenge; it is gendered and experienced differently for both men and women. Women's driving was officially banned in 1957 as a result of socio-cultural norms, as well as the radical implementations of Sharia law ( Naseem, 2018 ), (Qiu, 2017). Women could only travel short and long travel distances accompanied with a male family relative, like a father, a brother, a son, and an uncle (Al-Rashid et al, 2020). In case there was no male relative or a private driver, then women would mainly use a private driver, an online hailing service (UBER, CAREEM, etc.), the employer's shuttle bus (in case she was employed), or a taxi (Qiu, 2017). Currently, public transportation services in Saudi Arabia is limited and weak, therefore, demand on private vehicles is very high (Al-Rashid et al, 2020). A survey by Al – Qarawi & Kamargianni, (2018) in Saudi revealed the heavy reliance on private cars. The result of the survey showed that 70% of women use private vehicles, 22.5% use taxis, 3.0% walking, and 2.2% public buses. The results of the survey on the percentage of used transportation by Saudi Women is presented in figure (2.5). An interview by the Public Opinion Survey Unit of the King Abdulaziz Center for National Dialogue showed that around 87% of interviewed families in Saudi hired a private driver (De Bel-Air et al, 2017).

New to move and navigate the city with a certain degree of freedom. It is considered more affordable than taxis, and is estimated that 70%-90% of UBER riders are women. Mobility is costlier for women than men, and is considered the main

challenge and barrier to women’s employment and accessibility to work opportunities. in a research conducted in Riyadh on a group of female employees, the cost of mobility (*By hiring a private driver, or using an online hailing app*) took up to 40% of their monthly salary (Qiu, 2017). It is also worth to mention that Jeddah’s weather is extremely hot most time of the year where it is extremely hard to be outside during the day. The urban form of Jeddah is designed according to the American one: long distances between neighborhoods, work places, services, leisure, etc. Therefore, even if there were no laws or social/cultural barriers, it would still be very difficult to rely on walking or cycling as a main or a secondary commuting mode ( Metro Jeddah company Website, 2017). All of the mentioned obstacles on commuting push the majority of women to remain immobile most of the daytime between 10 am – 5 pm. If they needed any essential trips such as doctor visits, basic groceries shopping, picking up children, etc., then they must wait for their male relative such as husband, brother, or father to drive them to their destinations.

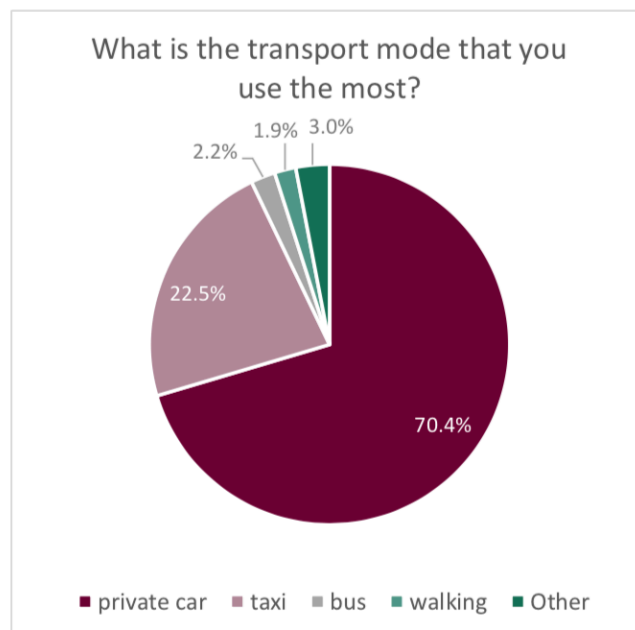


Figure 2.5. Percentage of Used Transportation by Women in Saudi

(Source: Al – Qarawi & Kamargianni, 2018)

These restrictions on mobility had a critical impact on women’s employment prospects (Qiu, 2017). According to Naseem (2018), Saudi Arabia have a large gender gap in the work force participation, and has the lowest female labor force participation

on global scale. Workforce in Saudi depends mainly on male labor rather than female labor. It is estimated that of the 9.1M female are of working age, yet only 1.8M of them are working compared of 77.8% of males. This huge gap is mainly caused by the hindered mobility. In the past 10 years, many women tried to protest against the driving ban by driving inside the city, unfortunately, some of those protesting women were caught and sentenced to jail (Al Shabibi, 2019).

On the 24<sup>th</sup> of June, 2018, the ban over female driving was officially lifted in Saudi Arabia, and women could autonomously drive themselves, for first time, to any place at any time they want. It is estimated that 3 million women will officially start driving by 2020 ( Metro Jeddah company Website, 2017). It was made possible for women to apply for Saudi driver's license through online portals and women-only driving schools in all cities in Saudi. (Al-Rashid et al, 2020). On the social and personal level, women's accessibility to spatial mobility is predicted to increase employment competition, decrease childbirth, and increase accessibility to healthcare and childcare facilities. On the wider level level, women autonomy and car ownership is predicted improve efficiency in the number of required trips. The illustration by Krane & Majid, (2018), shows the difference in inefficiency between trips taken by women themselves, and trips taken by chauffeuring. Chauffeuring takes triple the consumed time and distance than normal women-driven trips. It is also predicted that road traffic deaths and crashes will reduce (Krane & Majid, 2018).

However, autonomous driving is still in its first phases, and women, so far, still depend mainly on male family, private drivers, taxi, or Uber (Al-Rashid et al, 2020). It is important to state that the research in women's mobility in Saudi in relation to commuting patterns, demand, and behavior is still very limited. The is due to the previous limited spatial freedom of mobility, sociocultural reasons, as well as the extremely limited availability of public transportation options in Saudi cities: "And the findings of all published researches about gender based transit modal choice and preferences are not applicable to Saudi Arabia, especially when it comes to Saudi women's preferences and transit modal choice." (Krane & Majid, 2018).

### **3.1.4. Availability of Public Transportation**

As far as today, public transportation service in Saudi is very weak, as it only form 2% of the total trips done by citizens As part of 2030 Vision, transport authorities have issues a a full transport network plan which will be completed by 2033 (JPTP, 2017). Currently the only available public transportation service is a state-run bus service “*SAPTCO*” (Saudi Arabian Public Transport Company). For instance, SAPTCO has provided the intra-city public transport (Buses) in Jeddah which has only has 6 routes with a long-time frequency of 15 – 30 mins. However, the current state of transportation system in Jeddah is haphazard; the routes of these buses are planned randomly and not according to demand, the infrastructure is deficient, operation times are limited and unscheduled, and it all run in some main cities in Saudi Arabia. Notably, those buses are mainly used by non-Saudi labor and are avoided by women; as it is still not acceptable by the society for women to those buses. On the other, even if they were to be used by women, they still lack comfort, privacy, convenience, and needs of a child caring mother. Furthermore, infrastructure facilities are not prepared for women, such as bust stops, and adjoining sidewalks (Qiu, 2017), (Al-Rashid et al, 2020), (Alshabibi, 2019), (ALjoufie, 2015).

### **3.2. Research Design and Methodology**

This research depends mainly on two methods: a face-to-face survey with 100 women, and an online interview with 6 women. The first part of this paragraph will discuss information related to the conducted survey. Conducting the fieldwork and the survey was faced with some limitations and challenges that refrained us from conducting the survey freely. A challenge was the conservative nature of the society in Jeddah in terms of culture and politics, as the matter of “women’s driving” is still a controversial and sensitive topic in the Saudi society. Allowing women to drive was a political move that came during critical and unstable political transformation in the Saudi government and in the royal family. Therefore, we were very careful in stating the questions to abide to the political or cultural lines of the Saudi society and politics. Another limitation was the COVID-19 that challenged us to have full and comfortable survey time with the respondents. We were very cautious at not gathering too many people at the same time,



which prolonged the process of conducting the survey. Another challenge was the need for some official permits, as we were stopped several times while conducting the fieldwork by the waterfront guards. The problem was solved later by few friends who were able to convince the guards that the survey is done for mere educational reasons. Fourth challenge was the massive preparation for the biggest event in Jeddah: The global racing event “The Formula 1” which is planned to happen in December, 2021. Big part of Waterfront was closed for preparations and heavy constructions, which limited the accessibility of Jeddah’s residents to the waterfront, therefore the availability of people and women at the Waterfront was way less than expected. All of these aspects acted as a challenge and prolonged the process of fieldwork and conducting the survey, but it did not stop us from proceeding with the survey. Nevertheless, the fieldwork was conducted for 3-4 hours over 4 days in the Waterfront. The total number of women surveyed in the fieldwork was 100 women, each woman took between 10 – 15 minutes to complete. It included sharing the surveys with women so they can fill it, as well as initiating few conversations afterwards to hear their feedback and observations on their spatial experiences and mobility. The results from the survey will act as a valuable quantitative data, and the initiated conversations will act as a supporting insight. The conversations were spontaneous and usually started by the surveyed women. We could not record the conversations because they were not expected nor required, but we were able to note them down while initiating the conversation. Generally, both women who have or don’t have a driving license shared great energy and enthusiasm in regard to the survey topic. A reaction that is expected, given that driving for women is a matter of celebration and a won-case for women in Saudi Arabia. The second part of this paragraph will talk about information regarding the conducted online interview. The interviews were conducted with 6 women who have different backgrounds. These women were contacted by me directly, I took their numbers while I was conducting the face-to-face survey. They showed great anticipation and enthusiasm and they accepted to volunteer for the online interview. The interviews were done over 2 months via phone program “Facetime” or “whatsapp”. Each interview took between 10 -15 minutes to be conducted.

Talking to these women have reminded me with my own experience in Saudi Arabia. I was born in Saudi Arabia, and I lived there for 25 years. I moved to Turkey in 2019, one year after lifting the ban on driving. Throughout my childhood and the majority of my adulthood, having access to transportation was always a serious struggle and obstacle. During middle school and high school, the only to move from my house to any

other point was to be escorted by a male relative, in my case it was my father and my younger brother. There was not any kind of provided public transportation like a bus system or a metro. Taxi has always been a source of danger to women and I don't remember using any while my staying in Saudi. Depending on a male relative for transfer created a big burden on me and my male relative. Because both of our times had to align, and both of our destinations also had to align. In many times the entire trip had to be cancelled because the male relative could not (or did not accept) to escort me to my destinations. The destinations that I was allowed to be escorted to were relatively close to the house in terms of time and distance. Therefore, I could not discover many places while growing up. Until the age of 19, my knowledge of different locations of Jeddah city was extremely limited. It is also worth to mention that hiring a private driver was very common yet very expensive, and my family could not afford it back then. My experience with spatial mobility in Jeddah is a subjective one, because many of my friends had private drivers and their experiences were very different than mine. In 2013 and 2014, the hailing service: Uber and Careem, were introduced to Saudi Arabia. The availability of these two service created a revolution for women in Saudi, as they started to use it as an alternative for their male relatives or paid drivers. 2013 was a milestone year in my life as a woman as I started to have freedom in moving around the city for the first time in 19 years. My perception of Jeddah and my space-based memories are created after that year. Yet, even though Uber and Careem were available, their prices were very expensive and created another financial burden on me and my family. Another problem was the continues sexual harassment that I was exposed to. In a week I had to use Uber for at least 10 times to go between university, home, and different locations. I remember that eventually I learned to get used to be exposed to these unpleasant incidents with the drivers and got enough by giving them low rating on the App. In 2018 I started my full time job and I was able to use Uber and Careem without any limitations, as I was able to afford any trip for any cost. My monthly costs for transportation was high, but I was very happy to earn my partial freedom to go wherever I want. In that year I started to attend all cultural events, social and network gatherings, musical nights, attend new café openings, visit friends that are on the other side of the city, go to the waterfront any time I want. I can clearly say that the most fruitful years of my life were when I was able to completely afford endless number of trips with Uber. My personality and my friends network expanded tremendously and I became more aware of myself and things around me as well. In 2018, the ban on car driving was lifted and women started to apply for

driving license. Unfortunately, due to my status there as a foreigner, I was denied the right to apply to a driving license. It is worth to mention that I applied in July 2018 and did not get an approval until the date of writing these words. Yet, gaining a driving license is a dream that I am currently working on, and this thesis is a tribute to all of the women who were denied their right for the freedom of spatial mobility in Saudi Arabia

### **3.2.1. Online Interview**

The interview is conducted with 6 women who come from different background. The interview uses pre-prepared semi-structured questions. A structured interview has several advantages over an unstructured interview, including:

- The interview experience is more consistent and less prone to errors.
- The interview experience is more effective as questions are formulated in advance to collect the most important and relevant information.
- The interview experience is less likely to be biased as interviewers work from a script.
- Interview responses are easier to compare.
- Interviews and evaluations are more efficient as the interviewer asks set questions designed to collect useful information and evaluate the same question responses for each interviewee.

The data collected from the interviews aims at exploring women's spatial mobility in terms of tasks, daily responsibilities, daily patterns of urban activity, their perceptions of driving and commuting experiences, what constrains their mobility, the challenges to their spatial mobility, advantage and disadvantages, and sexual-harassment.

The interviews were conducted using an online using Video Call applications such as Whatsapp (For Android users) or Facetime (For Iphone/Macbook users). The interviews were conducted over 2 months (January + February). Each interview took between 10-15 minutes to be conducted. The women who had the interviews had the following characteristics:

- Women with driving license and own a car
- Employed and non-employed women
- With or without any dependent children
- Single or married

The interviews used semi-structured questions to explore women’s perceptions and experiences of their spatial mobility in the city. The questions were divided into 3 Categories, each category had 1-3 questions. The questions handled the following topics: chain travel (Stops – number of stops- How they present themselves in public spaces? how long do they stay on the street; do they have long stops at nowhere? How do they feel on the traffic lights and parking lots? How comfortable are they to be seen? do they answer strangers when they are approached for directions? How do they ask for directions? How prepared the urban areas is for her? Would you prefer to have s specific parking lot for women? How do you prefer to present yourself in public? What is the difference between choosing to drive a car and not use public transportation? Do they have any constraints about traveling/driving time? Where do they go? is it inside of their neighborhood? How much time it takes? What is the frequency of their trips?

The following schedule summarizes the questions used in the interview, it Is divided into three sections which address different aspect of the experience of spatial mobility:

Table 3.1 Interview Questions

| Focus Area                                      | Questions   |
|---|---|
| <b>Patterns and Characteristics of Movement</b> | 1. In your own words, can you describe in detail a typical daily trip? (What time, which destinations, how long do they stay, how long travel time)<br>4. What is your idea about an avoidable area and a preferable area to be present in?<br>5. Why did you chose driving over traveling with other public transportation or hiring a private driver? |
| <b>Perceptions of Safety</b>                    | 6. In your own words, describe one of the most disturbing events/experience you had while you were driving?   |
| <b>Driving, Health, and Well-Being</b>          | 7. How did driving impact your overall health and well-being?   |

### 3.1.4. Face-to-Face Survey

The questions of the survey were designed in a way that can feed different insights to the research. The survey includes two sections; each section has 6 - 10 closed-ended questions that will cover one of the following differences between adult employed women who drive and women travel by other means in terms of their:

- Characteristics of their spatial mobility (length of trips, time spent, number of stops, etc)
- Individual factors such as age, salary, level of education.
- Gender roles, with taking into consideration the factor of being a mother and having at least one dependent child.
- The perception of security and sexual harassment while traveling or driving.

The survey aims to provide data that can be used for a comparison between four main categories. The total number conducted surveys was with 100 women who are working and over 18 years old. Among these women there are four groups of women detailed at the following chart:

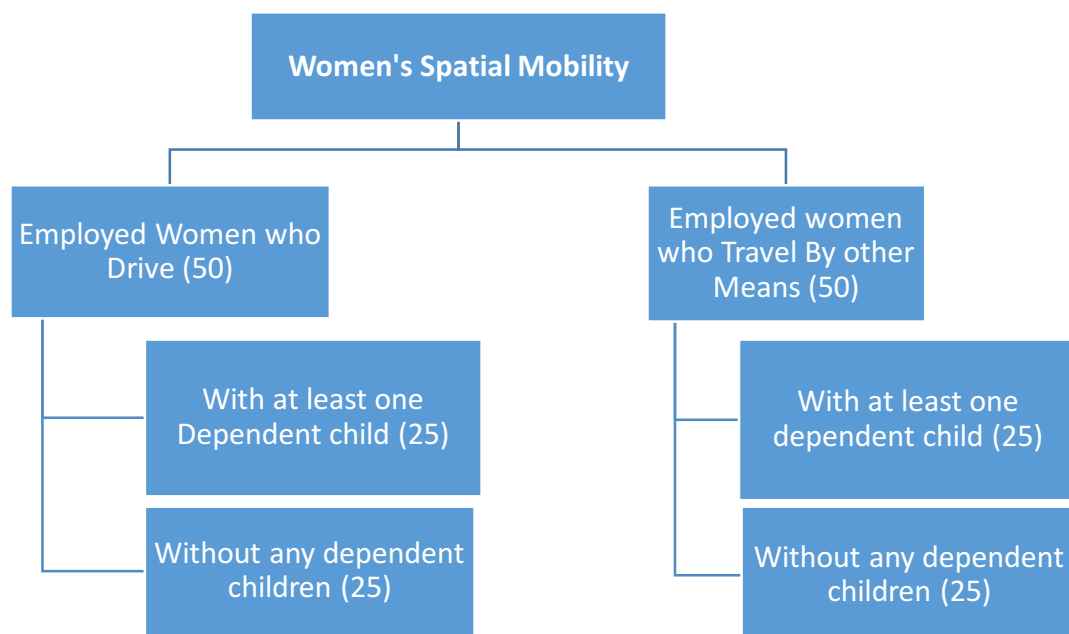


Figure 2.6. Compared Main Categories and Sub-Categories

## CHAPTER 4

### FINDINGS AND RESULTS

#### 4.1. Face-to-Face Survey Results: Characteristics of Women Who Travel and Women Who Drive

The first part of the survey will compare between women who drive and women who travel by other means in terms of individual characteristics: Age, education, salary, marital status, and availability of children. The comparison will be between the following two categories:

- 50 women who commute by driving their own car
- 50 women who commute by traveling with other means

##### 4.1.1. Age

The first character is the age of women in relation to having a driving license/owning a car or traveling with other transportation modes. The result of survey for the women who drive turned out as the following; 14 out of 50 age between (18-24 years old), 28 out of 50 age between (25 – 40 years old), and 8 out of 50 age between (41-60 years old). As for women who travel; 19 out of 50 age between (18-24 years old), 24 out of 50 age between (25-40 years old), 8 out of 50 age between (41-60 years old).

The chart below (Figure 4.1) shows that women who are younger than 25 tend to drive less than women who are in their middle age. Perhaps because women who are in their middle age tend to work and are more financially stable, and therefore be able to afford a car. The findings for this question supports some of the findings of Nosal Hoy et al, (2021), which indicate that women who are older, mostly between 24 – 60 years old

have more spatial accessibility and mobility. On the other hand, the findings of Al – Qarawi & Kamargianni, (2018) expects that women who are aged between 18 – 24 are the keenest to have a car and will be the first to drive, yet the result of our survey question shows that they drive less than older women.

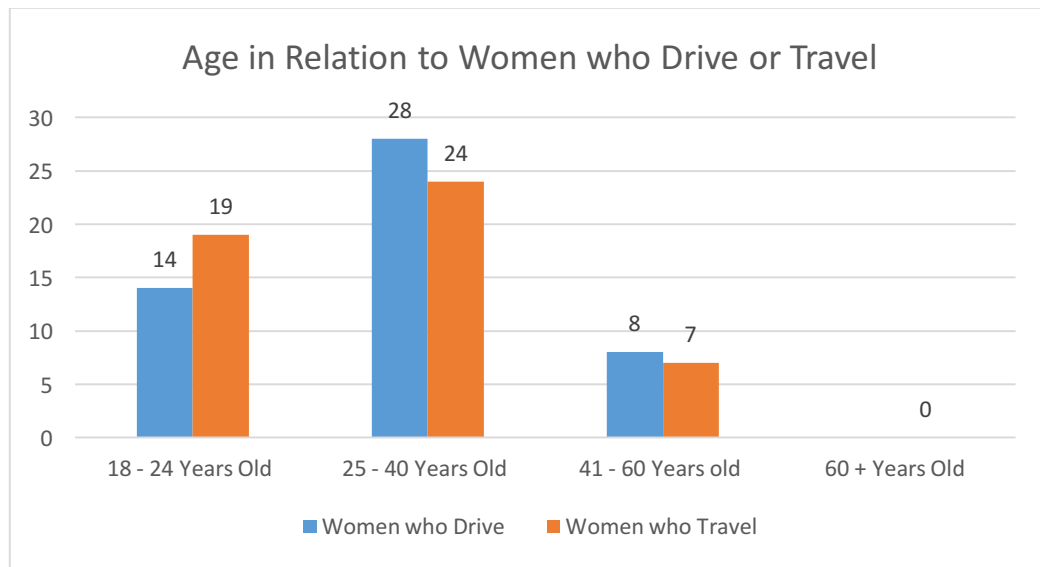


Figure 4.1. Age in Relation to Women Who Drive or Travel

#### 4.1.2. Salary

The second character is the salary of women in relation to having a driving license/owning a car or traveling with other transportation modes. The result of survey for women who drive turned out as the following; 8 women out of 50 earn 16,000 SAR or more, 27 out of 50 women earn “11,000 SAR-15,000 SAR”, 13 out of 50 earn “5100 SAR – 10,000 SAR”, and only 4 out of 50 earned lowest groups salary of “5000 SAR or less”. As for employed women who travel by other means, 2 women out of 50 earn 16,000 SAR or more, 9 out of 50 women earn “11,000 SAR-15,000 SAR”, 26 out of 50 earn “5100 SAR – 10,000 SAR”, and only 13 out of 50 earned lowest groups salary of “5000 SAR or less”.

The results shown in the graph (Figure 4.2) indicate that the salary for women who drive tend to be higher than women who travel. Certain aspect might influence the

choice of mode of travel such as the availability of a private paid driver, which might explain the women who earn above 16,000 SAR are not driving themselves to work.

The results of this question supports the findings in the literature. Women who have better income or come from a higher income household tend to have better spatial mobility and accessibility to different destinations on the city (Gauvin et al, 2019). Women who have higher income tend to travel more, depend less on private drivers, and can afford her own transportation cost.

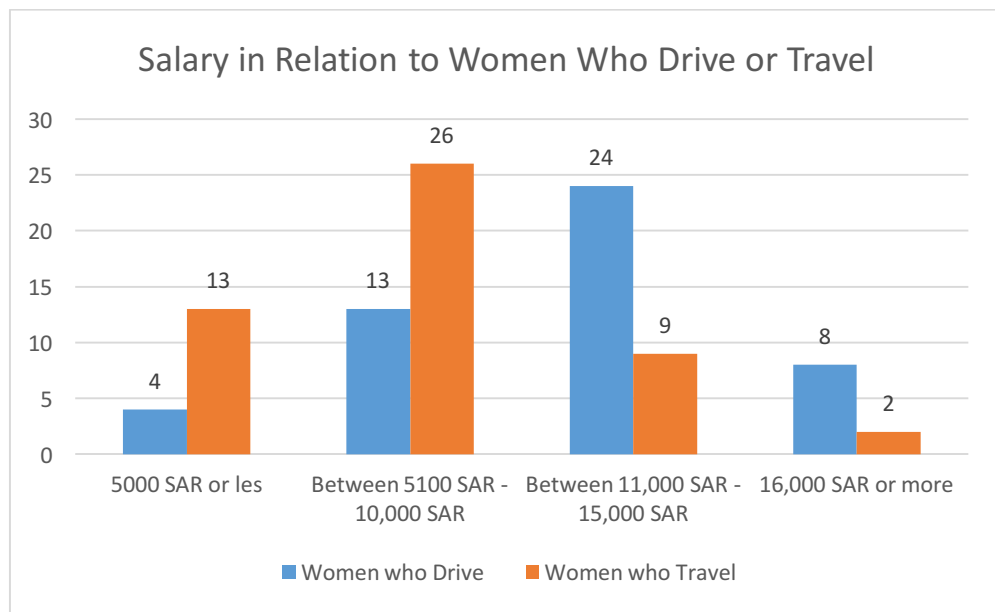


Figure 4.2. Salary in Relation to Women Who Drive or Travel

### 4.1.3. Education

The third character is the education of women in relation to having a driving license/owning a car or traveling with other transportation modes. The result of survey for employed women who drive turned out as the following; 3 out of 50 are high school or less, 12 out of 50 are bachelor degree holder, 26 out of 50 are master degree holders, 8 out of 50 are PhD holders. The result of survey for employed women who travel with other means showed that 24 out of 50 are bachelor degree holder, 15 out of 50 are master degree holders, 3 out of 25 are PhD holders, and 8 out of 50 are high school or less.



The results shown in the following Graph (Figure 4.3) indicates the difference in education between women who drive and women who travel with other means. Women who drive tend to carry higher education degrees than women who drive. Women who carry higher PhD degrees appear more with women who drive, while women carry have a high school degree or lower tend to appear more with women who travel.

The findings of this question corresponds to the findings in the literature by Vasudevan (2019), indicate that driving is associated with higher levels of education. It also supports the findings in the report by Al-Qarawi & Kamargiann (2018), which showed that 77% of women who have better spatial mobility had higher educations. In this question, almost 34 out of 50 have Master’s degree and above.

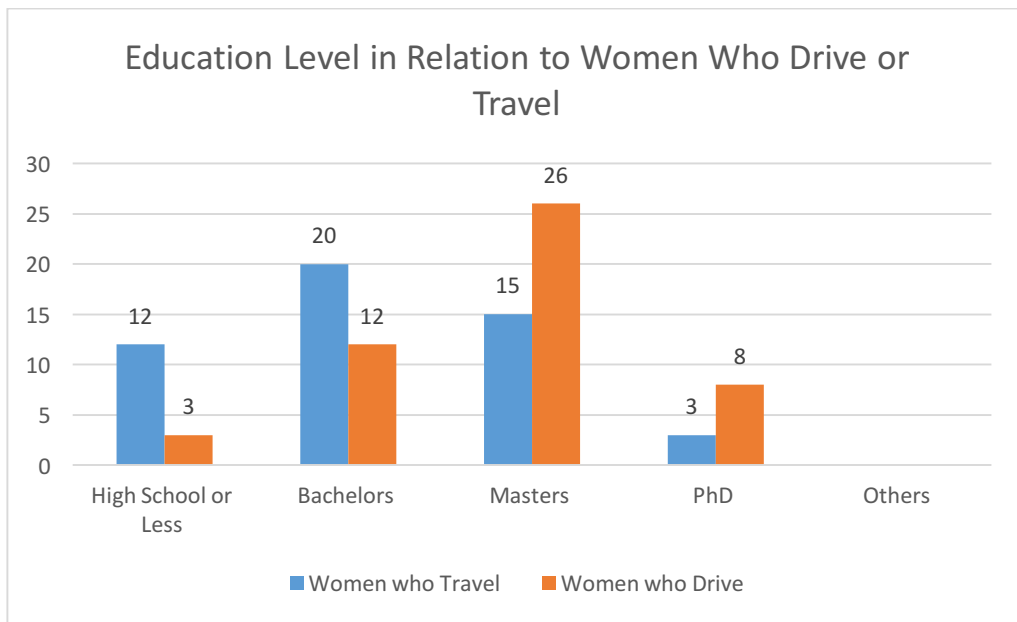


Figure 4.3. Education in Relation to Women Who Drive or Travel

#### 4.1.4. Marriage Status

The fourth character is marital status of women in relation to having a driving license/owning a car or traveling with other transportation modes. The marital status was combine with the presence/absence of at least dependent child. The survey result shown in the graph indicate women who drive to The results shown in the following Graph

indicates the difference in marital status between women who drive and women who travel with other means. The highest marital status for women who drive is with single, divorced, and widowed women with and without a dependent child. The conversation I had with women who are divorced or widowed revealed that being divorced or widowed made it harder for them to depend on a male relative such as a father or a brother for transportation. Therefore, gaining a driving license and owning a car helped them depend on themselves and be able to become more independent and to be able to support their families spatially and financially. The percentage of women who are married is higher in women who travel (Almost 21 out of 50). The conversation I had with women who are married and travel revealed that they tend to depend on their husbands for the all transportations. Women who are single tend to equally drive or travel with other means.

The findings of the survey support the findings in of Al – Qarawi & Kamargianni, (2018), they indicate that women who are married tend to travel more, while women who are divorced/widowed tend drive more. The findings of our survey illustrated in Figure. (4.4) shows that the highest percentage of women who drive is for divorced or widowed women with at least one dependent child. It contradicts with the findings of Vasudevan (2020) which indicates that women with dependent children tend to have more obstacles in spatial mobility than women who don't have any dependent children, therefore travel less.

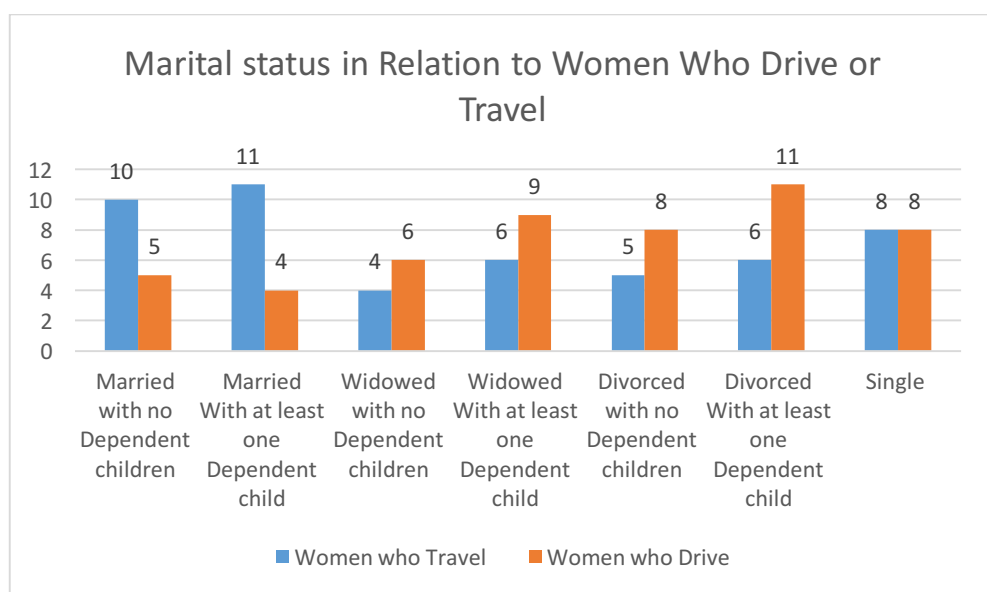


Figure 4.4. Difference in The Purpose of Trip

## 4.2. Characteristics of Spatial Mobility for Women

The second part of the survey inspects the characteristics of spatial mobility between women who drive and women who travel by other means to their work.

### 4.2.1. Purpose of Travelling

The third spatial mobility character is the purpose of traveling for women who drive or travel. In this question, women were asked to pick all the purposes for their trips. Trips related to leisure and entertainment tend to be higher for women who drive than women who travel (41 against 33). Trips related to household and escorting tend to also be higher for women who drive than women who travel. Trips that are related to government and official purpose are low for both women who drive and travel. Most probably because these tasks were mainly held by a male relative, and still continue to be that way. The findings of this question (Figure 4.5) contradicts with the findings of in the literature. Granbery, (2018) and Gauvin et al, (2019), indicates that women tend to have more household related trips. The findings of our survey found that women tend to have more leisure and entertainment trips than household trips (for both women who drive and women who travel). Perhaps because household trips have been carried on by male relatives for too long that it continued to be carried by them.

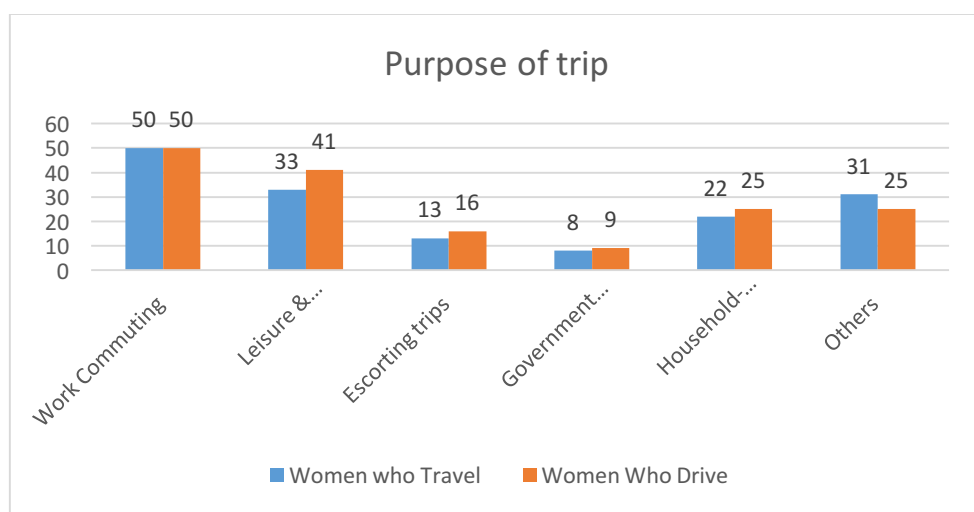


Figure 4.5. Difference in The Purpose of Trip

#### 4.2.2. Average Time Between Work and Home (One Way)

The second spatial mobility character is the average time spent between work and home traveled by women who drive or travel. The result of the survey shows that almost 27 out of 50 of the women who drive spend between 15 – 30 minutes from home to work, 11 out of 50 spend between 30 – 45 minutes to work, 6 out of 50 spend less than 15 minutes, and 3 out of 50 spend 45 minutes or more. As for the women who travel to work; Almost 14 out of 50 of women spend less than 15 minutes to work, 26 out of 50 spend between 15-30 minutes, 12 out of 50 spend between 30 – 45 minutes to work, and non-traveled for over than 45 minutes.

The average time spent between work and home for both women who travel and women who drive might seem similar, yet, when compared in relation to the travelled distance, women who drive are more advantaged. Women who drive go for longer distances with longer times, while women who travel go for less distances for longer time.

The literature presented in this paper only compares the commuting time between women and men only. This question compares the commuting time between women who travel and women who drive, but does not compare between men and women's commuting time. This research will carry on with an extended survey that will also investigate men's commuting time, and compare it with the current findings.

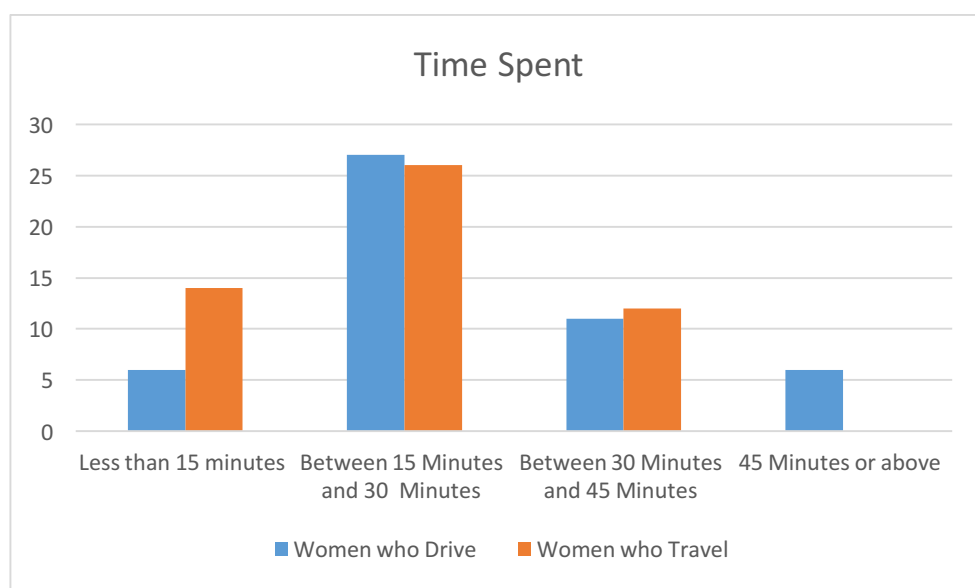


Figure 4.6. Difference in The Time Spent in Commuting

### 4.2.3. Distance Between Work and Home

The first spatial mobility character is the distance between work and home traveled by women who drive or travel. The result of the survey shows that almost 24 out of 50 women who drive go up to 15km – 30 km to work, 13 out of 50 women tend to drive up to 5 km – 15 km to work, and 11 out of 50 tend to drive above 30 km to work, and only 2 out of 50 drive for less than 5 km. On the other hand, almost 17 out of 50 women who travel go up to 15km – 30 km to work, 25 out of 50 women tend to travel up to 5 km – 15 km to work, and 0 out of 50 tend to travel above 30 km to work, and only 8 out of 50 drive for less than 5 km.

Women who drive tend to reach further destinations and work in further locations from home (15km and above). On the other hand, women who travel tend to work in closer locations to home. The significant difference is that none of the women who travel works in a location that is farther than 30 km from their houses, on the other hand, around 11 women can drive above 30 km. The differences in distance to work between the two categories can be due to differences in cost and time spent while commuting.

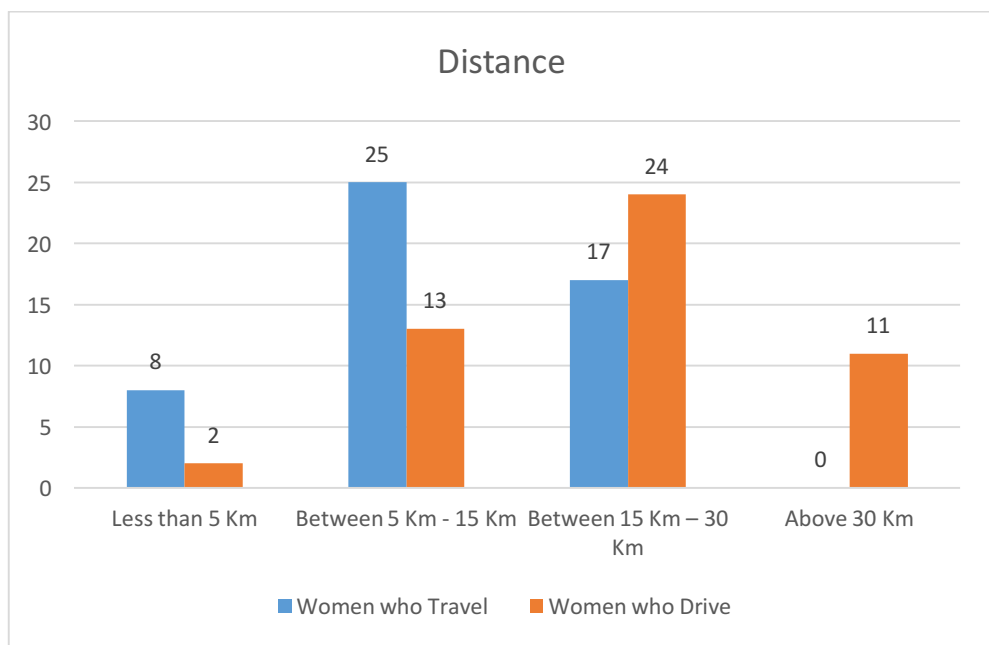


Figure 4.7. Difference in The Travelled Distance

#### 4.2.4. Frequency of Leisure and Entertainment Trips

The fourth spatial mobility character is the frequency of leisure and entertainment trips done by women who drive or travel. This question measures the frequency of trips for entertainment and leisure. As for the women who drive; 24 women out of 50 tend to be 4 or more times week for entertainment and leisure purposes such as visiting friends, sitting cafes, shopping in malls, Salon and beauty care visits, gyms, etc. 18 women tend to go for 2 – 3 times week, 5 tend to go once a week, and 3 tend to go once every two weeks. On the other hand, only 7 women who travel tend to go 4 or more times a week for entertainment and leisure purposes. 21 women tend to go for 2 – 3 times week, 17 tend to go once a week, and 5 tend to go once every two weeks. Women who drive tend to have more frequent visits to entertainment and leisure destinations which might indicate a more active lifestyle.

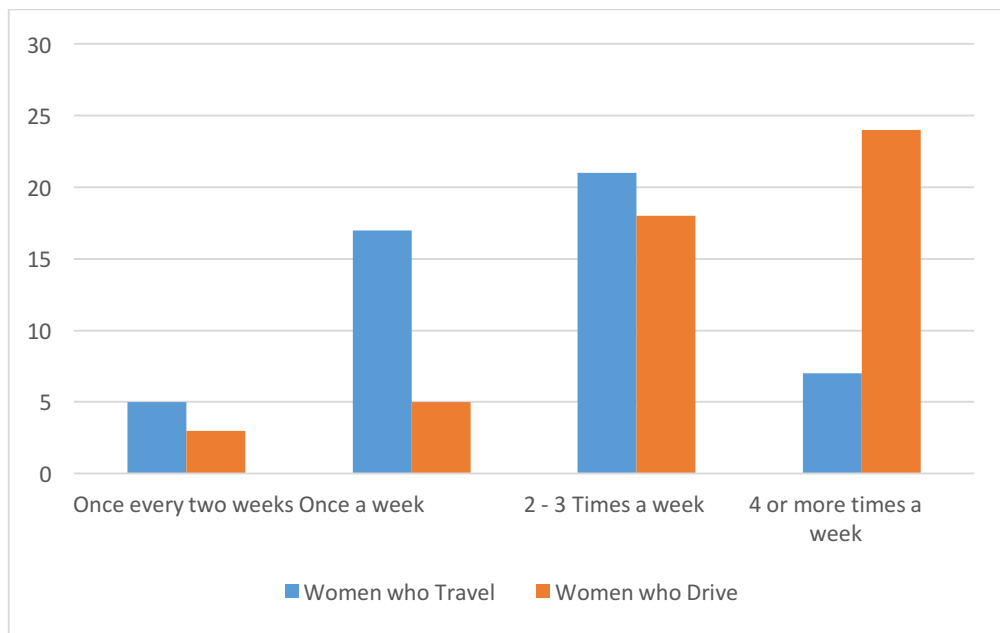


Figure 4.8. Difference in The Frequency of Leisure and Entertainment Trips

#### 4.2.5. Frequency of Family and Household-Related Trips

The fifth spatial mobility character is the frequency of family and household-related trips done by women who drive or travel. This question aims at measuring the frequency of household-related trips for women who travel and women who drive. The result shows that 30 out of 50 women who drive tend to have “5 or more times a week” household-related trips per week, while 14 women have 2-5 trips per week, and 6 women have one trip per week. On the other hand, 30 out of 50 of women who travel have “2 -5 trips per week”, while 12 out of 50 women have “5 or more trips” per week, and 8 out 50 women have one trip per week. The result shows a considerable difference between both women who drive and travel. Women who drive tend to have more frequent trips related to household than women who drive. It might indicate that driving allows women to share more domestic responsibilities than before (when the driving banned).

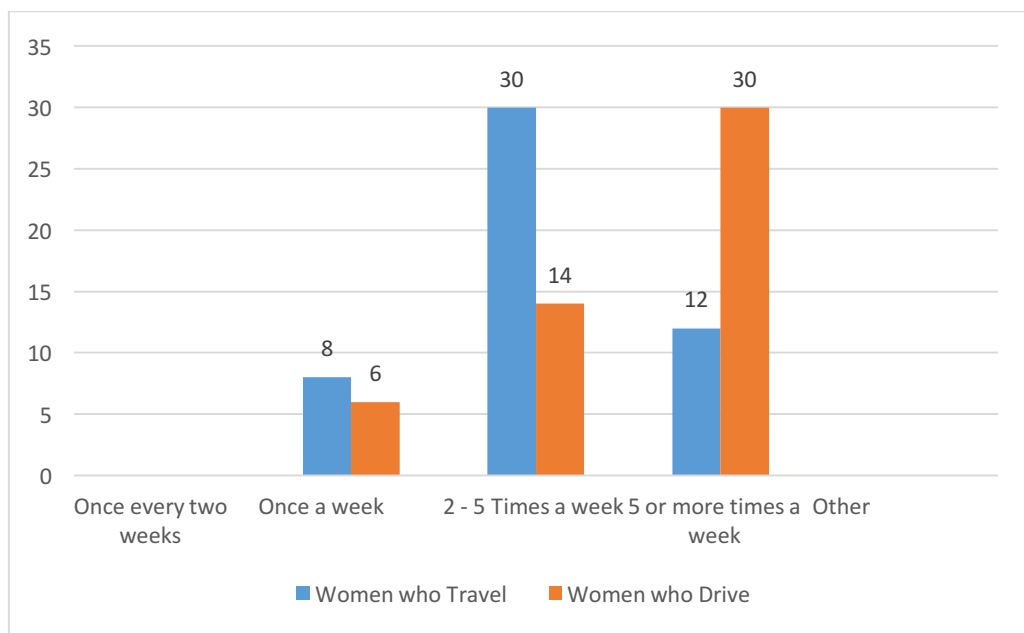


Figure 4.9. Difference in The Frequency of Household-Related Trips

#### 4.2.6. Number of Stops

The sixth spatial mobility character is the number of stops between work and home traveled by women who drive or travel. This question measures the number of stops women who drive and travel take on their way to/from work. As for women who drive, 24 out of 50 tend to have around 3 stops on their way to/from work. 13 tend to have around 3 stops, 10 tend to have one stop, and 1 tend to have 4 or more stops on the way. Women who drive tend to have less stops on the way; 29 out of 50 women tend to have no stops at all, 14 out of 50 tend to have 1 stop, and 7 out of 50 tend to have 2 stops, and non tends to have any 3 or more stops. The results show that women who drive tend to have more flexibility to have more stops on their way. The conversation with the women who had more stops revealed that the purpose of their stops was mainly for morning coffee, dropping children to nursery/schools, supermarket trips, and sport places such as gym, etc. Some of the women who had no stops at all indicted that it will cost them extra to stop on the way to work. Some women indicated that they don't stop on the way because the relative or driving who is escorting them to work would refuse to stop on the way.

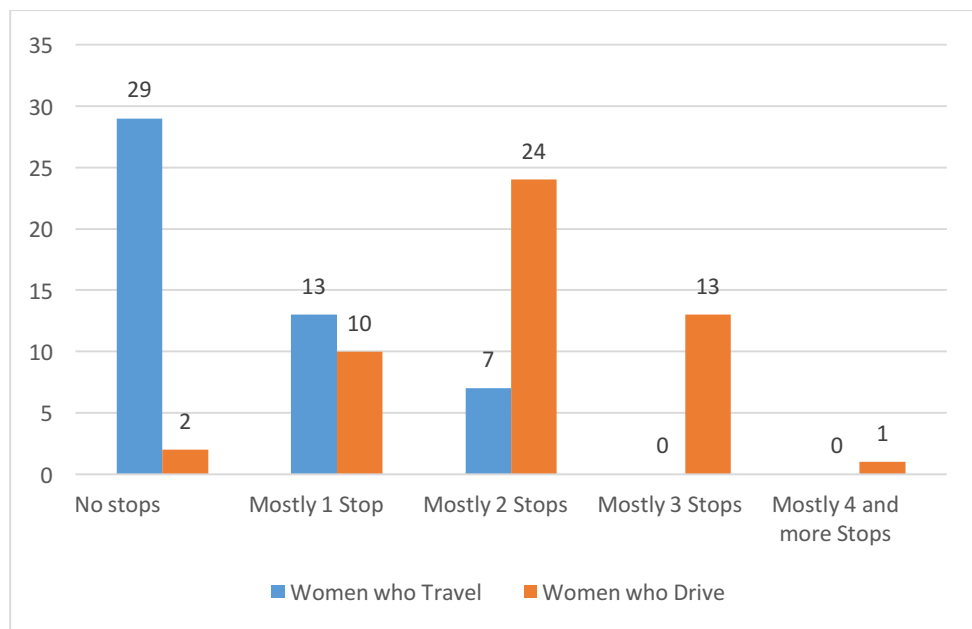


Figure 4.10. Number of Stops for Women Who Drive and Women Who Travel



#### 4.2.7. Cost of Transportation Per Month

The seventh spatial mobility character is the cost of transportation per month by women who drive and women who travel. As for the women who drive; 23 out of 50 tend to pay 500 SAR or less per month, 25 tend to pay up to 1000 SAR per month, and only 2 tend to pay up to 1500 SAR per month, and 0 pay more than 1500 SAR per month. On the other hand, women who travel paid much more, 12 out of 50 paid 500 SAR or less, 6 paid between “500 SAR – 1000 SAR”, the majority, which is 20 out of 50, pay between “1000 sar – 1500 sar”, and 12 pay 1500 sar or more. The difference in transportation cost between women who drive and women who travel is big. Women who drive have way much less monthly cost for transportation than women who travel. The conversation with women who travel to work revealed that they prefer to be escorted with a male relative in order to save the cost of a private driver. They also indicate that traveling with a relative can have some negatives such as differences in timing and scheduling.

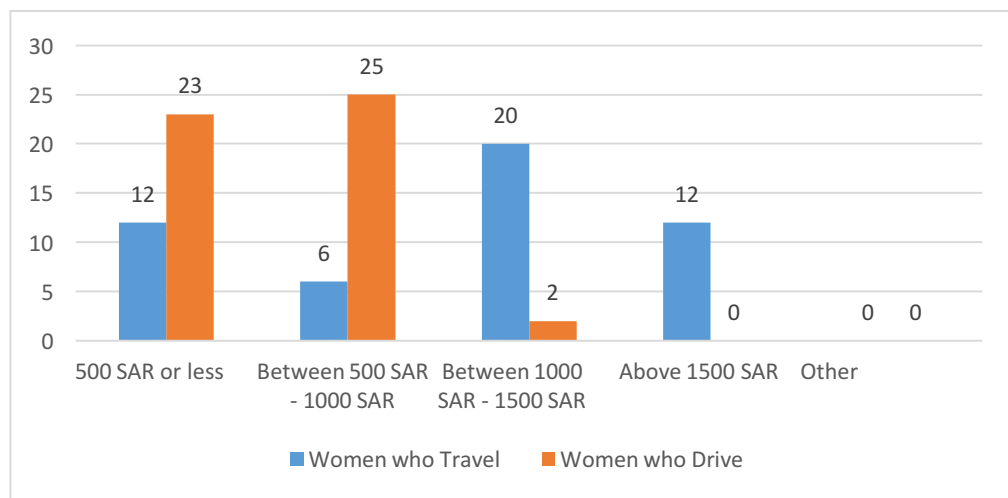


Figure 4.11. Average Salary for Women Who Drive and Women Who Travel

#### 4.2.8. Sexual Harassment and Feelings of Security

The eighth spatial mobility character is the frequency of the experience of sexual harassment for women who drive and women who travel. The results show that 11 out of

50 women who drive usually face sexual harassment, 11 out of 50 face it sometimes, and 28 face it rarely. On the other hand, 27 out of 50 of the women who travel usually face sexual harassment, 19 face it sometimes, and 4 face it rarely. The results show that women who travel with other means tend to face sexual harassment on a much larger scale than women who drive. The conversation with women who travel revealed that most of the sexual harassment appear when they travel with public transportation such as taxis or hailing service such as Uber.

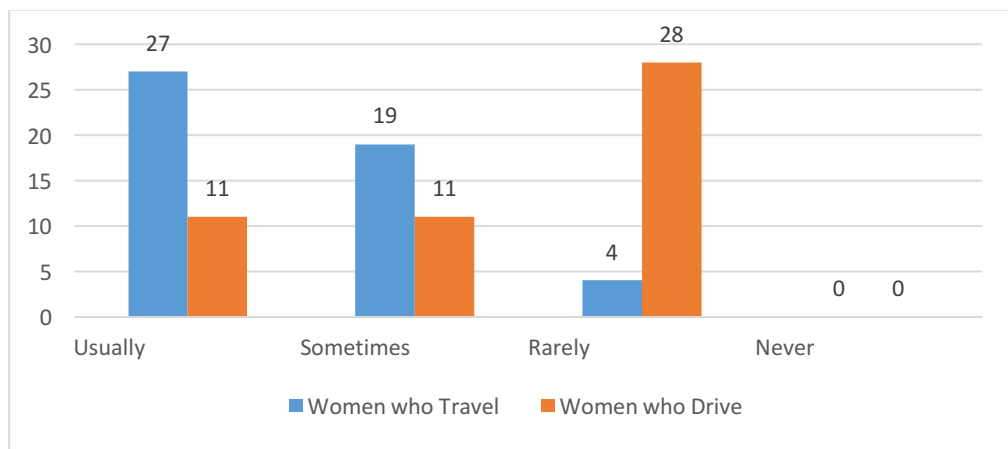


Figure 4.12. Exposure to Sexual Harassment and Feelings of Security

### 4.3. Findings and Summary

The survey aims at investigating the spatial mobility for women in terms of socio-individual characteristics of women who drive and women who travel by other means. It also aims at exploring the the characteristic of spatial mobility for women who drive and travel by other means The result of the first part of the survey investigates the social and individual characteristics of women who drive and women who travel by other means. It suggests that women who have a driving license and own a car tend to age between 25-40 years old, earn of salary that ranges between 11,000sar – 15,000sar per month, have higher degrees of education (mostly masters and Phd), tend to be mostly single or divorced, and tend to have children. On the other hand, women who travel using other modes of transportation tend to also age between 25-40 years old, earn a salary that ranges

between 5,000sar – 10,000 sar per month, and have higher education degrees (Mostly bachelors), and tend to be mostly married or single.

The results of the second part of the survey investigates the characteristic of spatial mobility for women who drive and travel by other means. It suggests that women who drive and women who travel tend to have different spatial mobility characteristics. Women who drive tend to have further distances between their work and home (between 15-30 km), they tend to spend between 15-30 mins between their work and home, they tend to spend less on their monthly transportation expenses (between 500 - 1000), and they tend to have multi-stops (between 1 – 4 stops), and tend to have more frequent visits to leisure, entertainment, and household-related destinations. They also tend to face less sexual harassment and have higher sense of security and safety.

On the other hand, women who travel to their work using other transportation means such as a private driver, family relative, etc, tend to have closer distances between their work and home (between 5-15 km), they tend to spend between 15-30 mins between their work and home, they tend to spend more on their monthly transportation expenses (1000 – 1500 sar), and they tend to have less multi-chaining trips (0 to 2 stops ), and tend to have less frequent visits to leisure, entertainment, and household related destinations. They also tend to face more sexual harassment and have higher sense of security and safety.

#### 4.3.1. Summary of the Characteristics of Women’s Spatial Mobility

Table 4.1. Summary of the Characteristics of Women’s Spatial Mobility

|                                       | <b>Adult Employed Women who Travel</b>   | <b>Adult Employed Women Who Drive</b>   |
|---------------------------------------|--|---|
| <b>Distance Between Work and Home</b> | The majority spend between 5-15 km between work and home<br>No distances to locations outside the city<br>More distances to locations within 5km | The majority spend between 15-30km between work and home<br>Distances can also reach locations outside the city |

(Cont. on next page)

Table 4.1. (cont.)

|   | <b>Adult Employed Women Who Travel</b>  | <b>Adult Employed Women Who Drive</b>  |
|---|---|--|
| <b>Average Time Between Work and Home</b>           | Highest time spent between work and home is 15-30 mins.<br><br>More women travel between 30-45  | Highest time spent between work and home is 15-30 mins.  |
| <b>Trip Purpose</b>                                 | Women who drive children tend to have lower trips related to leisure, entertainment, and household purposes.<br><br>Trips to governmental offices are the lowest, the reason might be the reliance on a male relative perform those tasks | Women who drive children tend to have higher trips related to leisure, entertainment, and household purposes.<br><br>Trips to governmental offices are the lowest, the reason might be the reliance on a male relative perform those tasks |
| <b>Frequency of Leisure and Entertainment Trips</b> | Women who travel tend to have 2 – 3 trips per week for leisure and entertainment trips  | Women who drive tend to have 4 or more trips per week for leisure and entertainment trips  |
| <b>Frequency of Household-Related Trips</b>         | Women who don't have any dependent children tend to have 2-5 trips per week for household purposes  | Women who have at least dependent child tend to have 5 or more trips per week for household purposes   |
| <b>Number of Stops on the Way to Work</b>           | Women who travel tend to have less stop on their trips to work, mostly due the extra cost   | Women who drive tend to have more stops on the way for multiple reasons such as grabbing coffee, dropping children at school, supermarket, etc.  |

(Cont. on next page)

Table 4.1. (cont.)

|  |  |  |
|--|--|--|
| <b>Cost of Monthly Transportation</b>                          | Monthly cost of transportation is between 500 sar – 1000 sar                                   | Monthly cost is between 1000 sar – 1500 sar and above.   |
| <b>Frequency of Sexual Harassment and Feelings of Security</b> | Women who drive have rare encounters with sexual harassments and have higher sense of security | Women who drive have usual encounters with sexual harassments and have lower sense of security |

#### 4.4. Interview Results and Discussions: Spatial Mobility and Accessibility for Women Before and After Driving

The second part will be about the interview results and discussion. The table below shows the data regarding the 6 ladies who had the interview. The information includes demographic ones such as Age, Marital Status, occupation, driving license, and origin country/nationality.

Table 4.2 . Interviewee Data and Information

|           | <b>Name</b>             | <b>Age</b>   | <b>Marital Status</b>                           | <b>Current Occupation</b>   | <b>Driving License</b>                                     | <b>Origin Country</b>                       |
|-----------|-------------------------|--------------|---|---|--|---|
| <b>#1</b> | <b>Raghad Bassam,</b>   | 21 years old | Single. She is currently living with her family | She is currently in her third year in Graphic design major of university. | 2 Years ago<br>She has her own car                         | Jordanian - born and raised in Saudi Arabia |
| <b>#2</b> | <b>Malakeh Al-Imam,</b> | 27 years old | Single. She is currently living with her family | She has a full time job as an Architect in an Architecture office         | She started to drive 1.5 years ago.<br>She has her own car | Lebanese - born and raised in Saudi Arabia. |

(cont. on next page)

Table 4.1. (cont.)

|           | <b>Name</b>            | <b>Age</b>   | <b>Marital Status</b>  | <b>Current Occupation</b>  | <b>Date of Acquiring Driving License</b>   | <b>Origin Country</b>  |
|-----------|------------------------|--------------|--|--|--|--|
| <b>#3</b> | <b>Amal Al-Badawi</b>  | 34 years old | Divorced and currently living with her 2 dependent children and                  | She is currently working as a full time Uber driver in Jeddah                                | She started to drive 1.5 years ago. She bought her own car by her self             | Saudi who was born and raised in Saudi Arabia                                      |
| <b>#4</b> | <b>Raida Al-Tamimi</b> | 41 years old | Married with 5 children, none of them are dependent.                             | She is not-employed  | She started to drive 7 months ago. She is currently using her husband's second car | Born and raised in Jordan, moved to Saudi Arabia after marriage                    |
| <b>#5</b> | <b>Maryam Al-Hasan</b> | 33 years old | Married and have one dependent child.  | Currently employed as an Architect in a multi-national architecture and construction company | . She started to drive 2.5 years ago and she currently own her own car.            | Born and raised in Morocco, moved to Saudi Arabia after her father got a job there |
| <b>#6</b> | <b>Rahaf Abu-Nejim</b> | 35 years old | Divorced with 1 child. Currently lives with her son, her sister, and her brother | Accessory maker and designer, and she runs her own business from home                        | She had her driving license from Jordan 15 years ago and had her car 2 years ago   | Born and raised in Saudi Arabia  |

#### 4.4.1. Patterns of Spatial Mobility for Trips Before Car Driving

The first question that was asked to the 6 ladies was to describe in their own words, in detail, all of their spatial mobility and experience in the city before driving. The aim of this question is to get an insight on the general patterns and behavior of their spatial mobility before being able to drive. The interview with the 6 women has revealed a similar patterns and behaviors for spatial mobility. Similarities included *limitation on spatial accessibility*, limited trip purposes, reliance on others, cost in terms of time and Money, lack of privacy, and difficulties in public transpiration.

##### 4.4.1.1. Limitation on Spatial Accessibility

The first similarity is the *limitation on spatial accessibility* and reachability to various locations in the city. Almost all the women expressed that their spatial mobility was limited to locations that are relative to their houses or their workplace or university. Locations that are faraway are usually only conducted with family members on occasional bases such as weekends. Most women expressed limitations on the number of stops they get to have on their way to work or school. Most of them had none stops to one stop only on their way to work or university. Having a stop on the way for coffee, breakfast, or for any other reason depended entirely on if the stop was directly located on the way to their destinations. For example, the spatial movement for Raghad Bassam was limited between house and university (Figure 4.13). Raghad's trips and destinations are pre-planned and the chosen routes are pre-defined and specific. Her most visited areas revolved around friends' houses who lived in nearby neighborhoods. *I could not join the gym, grab coffee in the morning, or drop off my sisters. I only went to my friends who had their house in my same neighborhood or in a nearby one. I could never visit any friend who lived in a further neighbourhood because it an Uber would cost a lot, and my brothers/father won't take me because it is a waste of time for them.*

Like Raghad, the spatial mobility for Malakeh al-Imam was limited between house and work. Her other visited nearby locations such as the shopping mall, restaurants, and cafes (Figure 4.14). Some women such as Amal Al-Badawi had almost no spatial mobility

at all (Figure 4.15) : *“I can frankly say that I only knew 20% of Jeddah at that time. I would spend my entire week at home, on the first day of weekend my husband would drive me to my parent’s house, and on the second day of weekend we would go to a shopping mall to shop and dine. So basically it is 2-3 roads that I know and I go through on regular bases.’* Her destinations were limited to family’s house on the weekends and to the nearby shopping mall. She expresses that her knowledge of Jeddah’s roads is also limited’. Her destinations are repetitive, relative to the house, and expected.

On the other hand, women who were hiring private drivers had no major differences in the patterns of their spatial mobility. For example, Raida Al-Tamimi was one of the women who had a private driver who stayed with her 24/7. It allowed her to have spatial trips that are vast and included many different locations in Jeddah. The pattern of her trips were not repetitive and included frequent new locations and destinations. Her trips before and after gaining driving license is almost the same (Figure 4.16). She indicates:

*‘I am a very social person, and I am also interested in interior design as well. That is why most of my trips are to my friends’ houses (no matter how far or close they are). I also go to a lot of furniture and concept stores, the old and the new ones (no matter how far or close they are). I never felt restricted when it comes to spatial mobility because I have always been able to go whenever I want wherever I want.’*

The limitations on spatial mobility had direct impact on the location of possible job opportunities for some of the women. Maryam Al-Hasan was one of the interviewees that had to limit her search for a job within locations around the house and relative to her neighborhood (Figure 4.17). This spatial limitation impacted the quality of her job opportunities: *‘I had a full time job near to my house and my husband used to drop me off and pick me up from the work. That job was acceptable but did not fulfil my dream nor my ambition. There were many companies that I wanted to work at but they were too far away or they required driving license for site visits.’*

#### **4.4.1.2 . Limited Trip Purposes**

The same case was with Rahaf Abu-Nejim who could only go outside her house with a family relative such as a husband to very limited locations such as family houses



and nearby parks (Fiure. Rahaf describe her limited spatial experience: *‘I used to spend most of my time at home, and only get out on the weekend. Every weekend, my husband would drop me off to my family’s house, and then we would go for a long picnic by the beach in a remote area out of the city. That is all about it’*”.

#### **4.4.1.3. Reliance on Others**

The interview also revealed that factors such as money, the availability and the free time of a male relative, the ability to order an Uber have an impact on the spatial mobility for women. Raghad’s commuting to university was handled by a private driver, while other transfers were handled by her father or 2 brothers. Depending on her male relative for spatial commuting paralyzed her movement because she had to coordinate her trips with their availability and free time. The women who dependent on other modes of travel such as Uber, male relative, or a hired driver expressed low level of freedom for women. Raghad expressed that her travels has to align with her father or her two brothers. Some of her plans sometimes could be cancelled because of the unavailability of her male relatives. Rahaf was one of the women whose trips were completely dictated and control by her husband, which impacted her over all spatial mobility.

Driving with a private driver can also effect the level of freedom of their behavior while commuting. For example, Raghad expressed that she has to act in a different manner and pay extra attention while she is commuting with the driver: *“I also had to pay extra attention over my behavior and the way I dress while I am in the car with the driver”*. Some of the women expressed the need to speak in a certain tone while being with a stranger driver, just to make themselves feel safer and more secure.

#### **4.4.1.4. Cost in Terms of Time and Money**

A third aspect is the waste in time and money. Raghad expressed how the delays by her driver can make her lose a lot of time (around 40 mins per day). *“It was very frustrating because of the amount of wasted time; in the morning I had to leave 25 minutes earlier from my house because the driver had no availability to pick me up on time. He was also usually late when he picks me up after university (around 8-12) minutes.”* On the other hand, Malakeh also expresses the same concern regarding time loss due to

ordering an Uber: *“I really disliked using Uber for several reasons. The first one is because it wastes a lot of my precious time while ordering and getting an Uber. Sometimes they cancel the trips, sometimes there are no nearby Ubers so I have to wait”*

#### **4.4.1.5. Difficulties with Public Transportation**

When the women were asked about “How would their daily trips change if you were to take public transportation instead of driving your own car? The answer from most of the ladies were almost the same, Raghad’s answers summarizes it as the following:

*“First of all, I never use Taxis because they are not safe or hygienic, and the drivers usually don’t speak good Arabic so it can be hard for me to communicate with them properly. The only possible transportation would have been Uber or hiring a private driver. For example, I would not be able to pick or drop my sister from school, we would have hired a private driver for her and that would add a lot of financial burden on us. I am sure 100% that I would not be able to go to the gym as well because it will add a financial burden on me. I won’t be able to hang out with my friend’s after the university. I really can’t imagine my life without my car, it is like a small portable house for me and for my family. Public transportation such as Taxis and Uber are very costly here, and we don’t have any other public transportation options.”*

The interview also shows that some of the women who can’t afford hiring a private driver and cannot depend on a male relative tend to use carpooling with Uber. Malakeh usually uses Carpool option which allows her to pick someone else with her to share the ride cost. It is a good option that saves money but it takes tremendous amount of time. She also does not find it convenient because it exposes her to different people every day, some are respectful and some are not. she also dislikes it because sometimes she gets involved in situations that she doesn’t want to be involved in. For example, sometimes Uber drivers would pick up a fight with the rider, and she get annoyed and she don’t know what to do.

#### **4.4.2. Patterns of Spatial Mobility for the Trips After Having a Driving License**

The second question that was asked to the 6 ladies was to describe in their own words, in detail, a typical daily trip? (What time, which destinations, how long do they stay, how long travel time). The aim of this question is to get an insight on the general patterns and behavior of their spatial mobility after being able to drive. The interview with the 6 women has revealed a similar patterns and behaviors for spatial mobility. Similarities included *increased spatial accessibility*, multiple trip purposes, self-reliance, better time and money utilization, and better freedom and privacy. The answers for this questions revealed that the The patterns of women's spatial mobility after gaining their driving license and getting their own car is very different than their patterns without a car.

##### **4.4.2.1. Increased Extent of Spatial Mobility**

Women in the interview indicated wider and better spatial mobility extents. Most of the ladies expressed that they could commute to further locations and destinations in the city. Trips are also more frequent and spontaneous, for example Malakeh explained how she can move more freely during her working hours to go for shopping, having lunch in a nearby restaurant, or finish few tasks. It also allowed her to reach further locations for leisure and having fun such as the water front, hiking trips in the mountains, and further entertainment destinations.

On the other hand, Amal's spatial mobility expanded from visited limited areas in Jeddah to visiting almost all destinations in Jeddah given her new work as an Uber driver. This was her answer when asked about the details of her daily spatial mobility:

*"It is a very interesting question because I spend the whole day driving and moving people from one point to another. So I start my day by dropping my kids to their school. After that I grab a cup of coffee and I start my day. I work between 8 until 2 and then I head back to pick up my kids from school. Sometimes we might go for lunch outside or sometimes we might go home for lunch. At 5-6 I head back to my work."*

Amal's ability to drive a car allowed her to gain a new job as an Uber driver. Therefore, it allowed her to expand her own spatial accessibility and exposed her to new

locations and areas in Jeddah. On the other hand, women like Raida Al-Tamimi who was already depending on a private driver did not expand their spatial mobility even after gaining driving license and driving their own car. She still depends on her private driver for some trips that are unfamiliar to her, or for any other reason. She still perceives that traveling with private driver is safer, more convenient, and more comfortable.

On the other hand, Maryam Al-Hassan had a dramatic change in the extent of her spatial mobility. She used to be bound to work next to her house due transportation limitation. After she gained her driving license and car, she found a job opportunity in another city that offered much better salary and overall work experience. Her travel pattern changed from 5 minutes on the way to almost an hour on the way. She indicates that "it would have been impossible for me to go if I was not able to drive, because hiring a private driver could have consumed half of my salary." Her new jobs require a lot of movement between site/project visits, material shops, other construction offices, etc. She indicates that The flexibility and the freedom that she got from her spatial movement helped her have a promotion in her work as well.

Some ladies were able to start an entire home business that they can rely on financially. Rahaf started a home business after her divorce. Her previous spatial mobility was extremely limited and controlled by her husband. Now she delivers her products to almost all neighborhoods in Jeddah. She was also able to find Her new freedom makes her feel content and self-reliant: a part time job on a middle of the city:

*Every day's journey is a different and an exciting one, it depends mainly on my products and sales. In the morning I start by dropping my son off to his nearby school, and then I head to my part-time job as a librarian on the other side of the city. I get out of my work at 1 and head to my son's school to pick him up. We go home and rest for couple of hours, then I prepare all the purchases of my accessories and head for delivery. I know the city very well because I deliver to most locations even to nearby cities.*

#### **4.4.2.2. Self-Reliance**

Most interviewed women became self-reliant after being able to drive. Rahaf was able to build a business on her own and drive her own son to school without the need for anyone to do so for her. The same case for Amal who starts her day by dropping off her

kids to school on her way to her work which allowed her to save the cost of the private driver. Raghad and Malakeh were able to drive themselves to school/work without the need to rely on a private driver any more. Raghad used to depend on the availability of her friends to go out after university time, but now she is the one who drives to anywhere she wants after school or during school time. She was also able to drop her sister and neighbor's daughter to school on her way to work.

#### **4.4.2.3. Multiple Stops**

One of the main changes in the patterns of women's spatial mobility and accessibility was the number of stops on the way. Women like Malakeh and Raghad who used to have regular trips to their work or school did not have any stops on their way. They used to go one way back and forth between their destinations. To have a stop on the way would be difficult sometimes due to several reasons, could be for an extra cost, could be that the stop location is not on their way, and could be that the driver himself refuses to stop. Raghad's stops on her way to university included stops at her sister's school, gym, local café, and to pick up another friend. After university she would also hang out with her friends:

*“After my university I usually hang out with my friends after university, we go for lunch or Kunefe “Jordanian traditional sweet”, or sometimes we go to the waterfront, to a nearby park, or to Stars Avenue mall to shop and eat there ... We always use my car for after university trips and I am very grateful for it because it is really fun and enjoyable, and we don't have any restrains on time, distance, or destination. After that I either drop my friends at their houses or to the nearest bus station.”*

Malakeh expressed that her stops on her way increased from no stops to 2 stops at the café and the breakfast place. She perceives the ability to stop wherever and whenever she wants as a luxury, she could not do this before when she used to take Uber to work. When we asked her why, she said that it was because of “the extra cost for these stops, sometimes I don't feel comfortable with the driver so I just want to arrive to my work with minimal interaction with him.”

#### **4.4.2.4. Freedom**

Raida's ability to drive a car freely was controlled in the beginning by her husband who had concerns over her safety. Women were still very cautious in the beginning but with time their urban visibility started to become a common sight on the streets of Jeddah. Raida explains about her journey:

*My husband did not agree in the beginning for me to have the driving license because he was scared that the public was still not safe for a woman to drive alone. After one year he started to become more accepting for idea as he started to see many driving women on the streets. I took my driving license and I started to drive my husband's second car. I was still scared and could not feel safe on my own in the public, therefore the driver/my husband would always have accompanied me with all my trips. Only 1 month ago I started to drive alone on my own. In the beginning it was only around the house but now I go to further areas. My spatial movement and traveling purposes were very limited. I only go to places that are very familiar and well known to me, which are the same areas that I used to go with my driver before. I use the same roads that I know, and I never try to change or discover any new road or place unless someone was with me. I never go out at night time so I am self-restricting myself to driving at day time only, and this is because of my fear of being harassed by someone or by getting lost (I am not a good google map reader!). My regular trips revolve around going to my friend's house, going to the mall, the nearby salon, or to the market to do grocery.*

On the other hand, Rahaf and Amal gained their freedom after they both were able to get divorced from their inconvenient husbands. Having a car helped them significantly gaining their personal and spatial freedom, it allowed them to rely on themselves in terms of income and financial stability.

#### **4.4.2.5. Time Utilization**

Gaining spatial freedom also allowed to women to save time and utilize it better. Raghad indicates that she was able save herself around 45 minutes daily. She indicates:

*“A private driver handled all my transfers to and from my university. It was very frustrating because of the amount of wasted time; in the morning I had to leave 25 minutes earlier from my house because the driver had no availability to pick me up on time. He was also usually late when he picks me up after university (around 8-12) minutes.”*

On the other hand, Malake was able to benefit from her one-hour lunch break at work to go outside and get few things done such as paper work, running errands, etc. It helped her save and utilizes time in a better manner. For Maryam, having a driver license and being able to drive allowed her to have a job in another city, which added more cost in terms of time. But she was able compromise it for the salary and prospect of that job.

#### **4.4.3. Perceptions on Avoidable Areas and Preferable Areas**

The third question asked to the interviewed women was *“What is your idea about an avoidable area and a preferable area to be present in?”* The answers for the women were diverse but all revolved around the same factor: Personal safety and security.

##### **4.4.3.1. Locations Relativity to Home**

Almost all women indicated that they prefer locations that are relatively close to their homes or to their workplace locations. Raida emphasized that her trips are very familiar and relative to her house and neighborhood. Her trips are fixed to her friend’s houses, her favorited furniture shop street, or her favorite Mall. She would avoid riding for long distances all together. Raghad expressed that her trips are usually repetitive and revolve around university, friend’s houses, nearby grocery shop, nearby café. I also tried to understand from the interviewed women about their definition of “relative and far locations”, and the answers were diverse but all revolved around 15-20 kilos around the house. Most of them expressed that further locations are not preferable to them. On the other hand, ladies who had a work that depends on their spatial mobility, such as Amal, Rahaf, and Maryam find relativity to the house not a big problem to them, as other aspects are more important to them. Amal who works as an Uber driver indicates that driving to far locations are is a problem for her. Her main concern though is the type of the location that she is going to and the level of safety in that area. Maryam who works as an office

that is in another city, also finds no problem with traveling to further locations. On the contrary she finds it beneficial for her as traveling for longer distances allows her to have better field visits, which helped her to have a promotion at her work. She also expresses that she doesn't feel threatened at all on her way to work, because the streets is full of surveillance cameras all along the way as well as police cars. She emphasizes that her main concern is people 'mentality and acceptance, she elaborates:

*“Well, the nature of my work made me quite resilient to the many dynamics of the public sphere. I have been to all kinds of places and locations such as Industrial areas, deserted areas, remote constructions sites, and slums. I don't mind going early in the morning or late at night, it makes no difference to me. The only thing that I dislike is the mentality of the people that I meet sometimes, it can be very intimidating for men (and sometimes for women) to see an independent fearless woman who have a limitless access to all parts of the city.”*

#### **4.4.3.2. Industrial Areas**

The interviews revealed that women avoid areas that are male dominant and has no diversity. The interview with Malake revealed that her workplace location is located next to an Industrial area, and that she prefers to avoid going through that area, so she have to go around it in order to reach my work. When I asked her about the reason of avoiding this area, this was her answer:

*I know that I will not be physically harmed, but these areas are male-dominants and usually has no surveillance, I am worried that my car would crash in and I would be in a position of discomfort. It takes an extra 8 minutes to do so but it is safer for me. In the morning that area is male-dominated and in the evening it is empty and deserted. I feel more comfortable and safer that has diversity of people such as residential neighborhoods and entertainment areas. I also prefer areas with wide streets, good lighting, and good surveillance.*

The same concern was emphasized by Amal who works as an Uber driver, she would decline any order to go to the or through any Industrial area. She indicates:

*“I get a lot of orders per day for very different locations, and I usually accept most of them, but there are specific locations that I don't accept to go to. These locations are usually the outskirts of Jeddah, the industrial areas, the slums*



*(usually the entire southern area of Jeddah), the areas around the downtown, the Falestine road (a famous area with hundreds of phone shops that is usually dominated by men), the Manamah road (a famous area with hundreds of car-repairing garages that are dominated by men). All other locations are acceptable to me and I don't even mind going to the airport or to a different nearby city such as Taif. The main concern that I have when I drive is my own personal safety so I avoid going through a route that is unfamiliar with me."*

Rahaf who delivers her own products also expressed that she avoids delivering to neighborhoods in the far south because most neighborhoods there are slums and not safe. Sometime if she gets a really good order that requires her to go to a non-preferable neighborhood than she takes her son with her, as he adds a sense of security to her. She also avoids the area next to the waterfront and to the business area because they are very busy and always crowded. she also avoids Falestine road (a famous are for phone shops, usually male-dominated.). She also avoids neighborhoods that does not has good lighting such as the neighborhoods to the East or to the far North.

#### **4.4.3.3. Parking Lots**

While having the interview with Raghad, she also referred to her preference to be in a location that has diversity. She avoids places that are male dominated. she emphasized that one of her main challenges was "parking lots". Mainly because it is usually deserted, isolated, and lacks surveillance which makes her feel threatened, especially in an environment that is "*still new to women's presence on the streets.*" She generally aims to find open parking lots over closed, underground, or roof parking lots. She don't prefer the underground parking lot because she have been harassed several times by groups of university students and it was not comfortable for her. Even though that there are surveillance cameras everywhere but the lack of guards made her lack the sense of security to that place.

#### **4.4.3.4. Old Neighborhoods/Slums**

Most of the interviewed ladies expressed their preferences for newer neighborhood that has good lightning and wide streets. They dislike driving in the dark or in deserted areas. The main aim is to make them feel visible and more safe. Raghad indicates:

*“I would avoid the downtown and all the nearby neighborhoods (such as Ghulail, Al-Balad, Al-Hindawyah, Al-Jamaa, etc), because I don’t feel safe there at all even if it was in mid-day. The main reason for why I avoid it is safety, these locations don’t not have proper urban planning and most of them are very old neighbourhoods/ slums with many unregistered/non-legal inhabitants, I don’t trust how will they deal with an alone woman who is driving through their neighbourhood. I also don’t know how to drive in very narrow and zigzag roads, that is why I avoid it all together. I would rather take a longer way to my destination than to go through neighbourhoods or locations that I don’t feel comfortable or safe going through.”*

The interview showed that concerns of safety differs between woman to a woman, depending on the nature and requirements of their lives. Raghad indicates that the society is still not ready to give a lone woman her safety on the road: *“I also avoid driving in the dark, what if my car broke in the middle of street? I don’t think that people are fully ready to be respectful to a woman who is alone with a broken car in the middle of the night, and without a man”* Other women whose to conceal their visibility on the streets to give themselves a more sense of security. Raida indicates that she used window black shades on her front and back windows in order to conceal her public visibility on the streets. It was also to add more protection for herself and to lower her public visibility. She indicated that she is still not comfortable with answering any questions from other drivers (for example asking for directions, etc).

#### **4.4.4. Disturbing Events/Experiences in Urban Space – While Driving**

The fourth question that was asked to the ladies was to describe, in their own words, one of the most disturbing events/experience that they had while they were driving? The answers for their experiences will be quoted her one by one.

#### 4.4.4.1. Lack of Security Presence

The unpleasant experience for the interviewed woman Raghad and Rahaf revolved around being followed by a stranger while driving. As for Raghad, she was followed by a stranger while she was dropping her sister off to school. To her, what disturbed her the most was her inability to protect herself or her sister from that threat. He indicates that perhaps more surveillance and security police presence would have prevented the man from following them.

*“I think one of the most disturbing experiences that I had was while I was dropping my sister off school. We were on our way from the house to the school, when a drunk young man (in his 20s) stood started to follow us and tried to hit my car from the back. My sisters were terrified and I did not know what to do but to continue driving. I was so scared that I kept driving because I did not want him to know the location of my sister’s school. I continued driving until I lost him in one of the traffic lights. The happy news is that my sister was recording him the entire way. I dropped my sisters to the school and went directly with my brother to the police station and reported him and submitted the video. They never called me and I don’t know if they found him or not, but I wish if there was a public surveillance camera that could have easily record and catch him. I don’t know what to do if I experienced the same incident again and I don’t know what should I do to prevent it.”*

Rahaf’s Experience is almost the same, she was followed by a stranger while she was delivering one of her orders to a customer. The customer’s neighbourhood was far south, and she had to ask someone for directions, but after 2 minutes she realized that the person she asked for the directions started to follow her with his car. she was terrified because the neighbourhood was very dark, far, and there was no one around that can help her. She kept moving and he kept following her around until she saw a man and asked him for help. That man stood with her until the other person went away. She emphasizes that the location and the neighbourhood had nothing to do with her unpleasant experience, but it was more about the mind-set and mentality of the people who are in that location.

#### **4.4.4.2. Urban Space Not Prepared for Women's Lone Presence**

The second interviewed woman was Malakeh, she was coming back from her work and she went through the Industrial area. Her car broke in the middle of the Industrial area and there was no one around to help her. She expresses that the area was dark and empty and no one was passing by. She expressed how she freaked out: “ I called my family to come and assist me. I entered my car, turned off the inside and the outside lights, locked the doors, and just stayed quietly until my brother arrived and helped me out. Even though our government and society is very supportive for women's driving, yet there are areas in Jeddah that are still not prepared to achieve safety for traveling women. Unfortunately, we don't even have female police officers that can help when needed.” The lack of female police on the streets, especially in industrial areas could be a contributor to an unpleasant experience for female drivers. More effort should be put to equalize the social presence in an urban space in terms of sex, race and ethnicity, financial level, and background.

#### **4.4.4.3. Lack of Security and Surveillance on Traffic Lights**

The third interviewed woman was Amal, who works as an Uber driver. She had an unpleasant harassment experience while she was dropping off a client in the southern neighborhoods. She was harassed by a man who tried to break into the car while she was standing in the traffic lights:

*“ I was standing on the traffic light, a man came next to my door and tried to open it, it was locked of course. I could not move my car because I was stopping at the traffic light, I was terrified that he would try to break the window, but instead he took off his pants and started to knock on the door. Surprisingly none of the people around me tried to help me or to pull the guy away. The lady with me was terrified to the core and I am thankful that she did not try to open the door and run away. Anyways, the traffic light opened and I left. I never went back to that place again in my life. I tried to report what happened to a nearby police station, but apparently the surveillance camera in that traffic light was not working properly so we could not catch the man.”*

Regardless of the several interpretations for why that man did what he did “mental

illness, etc.”, there must be some kind of surveillance and over all culture that would minimize such accidents from happening. Traffic lights, and any other temporarily stopping area are vulnerable locations for women in the urban space. Same concern was expressed by the fourth interviewed lady Raida, who feels the need to be on guard every time she stops by a traffic light.

The experience of the fifth interviewed lady Maryam took an unexpected turn. Her unpleasant experiences included feeling uncomfortable in the presence of a police officer who pulled her off while she was heading to her workplace. I quote her experience as the following: “One of my weirdest and most disturbing evens was when I was pulled off by a police officer on my way to work. I was a driving a bit faster than I was supposed to. He stopped me, then came next to my window and asked for my ID, driving license, and gave me a charge of 450 Sar. Then he started to ask me questions about my destination, my work, my house location, my marital status, my family. I was a bit nervous because the conversation was getting too long and he seemed to take advantage of his status as a police officer and my status as a lone woman in the middle of the road. He asked me to get out of the car and come with him to the police station. I objected and told him that I am late at work and that I have my child with me and that I can come later to the police station. While he was insisting I received a phone call from my work and I picked it up very quickly, the police officer got nervous and told me that I can go! That was so scary because I felt so weak, who would believe that a police officer would put me in such position, when he was supposed to make me feel safe and secure!”

#### **4.4.5. Impact of Driving on the Over-All Health and Well-Being**

The last question which was asked to the interviewed ladies was about *How did driving impact their overall health, well-being, and life quality.*

The first interviewed lady Raghad, indicates that Her spatial mobility was very limited before having her driving license. It was restricted because the only transportation option she had was the private driver which was extremely expensive. She did not know many areas and neighborhoods in Jeddah but the areas around her university and her own neighborhood. She could not participate in many cultural and social events that took place in further areas/neighborhoods. She feels very grateful because she is not being a burden

on any one, she feels useful to her family by escorting her sister to her school (*which makes them spend quality time with each other*). She feels more confident and in-control

On the other hand, Malake expresses how driving allowed her to be very punctual when it comes to time. She used to stress out every morning before She go to work because ordering an Uber would be very challenging, because sometimes when there are no available Ubers, sometimes they are very far away, and sometime they cancel their trips. It was a serious concern of her and it gave her a lot of anxiety and stress. Now she expresses that she is happy and relieved because she has full control over her time, therefore a full control over her morning mood as well.

The 6<sup>th</sup> interviewed lady Rahaf expressed great pleasure while describing how driving changed her life, completely. She used to depend on her husband for everything, as she doesn't "remember going out without him in 16 years". This dependency impacted her outdoor personality; it made her a very shy person that is scared of exploring or going out of her ways. She expressed her perception about the city as the following: "The image that I have for the city is very fragmented, and the places that I know stand-alone out of context. I was not aware of the street and roads that leads to these places. I had no understanding for the personality of the city and I was not aware that I was never connected to the city itself. I was always confined to the indoor sphere, while the outdoor sphere was known and foreign. Unfortunately, I was not happy with my husband and I had to find a way to support and secure myself financially before I ask for divorce form him. I had my driving license 15 years ago, and my sister supported me by gifting me a used car so I can use it whenever I need. So I started the accessory business by secret, and I started to deliver all the products to customers also by secret, my husband did not know anything about it. He used to go to work from 8 AM until 8 PM, so I was able to manage hiding it from him. After 2 years my business grew and I became confident enough to ask for divorce from my husband and to move to the next stage of my life. It was not easy in the beginning to be honest because I had to depend on myself with everything, but then I moved in with my brother and sister and it became easier". Gaining her driving license and starting to drive changed her personality tremendously. She started to become more brave and secure about being out of her comfort zone. I quote from her about her own personal development: "I allowed me to expand and try new things (even in my personal life choices). I have more control over decision making and problem solving. My days are more productive because I don't have to align my plans with my anyone's plans anymore. I have more freedom now as I have full control over my time, I can go and

come whenever I want however I want, and it feels empowering. I was never really aware of how much incapable and confined I was until I was spatially free. I also feel happier and healthier.”

As for the single mom Amal, her ability to drive a car helped her stabilize her financial life and be self-reliant, and sustain herself, her 2 kids, and her mother. She took a loan to buy a car, and then she started to pay that loan from the money she was making from working as an Uber. The impact on her personality was also worth mentioning. She expresses that “this was the first time in my life that I feel strong and powerful, and that I can have total control over my life. I was very scared and broken when my husband left me and the kids, but God closes a door and opens 10 other doors. Now I am fully supporting myself, my two kids, and my mother. Driving also released me from the financial burden that I had because of my friends and me from. We are planning to open a small home business as well, sometime in the future.”

Raida was one of the ladies who’s driving a car and gaining a driving license did not have a magnificent impact on her life quality, personality, or perception of the city. Therefore, when asked about how did driving impact her life, she answered that it did not add much, but only gave her the pleasure of driving and using a car whenever she wants. As for Maryam, being able to drive changed the prospects of her professional life and career. She was able to find her dream job in another city and pursue it. The biggest impact was also on her personality, as she is an active person who was paralyzed with the limitation of Uber and public transportation. She elaborates as follows: “By nature, I am a very outgoing and courageous woman, I love challenges and new experiences. Being dependent on others for spatial mobility such as Uber, taxis, private drivers, or family members paralyzed me and prevented me from achieving my full potential. I remember being anxious and nervous most of the time because of the amount of delay time and money that I used to waste. I think that I spend around 40%-50% of my daily time in the car running from one point to another. The job that I currently have is only possible because of the car that I have. The strength and self-confidence that I gained had a very positive impact on my family as well. Many of the women in my family gained their driving license and started to drive.”

#### **4.4.6. Findings and Summary**

The interviews were informative because they gave a clear understanding for how driving impacted the quality of women's lives. All the 6 ladies' express dramatic changes in the patterns of their spatial mobility.

##### **4.4.6.1. Patterns of Spatial Mobility Before Driving**

Patterns of spatial mobility before gaining the driving license indicated that Most visited destinations that are located around the house area, same neighborhood, or a nearby neighborhood. *Necessity* is the main motivation and drive for spatial movement (Only going out when you need to). Trips are repetitive and have the same destinations, they are usually taken at the same time (on the weekend - Every morning – Every Evening) Trip's purpose revolves around the following:

- Family Visits on the weekends
- Trips to/from work in the morning and the evening
- Trips to entertainment areas (mainly on weekends)

The interview showed that most trips are accompanied by a male relative such as the husband, father, or brother. Women have little knowledge of the different locations of the city and their interaction is very limited with the urban spaces. Trips and destinations are pre-determined and sudden changes in routes or destinations are less likely to happen. Two things dictates woman's ability to use public transportation such as Uber: financial ability + male relative approval. Also Most trips are taken during daytime, trips taken during nighttime are avoided due to security or family rules reasons. Also the Budget of spatial mobility is much higher for women who depend mainly on public transportation or Uber. Lastly is that trips outside the city are extremely limited and only conducted by men.

##### **4.4.6.2. Patterns of Spatial Mobility After Driving**

Patterns of spatial mobility after gaining the driving license indicates that Visited destinations are located in different areas in the city, and not relevant to the house's location. Trips can be taken for necessary or non-necessary purpose, for example, a



random trip with the car around the city, with no specific purpose but to have fun or to entertain oneself. Trips are a also combination of repetitive trips and destinations and new trips and destinations. Women are still conservative when it comes to trying new routes. The interviews also showed that Trip's purpose revolves around the following:

- Family Visits
- Trips to/from work in the morning and the evening
- Trips to entertainment areas such as gym, cafes, restaurants,
- Trips to various areas in the city depends on types of work (Architect = Site visits, Home Business owner = several locations, etc)

Spatial movement is not restricted with a male relative. When needed, sense of security is sometimes achieved with the presence of a relative. After being able to drive, women have a good understanding of the city, and they are familiar with most the urban and public spaces in the city. Trips and destinations are pre-determined and sudden changes in routes or destinations are less likely to happen. Trips are a combination of spontaneous and pre-determined destinations, and sudden changes in routes or destinations can normally happen. Trips are taken during daytime and nighttime, but trips taken in late nights are avoided. Woman can have trips outside the city and take trips between cities.

#### **4.4.6.3. Obstacles and Barriers Before Driving**

- **Affordability:** There is no public transportation options in Jeddah other than Uber and Taxies. Taxis are usually avoided due to lack of safety, supervision, hygiene, and professionalism. The only other available option is Uber of transfer by a male relative.
- **Being bound to others:** Using an Uber, Taxi, or a male relative restricts the extent of spatial accessibility. It restricts women from moving between different destinations freely; because it would add extra cost on them; or because the driver would refuse to have these stops.
- **Time of Loss:** Depending on an Uber, Taxi, or a male relative for one trip or more per day results waste of time due to waiting, ordering, and organizing a trip. The average loss of time was between 20 – 40 Minutes each day. All the women in the interview complained about the waste of time due to being picked up too early or too late.

- Limited knowledge of the city: Most of the women had very limited knowledge and realization for the spatial locations in Jeddah. They are mostly familiar with their own neighborhoods, as well as their main daily destinations such as university or workplace location. Their trips were repetitive and familiar.
- Mental pressure: Women who used to use public transportation were under extra mental stress and pressure. They felt the need to stay alert to the routes taken as well as to pay attention to the driver while commuting. This alertness is a result of women's mistrust of the driver, and their tendency to keep themselves safe and protected.
- Pre-defined destinations: All trips used to be very defined and with a certain purpose and destinations. There was little or no room for change in plans as trip had to be planned and calculated in terms of cost, routes and destinations.
- Lack of Privacy: Sharing the ride with other people such as the multiple drivers and other riders in case of carpooling results in discomfort and lack of privacy. Women tend to talk and behave less while in the presence of other people who are closely sitting with them in the same car.

#### **4.4.6.4. Obstacles and Barriers After Driving**

The nature of obstacles after driving the car are relating to the following:

- Parking lots: Women find parking lots, underground parking lots, or roof parking lots as disliked areas. Mostly because these areas are usually empty, vast, and lacks surveillance, which create a sense of lack of safety and feelings of threat. They prefer areas that are open and has passive or active surveillance.
- Industrial Areas: Women tend to avoid going to or through an industrial area, because it is male-dominant areas. They would rather spend more time going around an industrial area than to go through it and save that time. The avoidance stems from the discomfort of being in a male-dominated area that lacks surveillance and female presence.
- Far locations: Women tend to avoid destinations that are located in the peripheries or outside of the city. They also tend to avoid slums, unorganized neighborhoods, poorly-lit locations, male dominated locations, narrow streets, unfamiliar routes.

- Traffic lights: Traffic lights are considered a point of visibility for women, and several women expressed being harassed while stopping and waiting at the traffic light by other drivers.

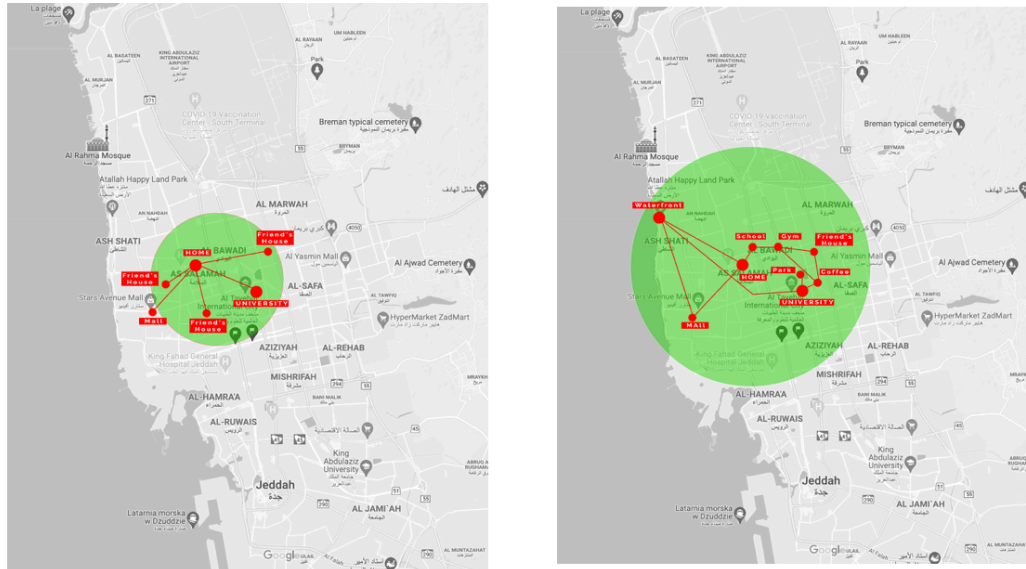


Figure 4.13. The pattern of Raghad’s Spatial Mobility (Before driving -left/after driving-right)

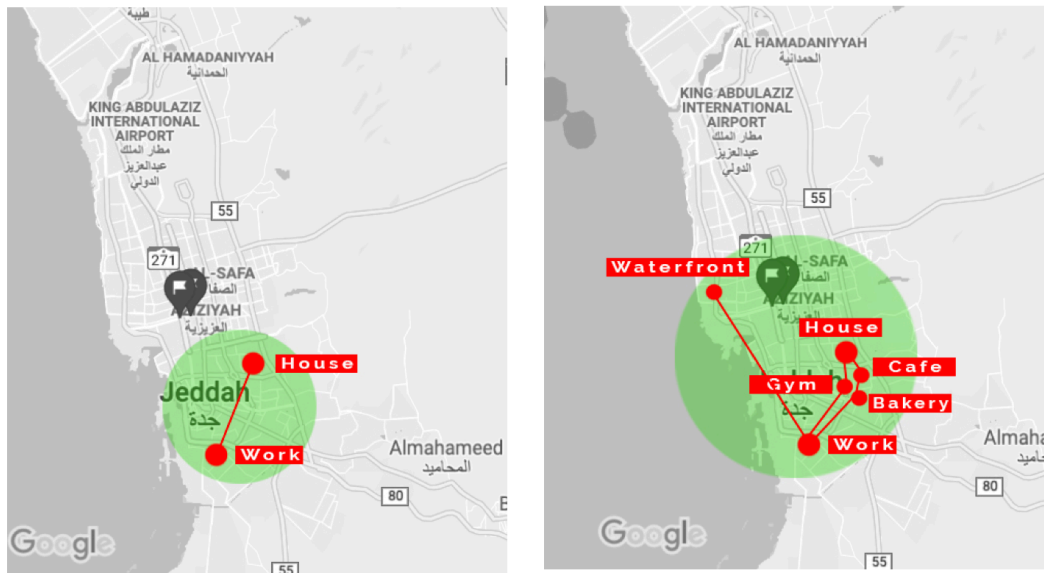


Figure 4.14. The pattern of Malake’s Spatial Mobility (Before driving -left/after driving-right)

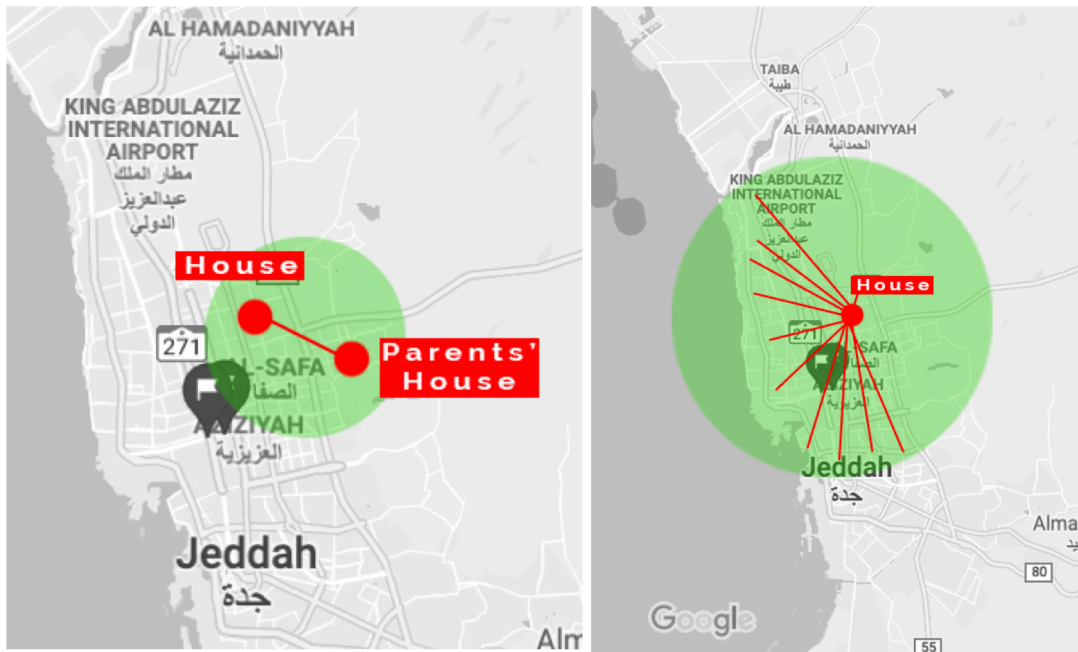


Figure 4.15. The Pattern of Amal’s Spatial Mobility (Before Driving -Left/After Driving-Right)

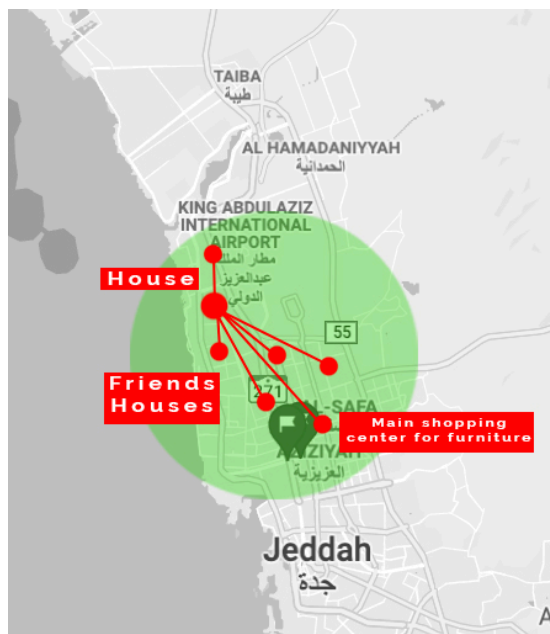


Figure 4.16. The Pattern of Raida’s Spatial Mobility (Before Driving -Left/After Driving)

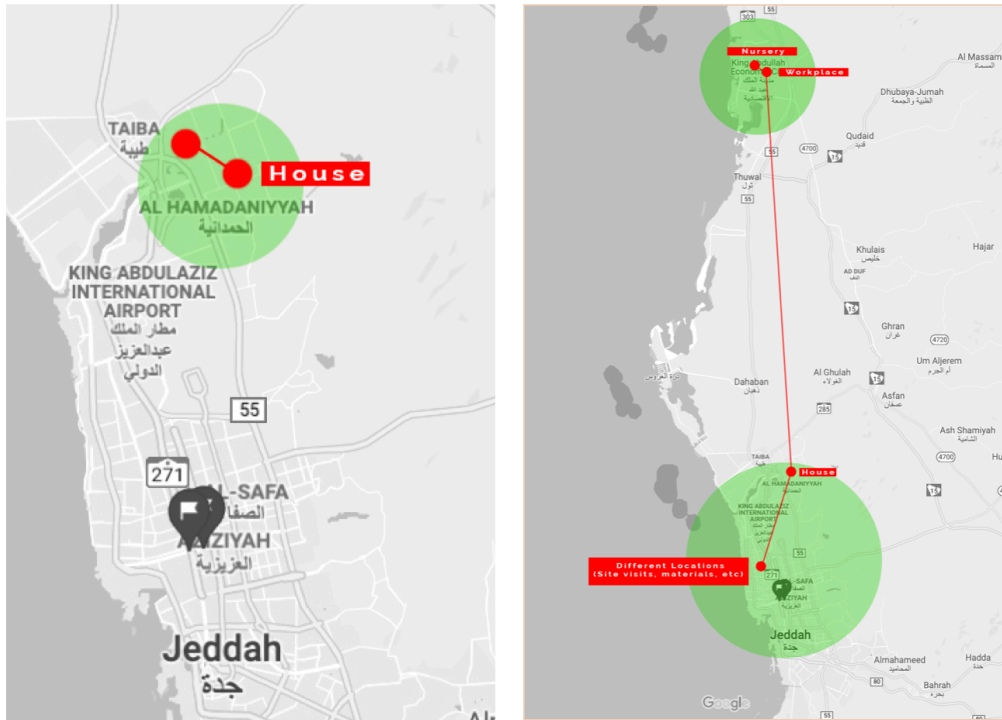


Figure 4.17. The Pattern of Maryam’s Spatial Mobility (Before Driving -Left/After Driving-Right)

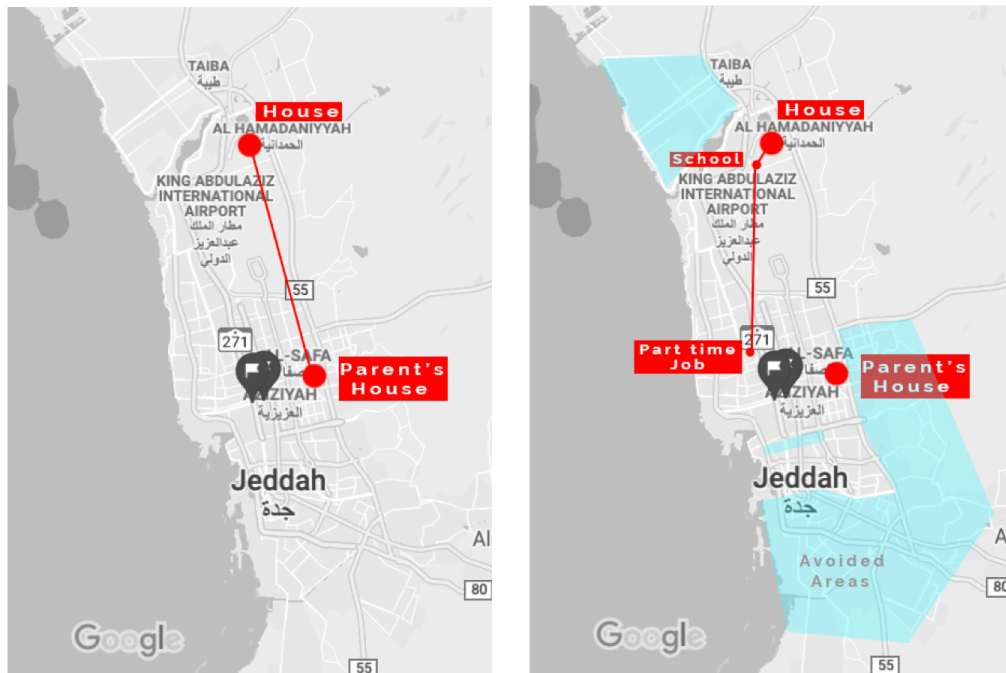


Figure 4.18. The Pattern of Rahaf’s Spatial Mobility (Before Driving -Left/After Driving-Right)

## CHAPTER 5

### CONCLUSIONS

The topic of women's spatial mobility and accessibility in Saudi is very new. Therefore, the contribution of this thesis to the urban planning literature is to provide a general overview of the spatial mobility and accessibility of women (drivers and travelers) in the context of Jeddah city in terms of obstacles, barriers, patterns and characteristics. It also provides base information to urban planners to address the issues that women face while driving/traveling. It also creates a starting point for further studies related to urban equality, urban planning, and public transportation design.

This thesis discusses spatial mobility and accessibility from the point view of gender, specially women's. The first part of the paper discusses literature review that covers the topics of accessibility, mobility, gender, gender Roles, characteristics of women's spatial mobility, perceived safety and sexual harassment in urban spaces, importance of spatial mobility for women, factors impacting women's spatial mobility (individual related factors, social related factors, land uses), and gender biases in transportation and Urban Planning in professional practices and academic research.

There is a difference between accessibility and mobility; accessibility improves people tendency to access more opportunities, while mobility describes the action of people moving from one point to another. Several factors impact the demand on accessibility such as having dependent children, having a full time job, or attending school or university. Several factors can affect accessibility such as Mobility, Geographic Proximity, Transport system connectivity, Affordability, Convenience, Social acceptability. On the other hand, spatial Mobility can be used to describe trips, travels, commuting, migration in terms of individual motivation, physical span, and temporal duration (Recchi et al., 2019). Mobility can be positively associated with freedom of movement and the pursue of purposes (Shaw & Viswanath, 2013).

Gender is a crucial starting point in understanding spatial mobility and accessibility and the extent of both. The definition of gender has multi-dimensional interpretations that differs from place to place and from context to context. Gender roles is very important to understand and realize the nature of women's spatial mobility and experiences in the city (Abdelfattah, 2019). Perceived differences between genders manifests itself in different social tasks. Women were responsible for unpaid domestic work such as child care, cooking, cleaning, attending the husband and family members; which associated her to the indoor-home-family sphere. Accordingly, certain traits got associated such as calmness, modesty, femininity, softness, being protected, calm, sexual modesty, emotional intimacy, and passivity. On the other hand, men were responsible for bread-brining, protecting, hunting, constructing, defending, and fighting to outdoor-wildness-bread-brining; therefore, they were associated with the outdoor sphere. Certain traits got associated with men such as masculinity, aggressiveness, physical strength, emotional restraint, assertiveness, boldness. It is also critical to point out that perceived distinctions between genders have always favored the male over the female, and have created a relation of domination and control practiced over women (Di M eo, G., 2012). Therefore, the city in its current design reflects a certain social power between the two genders; the oppressor and the oppressed, the controller and the controlled, the free and the constrained. that the most explicit representation of gendering of space is the division between public and private space. Public space—the space of transcendence, production, politics, and power—is the sphere of men, whereas private productive space—the sphere of reproduction—is the women's space. The differences in gendered roles impacts the pattern of spatial mobility for men and women. Women's traditional role as a caregivers and men's traditional role as breadwinners shaped the pattern of their spatial mobility and the way they experience the city. Mobility can be found to be associated with masculinity whereas immobility can be associated with femininity.

The second part discuss the characteristics of women's spatial mobility and accessibility in the city. Women's purpose of travel revolves family-oriented purposes, while men's trip tends to be work oriented. Trip's purpose tends to be associated with age, for example women who are older and married tend to have trips that revolves around children, while women who are younger and generally single tend to have trips that revolves around entertainment. Women also tend to have shorter travels than men. women's travelling distances between work and home are 40% shorter than men's; as women tend to keep the distance short between work and home. Women also tend to have

more frequent trips and multiple stops (multi-chaining) than men. Women also tend to prefer familiar destinations and routes. The spatial routes that they prefer to take are usually defined and repetitive, whereas men distribute their trips to many locations.

Safety is the basic starting point of literature on gender and mobility. Sexual harassment is defined as any violence conducted against women. It includes actions that cause mental, sexual, or physical, mental harm or suffering, threats of such acts, coercion and other deprivations of liberty. Feelings of insecurity and fears of moving around the city are more likely to be a serious concern to women than men. Fear of violence impact on the limitation of women's spatial movement plays a critical role in influencing women's perception, impacting her urban prosperity, her life prospects, and her right to everyday life, particularly among the poorest and marginalized. Women usually use several techniques to protect themselves in the urban space. Some women chose modest dressing, some try to hide conceal their presence, some self-imposes restrictions and limitation regarding times and locations.

The degree of quality of women's lives is directly determined by the extent of her mobility. Women's limited mobility jeopardize her chances to benefit from urban prosperity, therefore women and men don't equally benefit from urban prosperity. Women's limited mobility jeopardize her chances to benefit from urban prosperity, therefore women and men don't equally benefit from urban prosperity. The new experience of spatial freedom has provided women with higher sense of self-esteem and a stronger personality and made them more aware of their identities and their potentials. Women who have higher spatial mobility and accessibility are generally more capable to reach further and better job opportunities. As a result, they tend to be more powerful, independent, stronger, and in control over their lives. women who are working and are present in the professional field tend to have more sense of independence. Being part of the active life give them a stronger sense for their selves and their capabilities.

There are three main factors that dictate the extent of women's spatial mobility and accessibility. First factor is individual-related factors such as age, marital status and children, education, cost, income and employment. Women who enjoy more spatial mobility are found to be older in age, married, employed and have higher salaries, have higher education. The second factor is social-related factor such as gender roles and cultural roles. All gendered systems share similar characteristics as they consider women as a "*repository of male honor*"; these systems tend to lower women's spatial accessibility and mobility. Women are more prone to "time poverty" Even though



women's accessibility to paid work is increasing, yet that does not mean that men's participation in domestic responsibilities has also increased. The unequal distribution of domestic unpaid responsibilities is a persistent problem. Time poverty comes when women can barely find time to fulfill their dual paid and unpaid responsibilities.

The third factor is political-related factors such as official laws, regulations, and land uses. Urban and transportation planners often neglect women's needs when it comes to public transportation. The overall practice of transport planning often fails in designing gender-responsive systems. Certain considerations must be taken in the urban planning and land-uses that can increase women's spatial accessibility. Locations must be clustered and centralized; different destinations should be located next to each other. Also roads must consist of a well-connected network, and parking lots must be generously provided. The urban planning and spatial organization is designed in a way that would reinforce reproduction of women's labor and "their supply of solicitude". On the other hand, the majority of academic research in the field of urban studies is gender-biased, and can only be understood from a male perspective, including the needs of urban minorities such as women, children, and people of color.

In conclusion, women's spatial mobility and accessibility is an interdisciplinary subject that is strongly linked to concepts like gender, gender's mobility, urban safety and security.

This study takes the city of Jeddah in Saudi Arabia as a case study to investigate the characteristics and patterns of women's spatial mobility and accessibility. The location of Jeddah was chosen as a case study because of its new emergent case. Until 2018, Saudi Arabia was the only country in the world to ban women from driving a private car. This ban is a result of strict implementation of Sharia Islamic Laws, as well as of the conservative culture of the Saudi society regarding women and their role in the family and society. The ban of women's driving in Saudi was lifted in 2018, and women were allowed to gain their driving license and drive their own cars. Jeddah is a coastal city that is located on the western side of Saudi Arabia.

This study depends on 2 methods to collect primary information and data: face-to-face survey and online conducted interviews. The face to face surveys collected data about the characteristics of the women themselves (drivers or travelers). It created a comparison between women who drive and women who travel in terms of individual-related characteristics and the patterns of their spatial mobility. The surveys were conducted with 100 women: 50 Employed drivers (25 with dependent children and 25

without any dependent children) + 50 Employed travelers (25 with dependent children and 25 without any dependent children). *Drivers* indicate women who have a driver license and drive their own cars. *Travelers* indicate women who don't drive their own cars and use other transportation modes for their spatial mobility. The results of the survey showed big differences between women who drive and women who travel. The conducted survey in this study indicates that women who drive tend to age between 25 – 40, earn higher salaries, and have higher education degrees. On the other hand, women who travel tend to also age between 24 – 40, have lower salaries, job locations that are relative to their houses, and middle education levels. The survey result also shows the difference in the characteristics of spatial mobility for women who travel and women who drive. Women who drive tend to have longer distances for work, spend less time on the way to work, have several purposes for her travel such as leisure and household-related services, have more frequent trips for leisure and entertainment trips, and have more frequent trips for household-related purposes, spend less on monthly cost of transportation, and face less sexual harassment while commuting, and have higher sense of security. On the other hand, the characteristics of spatial mobility for women who travel tend to have shorter distances to work, spend more time on the way to work, have limited purposes for her travel, and have lower frequency of trips that are related to leisure, entertainment, and household trips, spend more on monthly costs of transportation, and face more sexual harassment and feelings of insecurity than women who drive. Even though most house-related trips used to be held by male members before the ban-lift, driving license allowed women to share the responsibility of these trips. The only trips that continued to be carried on by a male-relative is government and official office related trips. Women who drive tend to have higher chained trips, more trips related to entertainment and self-care than women who travel with other modes.

The interviews were conducted with 6 women who gained their driving license and are currently driving their own cars. The interview aims at providing a comparison between their spatial mobility before and after driving in terms of characteristics, patterns, obstacles and barriers. The spatial trips of women who used to travel with other modes of travel were relative to the house, conducted by Necessity, pre-determined and pre-planned, fixed, repetitive in terms of time and destination, repetitive purposes, accompanied by male relative (in case of not using public transportation, taken during daytime, had higher budget, limited mostly to inside the city. Women had limited knowledge and interaction about the city as a whole. The spatial trips of these women

after gaining their driving license and being able to move drive their own cars changed. Trips are not bound to the house's location, trips are not driven by certain necessity or purpose, trips are a combination of repetitive and new destinations, there is room for discovery and change, purpose of trips expands to include entertainment purposes, trips are not restricted to the presence of a male-relative, trips are not restricted to a certain time but late night time is still avoided, trips can expand to other cities as well.

The combination of the results of the survey and the interview helped in creating a general idea and understanding for the spatial accessibility of a number of women in Jeddah City. The data derived from the literature review helped in creating the basis to understand women's spatial accessibility in the city. Hopefully the results found in this paper can contribute to provide better urban policies that can make women's spatial accessibility easier.

## REFERENCES

- Abdelfattah, Lamia. (2019). Deconstructing the trajectories of gendered mobility in Cairo: lessons for urban policy. 10.13140/RG.2.2.27061.32483. Retrieved from [https://www.researchgate.net/publication/333118469\\_Deconstructing\\_the\\_trajectories\\_of\\_gendered\\_mobility\\_in\\_Cairo\\_lessons\\_for\\_urban\\_policy](https://www.researchgate.net/publication/333118469_Deconstructing_the_trajectories_of_gendered_mobility_in_Cairo_lessons_for_urban_policy)
- Abdu, M.S. & Salagoor, J.Y. & Alharigi, Fahad. (2002). Jeddah urban growth and development process: The underlying factors. Scientific Journal of King Faisal University (Basic and Applied Sciences). Retrieved from: [https://www.researchgate.net/publication/288013237\\_Jeddah\\_urban\\_growth\\_and\\_development\\_process\\_The\\_underlying\\_factors/citations](https://www.researchgate.net/publication/288013237_Jeddah_urban_growth_and_development_process_The_underlying_factors/citations)
- Abdelfattah, Lamia. (2019). Deconstructing the trajectories of gendered mobility in Cairo: lessons for urban policy. 10.13140/RG.2.2.27061.32483. Retrieved from [https://www.researchgate.net/publication/333118469\\_Deconstructing\\_the\\_trajectories\\_of\\_gendered\\_mobility\\_in\\_Cairo\\_lessons\\_for\\_urban\\_policy](https://www.researchgate.net/publication/333118469_Deconstructing_the_trajectories_of_gendered_mobility_in_Cairo_lessons_for_urban_policy)
- Abdu, M.S. & Salagoor, J.Y. & Alharigi, Fahad. (2002). Jeddah urban growth and development process: The underlying factors. Scientific Journal of King Faisal University (Basic and Applied Sciences). Retrieved from: [https://www.researchgate.net/publication/288013237\\_Jeddah\\_urban\\_growth\\_and\\_development\\_process\\_The\\_underlying\\_factors/citations](https://www.researchgate.net/publication/288013237_Jeddah_urban_growth_and_development_process_The_underlying_factors/citations)
- Al-bakr, Fawziah & Bruce, Elizabeth & Davidson, Petrina & Schlaffer, Edit & Kropiunigg, Ulrich. (2017). Empowered but not Equal: Challenging the Traditional Gender Roles as Seen by University Students in Saudi Arabia. FIRE: Forum for International Research in Education. Retrieved from: [https://www.researchgate.net/publication/329206427\\_Empowered\\_but\\_not\\_Equal](https://www.researchgate.net/publication/329206427_Empowered_but_not_Equal)

Challenging the Traditional Gender Roles as Seen by University Students in Saudi Arabia

Al-dosari (2017), The Effect of Gender Norms on Women's Health in Saudi Arabia. The Arab gulf States Institute in Washington. Retrieved from [https://agsiw.org/wp-content/uploads/2017/05/Aldosari\\_Womens-Health\\_Online-1.pdf](https://agsiw.org/wp-content/uploads/2017/05/Aldosari_Womens-Health_Online-1.pdf)

Al-joufie, Mohammed. (2016). Exploring the Determinants of Public Transport System Planning in Car-dependent Cities. *Procedia - Social and Behavioral Sciences*. Retrieved from

Al-Rashid, Muhammad Ahmad & Nahiduzzaman, Kh Md & Ahmed, Sohel & Campisi, Tiziana & Akgün, Nurten. (2020). Gender-Responsive Public Transportation in the Dammam Metropolitan Region, Saudi Arabia. *Sustainability*. Retrieved from: [https://www.researchgate.net/publication/345072454\\_Gender-Responsive\\_Public\\_Transportation\\_in\\_the\\_Dammam\\_Metropolitan\\_Region\\_Saudi\\_Arabia](https://www.researchgate.net/publication/345072454_Gender-Responsive_Public_Transportation_in_the_Dammam_Metropolitan_Region_Saudi_Arabia)

Al-shabibi, Nawaf. (2019). A Priminary Determination of Factors Effecting Female Travel Demand, Pattern, and Behavior in the Kingdom of Saudi Arabia. *International Journal of Psychosocial Rehabilitation*. Retrieved from [https://www.researchgate.net/publication/338154558\\_A\\_Primary\\_Determination\\_of\\_Factors\\_Effecting\\_Female\\_Travel\\_Demand\\_Pattern\\_and\\_Behavior\\_in\\_the\\_Kingdom\\_of\\_Saudi\\_Arabia](https://www.researchgate.net/publication/338154558_A_Primary_Determination_of_Factors_Effecting_Female_Travel_Demand_Pattern_and_Behavior_in_the_Kingdom_of_Saudi_Arabia)

[https://www.researchgate.net/publication/291419739\\_Exploring\\_the\\_Determinants\\_of\\_Public\\_Transport\\_System\\_Planning\\_in\\_Car-dependent\\_Cities](https://www.researchgate.net/publication/291419739_Exploring_the_Determinants_of_Public_Transport_System_Planning_in_Car-dependent_Cities)

Beebeejaun, Yasminah. (2016). Gender, urban space, and the right to everyday life. *Journal of Urban Affairs*. 39. 10.1080/07352166.2016.1255526.

Bondi, Liz. (1995). *Feminism and Geography: Feminist Review*. 51. 133-135. 10.1057/fr.1995.43.

- Camagni, Roberto & Gibelli, Maria & Rigamonti, Paolo. (2002). Urban Mobility and Urban Form: The Social and Environmental Costs of Different Patterns of Urban Expansion. *Ecological Economics*. 40. 199-216. 10.1016/S0921-8009(01)00254-3.
- Chant, Sylvia. (2013). Cities through a "gender lens": A golden "urban age" for women in the global South?. *Environment and Urbanization*. 25. 9-29. 10.1177/0956247813477809.
- Cresswell, Tim & Priya Uteng, Tanu. (2008). Gendered Mobilities: Towards an Holistic Understanding. *Gendered Mobilities*. Retrieved from [https://www.researchgate.net/publication/239914493\\_Gendered\\_Mobilities\\_Towards\\_an\\_Holistic\\_Understanding](https://www.researchgate.net/publication/239914493_Gendered_Mobilities_Towards_an_Holistic_Understanding)
- Di Méo, G. (2012). Women and the City: For a Social Geography of Gender. *Annales de géographie*, no 684(2), 107-127. <https://doi.org/10.3917/ag.684.0107>
- F. De Bel-Air, N.M.Shah, P.Fargues and U.Alfarhan. (2017). "Possible Impact of Saudi Women Driving on Female Employment and Reliance on Foreign Workers. Fulf Resrarch Center. Retrieved from [https://www.arabdevelopmentportal.com/sites/default/files/publication/962.glmn\\_en\\_2017\\_04\\_6859.pdf](https://www.arabdevelopmentportal.com/sites/default/files/publication/962.glmn_en_2017_04_6859.pdf)
- Hanson, Susan. (2010). Gender and mobility: New approaches for informing sustainability, *Gender, Place and Culture*. 5-23. 10.1080/09663690903498225.
- Gauvin, Laetitia & Tizzoni, Michele & Piaggese, Simone & Young, Andrew & Adler, Natalia & Verhulst, Stefaan & Ferres, Leo & Cattuto, Ciro. (2019). Gender gaps in urban mobility. Retrieved from [https://www.researchgate.net/publication/333971494\\_Gender\\_gaps\\_in\\_urban\\_mobility](https://www.researchgate.net/publication/333971494_Gender_gaps_in_urban_mobility)
- Gera, Krity & Hasdell, Peter. (2020). The context and experience of mobility among urban marginalized women in New Delhi, India. 10.21606/drs.2020.161.

- Gorne, Cynthia, (2016). The changing Face of Saudi Women. National Geographic. February 2016. Web. 1 February, 2021. Retrieved from <https://www.nationalgeographic.com/magazine/2016/02/saudi-arabia-women/>
- Granbery, A, (2019). Trip Chaining and the Mobility of Care Taking. University of California. Retrieved from:
- Hvidt, Martin. (2018). Lifting the ban on women driving in Saudi Arabia. Reasons and consequences. Center for Middle East Studies. Retrieved from <https://static.sdu.dk/Flexpaper/aspnet/pdf/Hvidt%20article%20Aug%2018.pdf>
- Krane & Majid, (2018). Women Driving in Saudi Arabia: Ban Lifted, what are the Economic and Health Effects? Baker Institute for Public Policy. Retrieved from <https://www.bakerinstitute.org/media/files/files/564007c9/bi-brief-061318-ces-chb-saudiwomendriving.pdf#:~:text=The%20lifting%20of%20the%20ban,safety%20could%20go%20either%20way.>
- Kwan, Mei-Po & Schwanen, Tim. (2016). Geographies of Mobility. *Annals of the American Association of Geographers*. 106. 1-14. 10.1080/24694452.2015.1123067.
- La Rocca, Rosa Anna. (2010). Soft Mobility and Urban Transformation. *Journal of Land Use, Mobility and Environment*. 2. 10.6092/1970-9870/125.
- Legacy, Crystal & Whitzman, Carolyn & Andrew, Caroline & Klodawsky, Fran & Shaw, Margaret & Viswanath, Kalpana. (2013). Building Inclusive Cities: Women's Safety and the Right to the City. Retrieved from [https://www.researchgate.net/publication/263390118\\_Building\\_Inclusive\\_Cities\\_Women's\\_Safety\\_and\\_the\\_Right\\_to\\_the\\_City](https://www.researchgate.net/publication/263390118_Building_Inclusive_Cities_Women's_Safety_and_the_Right_to_the_City)
- Little, Jo & Peake, Linda & Richardson, Pat. (1988). Women in Cities: Gender and the urban environment. 10.1007/978-1-349-19576-3.
- Mandeli, Khalid. (2019). Public space and the challenge of urban transformation in cities of emerging economies: Jeddah case study. *Cities*. Retrieved from

[https://www.researchgate.net/publication/337659071\\_Public\\_space\\_and\\_the\\_challenge\\_of\\_urban\\_transformation\\_in\\_cities\\_of\\_emerging\\_economies\\_Jeddah\\_case\\_study](https://www.researchgate.net/publication/337659071_Public_space_and_the_challenge_of_urban_transformation_in_cities_of_emerging_economies_Jeddah_case_study)

Metro Jeddah Company. (2017). Jeddah Public Transportation Program (JPTP), Metro Lines Project. Retrieved from <http://www.metrojeddah.com.sa/page/JPTP>

Nakhal, Jana. (2015). Women as Space/Women in Space: Relocating our Bodies and Rewriting Gender in Space. *Kohl: A Journal for Body and Gender Research*. 1. 15-22. 10.36583/1-1-3.

Naseem, Sana. (2018). Issues and challenges of Saudi female labor force participation and the role of vision 2030. Retrieved from [https://www.researchgate.net/publication/322436748\\_Issues\\_and\\_challenges\\_of\\_saudi\\_female\\_labor\\_force\\_participation\\_and\\_the\\_role\\_of\\_vision\\_2030](https://www.researchgate.net/publication/322436748_Issues_and_challenges_of_saudi_female_labor_force_participation_and_the_role_of_vision_2030)

Nosal Hoy, K., & Puławska-Obiedowska, S. (2021). The Travel Behaviour of Polish Women and Adaptation of Transport Systems to Their Needs. *Sustainability*, 13(5), 2693. doi:10.3390/su13052693

Peake, Linda. (2009). *Urban Geography: Gender in the City*.

Pozarny, P. (2016). Gender roles and opportunities for women in urban environments (GSDRC Helpdesk Research Report 1337). Birmingham, UK: GSDRC, University of Birmingham.

Qiu, Waishan. (2017). Increasing Saudi females' accessibility to employment via carpooling in Riyadh : measure the realistic commute cost by network computing methods and investigate the share-ability based on actual taxi trip data. Retrieved from: [https://www.researchgate.net/publication/319792706\\_Increasing\\_Saudi\\_females'\\_accessibility\\_to\\_employment\\_via\\_carpooling\\_in\\_Riyadh\\_measure\\_the\\_realistic\\_commute\\_cost\\_by\\_network\\_computing\\_methods\\_and\\_investigate\\_the\\_share-ability\\_based\\_on\\_actual\\_taxi\\_t](https://www.researchgate.net/publication/319792706_Increasing_Saudi_females'_accessibility_to_employment_via_carpooling_in_Riyadh_measure_the_realistic_commute_cost_by_network_computing_methods_and_investigate_the_share-ability_based_on_actual_taxi_t)



- Recchi, Ettore & Flipo, Aurore. (2019). Spatial Mobility in Social Theory. Retrieved from <https://hal.archives-ouvertes.fr/hal-02443307/document>
- Shehayeb, Dina. (2008). Safety and Security in Public Space. Retrieved from [https://www.researchgate.net/publication/307484831\\_Safety\\_and\\_Security\\_in\\_Public\\_Space](https://www.researchgate.net/publication/307484831_Safety_and_Security_in_Public_Space)
- Siwach, P. (2020). Mapping Gendered Spaces and Women's Mobility: A Case Study of Mitathal Village, Haryana, 20(1) 33–48. DOI: 10.1177/0972558X20913680
- Song, Y., Shao, G., Song, X., Liu, Y., Pan, L., & Ye, H. (2017). The relationships between urban form and urban commuting: An empirical study in China. *Sustainability*, 9(7), 1150. <https://doi.org/10.3390/su9071150>
- Susilo, Y.O., Liu, C. & Börjesson, M. (2019). The changes of activity-travel participation across gender, life-cycle, and generations in Sweden over 30 years. *Transportation* 46, 793–818 . <https://doi.org/10.1007/s11116-018-9868-5>
- The Harmonised European Time Use Survey statistics, (2019). How do women and men use their time – statistics. Derived from [https://ec.europa.eu/eurostat/statistics-explained/index.php?title=How\\_do\\_women\\_and\\_men\\_use\\_their\\_time\\_-\\_statistics](https://ec.europa.eu/eurostat/statistics-explained/index.php?title=How_do_women_and_men_use_their_time_-_statistics)
- Transformative Urban Mobility Initiative, (2021, March 11). Remarkable Women Sonya Byers. [Video]. Youtube. <https://www.youtube.com/watch?v=2noehFTcU5E&list=PLIVRqurwrTfGKQH93bSngIfFRHIZmy8vf&index=12>
- Tsay, Shin., Herrmann, Victoria,. (2013). Rethinking Urban Mobility. Carnegie Endowment for International Peace. Retrieved from [https://carnegieendowment.org/files/urban\\_mobility.pdf](https://carnegieendowment.org/files/urban_mobility.pdf)
- Wilkinson, R., & Bevir, M. (Ed.) (2020). Global Gender Gap Report. The World Economic Forum. In *The Encyclopedia of Governance* Sage Publications Ltd. Retrieved from: <https://www.weforum.org/reports/gender-gap-2020-report-100-years-pay-equality>