

Gender Influences and Barriers to Transportation

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Introduction

Women are a heterogeneous demographic group with diverse needs and travel patterns (Clifton & Dill 2005). However, research shows there are particular trends and issues facing the population when it comes to transportation infrastructure and travel mode choice. It is accurate to say that the difference in household dynamics, social roles and lifestyle affect the travel behavior of both men and women. Despite the gender equality accomplishments of society today, changes in societal expectation are slow to develop and specific transportation needs are generally found to be different for men and women. The slight differences in women's lifestyle choices and perceptions of safety create unique travel barriers that need to be identified when creating effective and egalitarian transportation policy.

Research shows that travel patterns are associated with gender. For example, household and childcare responsibilities typically fall to women of multi-person households, resulting in the increased likelihood that women will chain related errands onto their commute, referred to as "trip chaining" (McGuckin & Nakamota 2005). Behavior studies have found that women trip-chain more often than men, women are more likely to work part-time, the presence of children affect women's travel characteristics more than men's, women are more likely to be responsible for child care and household chores, and women require more flexibility in their travel mode choice than men. These factors could lead to more women using private automobiles that provide the flexibility they need along with enhancing their sense of safety (Clifton & Dill 2005). Especially for women with children, research has found that private automobile travel is perceived as a necessity to help women that work full time manage their home and work life (Noble 2005). A 2001 USA National Household Travel Survey found that women are 77% more likely to make trips with children than their husbands. Women with children are found to make more linked trips, more trips solely to meet their children's travel needs and more short trips overall (McDonald 2005). Finally, research shows that women put a larger importance on safety and security than men do when choosing their transportation mode. These contrasting travel characteristics reveal the importance of creating policies and plans that are inclusive to all social demographics and promote gender equality.

Research Methods

Gender is identified by research as an important predictor of travel even when considering travel modes independently (Krizek et al 2005). This summary of the literature will focus women and the gender-influenced travel characteristics they possess in terms of transportation facility usage preference. Secondary research through the review of journal articles is used to determine the realities of women's issues in transportation and the specific opportunities policy makers can leverage. The distinct transport barriers to women are discussed, such as the population's unique needs and the high importance women place on safety when choosing their mode of transportation. Finally, best practices in policy making, such as improving safety through environmental design and prioritizing gender equality in future transportation policy, is explored.

Women's Preferences and Issues in Transportation

Research shows there are gender differences in the transportation modes choice trends, for a variety of reasons. A study using the British National Travel Survey in Great Britain has found that between 1990 and 2002, there has been a 30% increase in the number of trips that women made as car drivers. However, the same study found that women take shorter and more local trips than men and on average make fewer driving trips than trips on foot, bus, or as car passengers than men (see figure 1 and figure 2, Noble 2005).

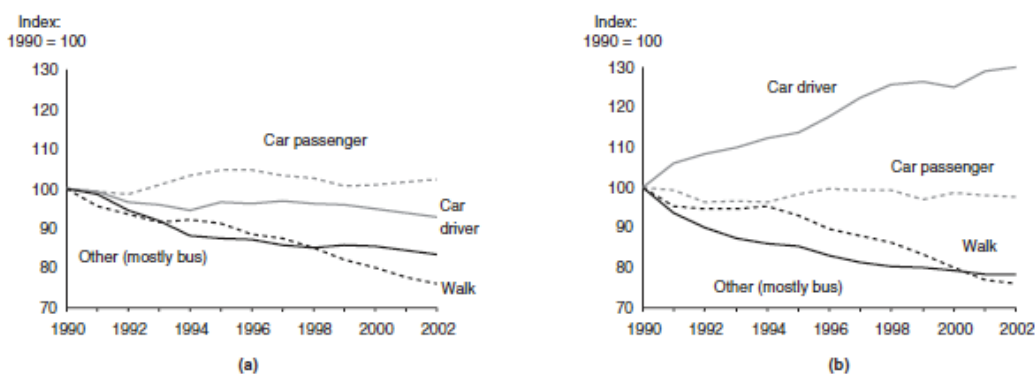


Figure 1: Trends in Trips, 1990 - 2002 (a) males; (b) females (Noble 2005)

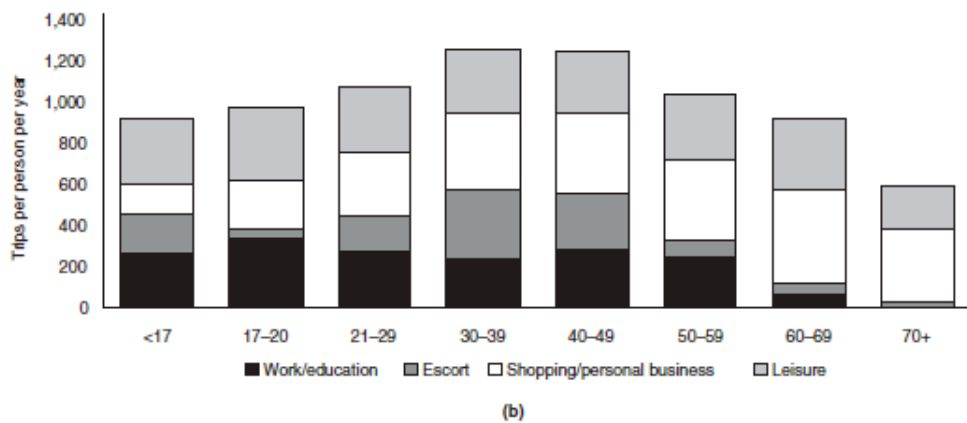
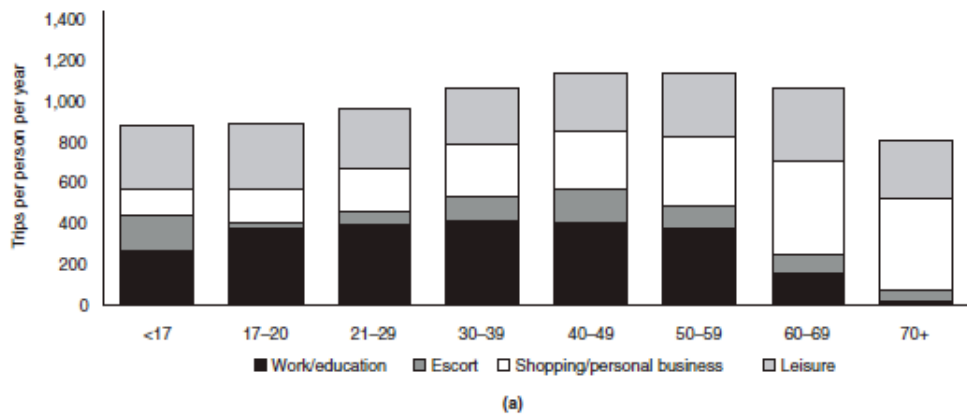


Figure 2: Trips by purpose and age 2002-2003: (a) males; (b) females (Noble 2005)

Another survey conducted in 2002 observed gender differences in travel patterns in Germany. The survey found that women make more trips than men, but they tend to be shorter; women have the shortest average trip length when living in a household with children; women are more often passengers of a car than men, women without children use public transit more often than men; and, fully employed women in multi-person households with children are more likely than men to transport their children to places. The survey showed that the private automobile acted as a prerequisite for women to be able to work full time and still fulfill their family duties. The observed gender distribution of car use is seen in Figure 3 below (Nobis & Lenz 2005). Automobile type choice research shows that female consumers prefer practicality over performance features, better safety features and more storage space due to household responsibilities (Mohammadian 2005).

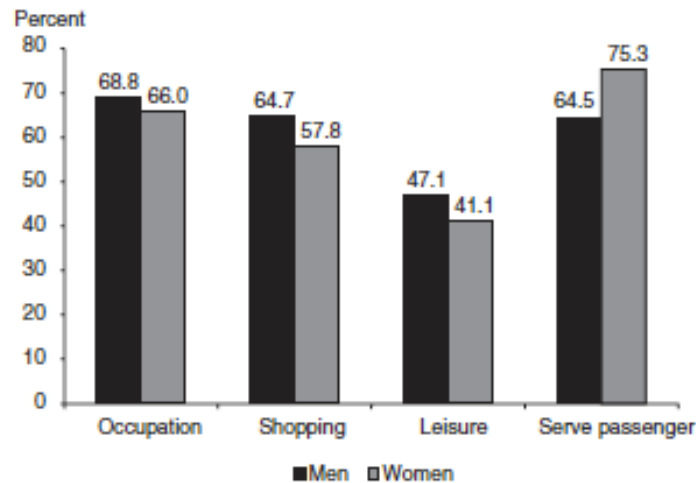


Figure 3: Multi-person households with children: use of car as driver for different trip purposes (Nobis & Lenz 2005)

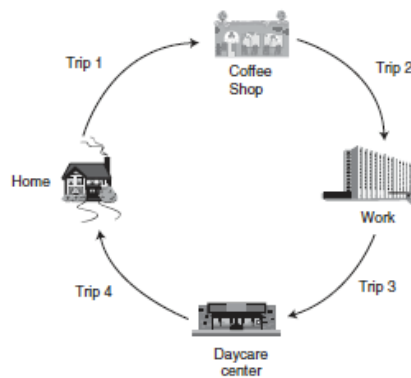


Figure 4: Trip Chaining (McGuckn & Nakamota 2005)

Different studies on gender choice in transportation observed a preference in women for trip chaining. Trip chaining is defined as a sequence of trips linked together between two anchor destinations, usually home and work, as shown in figure 4. There has been an observed increase in trip chaining for both genders during the weekday commute since 1995. Overall, working-age women make more trips than men but travel less distance and time and make short stops, or trip chain, for various reasons. For example, a difference in household responsibilities results in women choosing to trip chain to perform activities such as shopping and family errands, and are found to be twice as likely as men to pick up and drop off children. The results show that women’s travel pattern characteristics are less flexible with regards to departure time and mode choice. The same study has found that women continue to hold jobs closer to home than men, to minimize their work related travel time and to maximize time for non-work related trips to focus on family commitments. Research

shows that the presence of children continues to affect women's travel patterns more than men's. However, it is argued that changes that are happening in household dynamics and gender roles in the workplace continue to change the travel behavior of men and women (McGuckn & Nakamota 2005).

Women are 72% less likely to use non-motorized transport, such as cycling or walking, than men (Rodriguez & Joo 2004). Land use characteristics can influence travel patterns and tend to affect men and women differently. A study on women's travel behavior related to land use found that women living in New Urbanist neighborhoods may walk more than women living in less walkable environments, however, men's behavior is more likely to be a direct response to their built environment. The results of the study show that women's ability and desire to walk is often rooted in other reasons than land use, such as family responsibilities, and is also heavily influenced by safety concerns. The study also found that women walk less than men primarily due to greater household responsibilities and time constraints, and need to trip chain. Mixed-use developments benefit women's travel patterns because they provide multiple destinations in one place. Women desire flexibility in travel, such as quick travel times and storage features, which generally can be found in private vehicles (Clifton & Dill 2005). In addition, women are more concerned with safety with regards to traffic and crime in the pedestrian environment (Clifton & Levi 2005).

There are observable gender differences in bicycle use and how bicycle facilities are perceived. Gender affects how strong factors effecting cycling are weighed when making a travel mode choice. Cycling is effected by factors such as safety along a route, the need to carry goods, limitations posed by schedule and apparel, the weather, the perceived risk and the need to trip chain. The distinct differences between men and women's trip choices can be observed in the purpose of the bicycle trips, the desired amenities such as valuing separated cycling facilities, and the perception of safety. Cycling is known for being one of the riskiest transportation modes and Krizek et al. documents that women are more risk adverse than men. It is found that in general, women cycle less than men and women demonstrate a stronger preference for safe cycling infrastructure such as lighted paths and separated bike lanes (Krizek et al 2005). In addition, women cite the difficulty for trip chaining, long distances, and carrying goods and children as the top barriers to

cycling. It is therefore that women are less likely to be full-time cyclist commuters than men (Heinen 2011).

The outcome from the studies above is that travel behavior is largely influenced by gender attitudinal preferences. Surveys on women travel preference from San Diego, San Mateo County and Utah find that women are more likely to feel less safe than men in certain areas, in parking garages late at night and using public transportation. The surveys showed that women have a fixed and constrained schedule and prefer to use the most convenient form of transportation regardless of its cost. They are also more sensitive to stress and would prefer to avoid travelling at stressful times (Yushuang et al 2005). To summarize, other than the need for availability of flexible travel options due to household and work responsibilities, the largest transportation concern stated by women is the importance of feeling safe, regardless of the travel mode.

Safety Issues in Transportation

A scan of the literatures shows that safety is a huge concern to women using all modes of transportation; including walking, cycling, taking public transit and driving. Women value security and safety to a higher degree than men when choosing their travel preference. Both objective and subjective safety plays a critical role in women's travel behavior. The design of infrastructure and transportation policy can hugely influence women's perception of safety; therefore it is important to understand their specific wants and needs.

A good pedestrian environment can have a significant positive impact on a women's decision to walk when they are concerned about safety. When choosing to walk, the two aspects of safety that are important to women are not being hit by a vehicle and not being the victim of a crime. Infrastructure such as sidewalks, curb extensions and crosswalks can reduce the chances of being hit by a vehicle and improve the objective safety of female pedestrians (Clifton & Dill 2005). Women exhibit fewer risk-taking behaviors than men, such as violating traffic laws, and are therefore statistically less likely to be injured or killed in a pedestrian-vehicle crash than men (Clifton et al 2005). However, perceived safety is the determining factor in walking rates among women. Urban design features such as lighting can improve both objective and subjective safety. Well-designed and walkable New Urbanist

neighborhoods can help encourage walking for women by creating safer environments (Clifton & Dill 2005).

One study, using a US Bureau of Justice survey from 2000, found that 52% of women are afraid of walking around their neighborhood at night, while only 23% of men are. Women's perception of risk in public spaces does not represent actual risk but are complex products of individual experience and relation to space, and women are influenced by their specific environmental conditions and settings. The fear is not rational or based in fact, and includes underreported crimes such as intimidation and harassment. Women will choose the travel routes and visit the public places they perceive as safe. Higher levels of perceived neighborhood safety is related to more walking and higher physical activity levels in women. Crime, safety and the built environment are interrelated and can be prevented through environmental design such as "eyes on the street", ground floor activities and adequate lighting (Loukaitou-Sideris 2005).

Research conducted in the Netherlands has found that generally, men cycle more than women. This fact is especially true in countries with lower than average cycling rates. In countries with high proportion of cycling commuters, gender rates of cycling are more evenly proportioned and bicycle commuting is popular with women. This is because countries with high mode share of cycling have more safety infrastructure present. Women consider bicycle facilities, such as bike lanes and paths, more important than men when it comes to feeling comfortable and safe cycling. Women also are less likely to cycle at night because of personal security reasons. Both objective and subjective safety is considered to play a critical role in the reason women choose not to cycle. However, both men and women consider cycling to be less safe than walking, using a car, or taking public transit (Heinen 2011). Cycling is perceived as risky but has many benefits and encouraging this travel mode to all subsets of the population through the construction of safer infrastructure and motivating policies is important to get minority groups such as women to use a bicycle for travel.

To increase the use of public transit, operators must tailor crime reduction programs to the needs of women, with respect to actual crime and fear of crime. Women tend to express more fear of crime than men, and research found that an extra 10.5% of transit journeys could be generated if the public felt more secure on public transit (Carter 2005). Simple solutions are well-placed lighting, technology

surveillance cameras and enhancing security staffing to provide a safe perceived environment for current and potential women transit users (Bomar 2005). A national survey in Canada showed that most women respondents felt scared of walking alone to a car in a parking garage or using public transit at night. Bus and train stops that are poorly designed and feel unsafe also deters potential women transit users, especially at night. In such cases, women will choose to drive a private automobile or take a taxi (Loukaitou-Sideris 2005). Research in Finland shows that women drivers are more likely to follow traffic regulations and manage well driving with regards to safety (Laapotti 2005). The literature generally concludes that safety is such an important concern to women that it can influence their travel behavior by eliminating the transportation choices that are perceived as unsafe. This is a huge issue in transportation planning, because it is important to plan for an efficient and gender-equal system where all subsets of the population feel safe to choose a variety of travel modes that are convenient for their lifestyle.

Gender Equality in Transportation Policy Best Practices

Planning and design interventions can improve safety and promote gender equality in transportation systems. It is vital for planners to look at demographic characteristics to understand who is using a particular transportation service and why to comprehend the key attitudes behind travel mode choice. The perception of travel mode choices is a key piece of information that can help identify strategies that are needed to achieve a desired position in the market place. Transit agencies in particular can target specific market segments on the bases of rider preferences for their services. Market research has shown that women are more sensitive to safety, women desire a stress-free ride and women are constrained by a fixed schedule (Yughuang et al 2005). Transit agencies can then use this information when creating their policies and developing their services.

Planning and design interventions can prevent crime and create feelings of safety within the built environment, facilitating walking and physical activity for more vulnerable demographic groups, such as women. The design strategies need to respond to both real and perceived safety issues, because both can restrict women from walking in an area. Crime prevention through environmental design solutions include:

- General maintenance of the physical environment;

- Facilitate “eyes on the street”;
- Place transit facilities near places where they can be overseen by neighbors;
- Replace pedestrian tunnels with safe ground-level crossing;
- Provide good lighting on streets, parks and transit stations;
- Create safe areas for people to gather; and,
- Provide safe access routes to important destinations.

A best practice example to develop effective planning and design interventions is to include women’s groups in the strategic transportation planning process. An example of this exists with the structure of transit services in Toronto and Vancouver (Loukaitou-Sideris 2005). Most importantly, improving the pedestrian environments for actual safety with regards to reducing pedestrian and vehicle collisions will have the same safety advantages for both men and women (Clifton et al 2005).

Swedish transport policy and practice is a prime example of a method to incorporate gender equality in transportation policy. In 2001, gender equality became the sixth goal of transport policy in Sweden, by designing the transportation system so that both women’s and men’s travel needs are satisfied, by giving women and men the same possibilities to influence the system design and by giving women’s and men’s values equal consideration. This approach was referred as “gender mainstreaming,” and came about because of the observed quantifiable differences between men and women in Sweden. Women were underrepresented in policy decision-making and were observed to have diverging travel patterns than men (Polk 2005).



Figure 5: Swedish Transport Logo

An implementation example of transportation policy was a gender analysis that was conducted of the Swedish road infrastructure. The goal was to identify the differences between women’s and men’s experience, preference and opinion about the design of road system infrastructure. Interviews were held with transportation experts, transportation practitioners and road users. The results found that three categories of the road system infrastructure had a gender dimension: security and safety, driving

experience and transport policy goals. Women place road safety as more important than men with regards to unprotected users such as pedestrians and they express a greater need to follow traffic rules. In addition, women were found to have a cooperative opinion towards road system infrastructure, while men were found to view it more individualistically. The belief was that to successfully integrate gender equality into transportation policy, an equal representation of men and women in the decision making and planning sectors will incorporate women's travel needs and opinions into the policies and projects carried out by the transport sector (Polk 2005).

The goal of the Swedish transport policy was to create a transportation system that better satisfies the needs and experiences of a large variety of users. The success of integrating gender equality within the policy is dependent on the practical role of gender within the transport sector (Polk 2005). The creating of the gender equality policy started in 1998 with the Swedish government proposing a new advisory council, the Gender Equality Council for Transport and Information Technology. In response, in 2002 the Swedish Institute for Transport and Communications Analysis proposed the following intermediate recommendations:

- To plan for a more secure transport system;
- To target a more equalized proportion of women in employed in transport agencies;
- To analyze plans and projects from a gender equality perspective to show possible resulting effects on women and men;
- To initiate more research on the typical female and male perspectives of transportation issues;
- To encourage more female researchers to work within the field of transport research; and,
- To carry out information programs to clarify gender equality issues.

The objective was to give men and women the same opportunities to influence the construction, design and management of the transportation system, to give their values equal significance, and to have an even distribution of power and influence between men and women within every mode of transport. Data gathered of men's and women's usage and impact on the transportation system, such as their travel patterns, times, mode choice, costs and safety, was considered important when developing the policy. In Sweden, awareness of gender equality is growing, but there is still a dominance of men in the transport sector (Vagland 2005).

Conclusion

This literature review shows that there is a significant difference in gender preferences in all types of travel modes. The key factors affecting women's travel preferences were found to be safety and flexibility. Women desire to feel safe and require flexible travel options to accommodate diverse needs. For example, constructing a built environment that is perceived as safe can increase walking rates for women, and information about women's preference with regards to safe cycling facilities is useful when developing policies that target an increase in cycling for all users. It is important to research and analyze demographic characteristics of specific subsets of the population to create effective transportation policies. The Swedish transportation policy of "gender mainstreaming", or developing transport policy that is gender-aware, is a powerful method that takes into account the specific travel needs and preferences of women. Finally, to truly have a gender equal transportation system, there needs to be gender-equal representation of men and women in the decision-making and transportation planning sectors.

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