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## **EQUITY IN TRANSPORTATION PLANNING: THE ROLE OF GENDER ANALYSIS**

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### **Abstract**

Transportation systems play a vital role in shaping access to opportunities, social inclusion, and urban sustainability. However, mainstream transportation planning has historically overlooked gender-specific mobility needs, leading to inequitable access, safety concerns, and limited participation for women and gender-diverse individuals. This study explores how gender analysis can be strategically incorporated into transportation policy and design to foster inclusive, responsive, and just mobility systems. Drawing from feminist urban theory, intersectionality, and case studies from cities like Vienna and Bogotá, the paper examines the institutional biases embedded in transport infrastructure, including gender-blind policies, male-centric planning models, and the lack of sex-disaggregated data. It further discusses participatory planning tools, technological innovations, and policy frameworks that can help mainstream gender in transport governance. The study concludes with a set of strategic recommendations aimed at institutional reform, inclusive data collection, and equity-centered urban mobility, highlighting the importance of gender-responsive approaches in achieving transportation justice.

### **Keywords:**

Gender-sensitive planning, Mobility justice; Intersectionality, Transportation equity, inclusive urban design.

### **Introduction**

Transportation plays a pivotal role in shaping individual lives, urban structures, and broader socio-economic dynamics. As a key determinant of access—to employment, education, healthcare, and social networks—it is deeply intertwined with equity and justice in society. Yet, for decades, transportation planning has operated within frameworks that often neglect the lived realities of marginalized populations. Among the most pervasive oversights is the insufficient integration of gender as a fundamental variable in both transportation research and policy design.

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While transportation systems may appear neutral, they are in fact deeply gendered in the way they are experienced, accessed, and navigated (Hanson, 2010).

Gender profoundly influences mobility patterns, transportation needs, and travel behavior. Women, for instance, are more likely to engage in trip chaining—making multiple stops in one journey due to responsibilities like caregiving, errands, or school drop-offs (Crane, 2007; Rosenbloom, 2006). They tend to rely more on walking and public transit compared to men, who are more likely to drive alone or commute longer distances for work (Peters, 2001). Additionally, issues such as personal safety, affordability, and time constraints disproportionately affect women and gender-diverse individuals. These disparities arise not only from social and economic differences but also from institutional planning norms that have historically prioritized the needs of a predominantly male workforce while overlooking more complex, multitasking mobility patterns (Law, 1999; Levy, 2013).

The traditional focus in transportation planning on peak-hour commuter flows and vehicular traffic efficiency has contributed to systems that are less responsive to the diverse needs of all users. This technocratic approach often fails to capture the socio-cultural contexts in which mobility occurs (Lucas, 2012). Gender-blind transportation policies—those that do not consider how policies affect different genders differently—have reinforced structural inequities, perpetuating a one-size-fits-all model that ignores systemic exclusions (Greed, 2011). Moreover, gender intersects with other dimensions of identity—such as age, ability, income, and ethnicity—compounding mobility disadvantages for specific groups and rendering their needs invisible in mainstream planning discourse (Ng & Acker, 2018).

Incorporating gender analysis into transportation planning introduces a paradigm shift—one that moves from an assumption of neutrality to intentional inclusion. It involves not only collecting and analyzing sex-disaggregated data, but also examining how social roles, safety perceptions, economic status, and institutional structures shape transport needs and experiences (Turner & Grieco, 2000). Gender-responsive planning enables more inclusive and effective design choices, such as improved lighting and surveillance in transit areas, better pedestrian infrastructure, accessible transport schedules, and enhanced connectivity in underserved communities (UN-Habitat, 2013). These strategies not only benefit women but also serve all populations with limited mobility, including children, the elderly, and persons with disabilities.

This paper argues that gender analysis is not an optional add-on, but a foundational approach to ensuring equitable transportation systems. By exposing implicit biases and highlighting the differentiated impacts of transport policies, gender analysis empowers planners and policymakers to design systems that are just, efficient, and inclusive. In doing so, it contributes to broader goals of social equity and urban resilience, transforming transportation networks from instruments of exclusion into platforms for empowerment and mobility justice.

### **Theoretical Framework: Gender and Mobility**

Understanding the complex relationship between gender and transportation begins with acknowledging that gender is not a fixed biological attribute but a socially constructed identity shaped by cultural norms, institutional practices, and power relations. In the context of mobility, gender determines not only who moves and how but also whose movement is prioritized and

whose is constrained. Rather than treating men and women as homogenous categories with static travel behavior, scholars emphasize that gender identities are dynamic and deeply influenced by societal expectations and roles (Butler, 1990; Hanson, 2010). For example, women are often assigned disproportionate responsibility for unpaid care work, such as escorting children to school, shopping for household needs, or caring for elderly family members—tasks that heavily influence their mobility choices and patterns (Crane, 2007; Rosenbloom, 2006). These socially assigned roles restrict spatial and temporal mobility, creating what feminist geographers call "time-space poverty" (Turner & Grieco, 2000).

To fully understand these dynamics, an intersectional approach is essential. Coined by Kimberlé Crenshaw (1989), intersectionality recognizes that individuals experience layered forms of oppression based on overlapping identities—such as gender, race, age, ability, and class. In transportation, this means that a low-income woman with a disability may face vastly different barriers than a middle-class, able-bodied woman, even though both are subject to gender-based inequities. Public transportation systems that lack elevators or safe lighting disproportionately affect not only women but particularly women with disabilities or mothers traveling with strollers. Similarly, elderly women—especially those living on fixed incomes—face unique spatial exclusions when transport services prioritize fast, long-distance commuting over local, affordable, and safe connections (Lucas, 2012; Ng & Acker, 2018). Intersectionality thus compels planners and researchers to avoid singular narratives and instead adopt frameworks that account for the diversity of lived experiences across populations.

Feminist urban theory offers critical insights into how cities—and by extension, transportation systems—are organized in ways that reflect and reproduce patriarchal values. Rooted in critiques of the modernist planning paradigm, feminist theorists argue that urban infrastructure has historically been built around the rhythms and needs of male breadwinners, with little regard for the caregiving and community-oriented movements that characterize women's mobility (Greed, 1994; Law, 1999). The design of transportation systems prioritizing radial networks for work-home commutes to central business districts, for instance, often neglects the "trip chaining" that women do throughout peripheral zones for caregiving and domestic activities. Such neglect reinforces spatial injustice and mobility deprivation. Feminist critiques challenge this by calling for a "mobility of care" framework—one that centers the full range of daily travel needs, including unpaid labor and safety, rather than just economically productive movement (Levy, 2013).

Mobility justice, an emerging concept within feminist urban studies, builds on these critiques by linking transportation equity to broader social justice goals. It emphasizes that access to transportation is a matter of rights and recognition, not just infrastructure efficiency (Sheller, 2018). A mobility justice perspective asks whose movement is enabled, whose is policed or constrained, and how power operates through space. This includes considering how women and marginalized groups are surveilled or harassed in public spaces, how budgetary decisions reflect systemic priorities, and how transportation design either reproduces or challenges social exclusion. From this lens, mobility is not merely about getting from point A to point B; it is about being able to access opportunities, participate in society, and exercise autonomy over one's time and space.

Together, the constructs of gender as a social identity, the analytical lens of intersectionality, and the normative vision of feminist urban theory and mobility justice form a powerful theoretical framework for analyzing inequity in transportation systems. They provide the tools to critically interrogate the assumptions embedded in transport planning and to reimagine systems that reflect the needs and rights of all users, especially those historically marginalized. Rather than offering piecemeal fixes, this framework advocates for a structural transformation in how transportation is conceptualized, governed, and built.

### **Institutional Biases in Transportation Planning**

Transportation systems are often presented as technical, neutral infrastructures designed to serve the public equitably. However, this assumption of neutrality has come under increasing scrutiny, especially from gender and equity scholars who argue that such neutrality frequently conceals institutional biases embedded in planning paradigms and policy implementation. A critical distinction must be drawn between gender-neutral and gender-blind approaches in transportation planning. While a gender-neutral approach seeks to treat all individuals equally, it often fails to recognize pre-existing inequalities in access, safety, and opportunity. In contrast, gender-blind policies actively ignore gender-specific needs and constraints, thereby reinforcing systemic disadvantages under the guise of impartiality (Greed, 2011; Levy, 2013). For instance, transportation systems that prioritize peak-hour commutes without considering off-peak safety or child-accompanied travel are effectively blind to the mobility patterns of many women and caregivers.

Much of the current transport infrastructure has been historically shaped by male-centric assumptions about who travels, why, and when. Early urban transport systems were designed to facilitate the movement of male breadwinners between suburban homes and central business districts, reflecting a model of single-purpose, linear commuting (Hanson & Pratt, 1995). This paradigm largely excluded the daily realities of women, who often make shorter, more frequent, and multi-stop trips—activities that do not align with the dominant work-home binary that shaped urban development and transit investment (Law, 1999; Peters, 2001). As a result, resources have long been disproportionately allocated to roads and highways over local pedestrian infrastructure, feeder services, or flexible scheduling, all of which are more aligned with the travel behaviors of non-male users. Even in contemporary planning frameworks, there is often an overemphasis on economic productivity as a justification for investment, sidelining the vital but unpaid mobility associated with care work (Turner & Grieco, 2000; Levy, 2013).

One of the most persistent institutional barriers to equitable planning is the lack of sex-disaggregated and gender-sensitive data. Most transport surveys and models collect information on trip frequency and mode of transport but rarely probe into the purpose of trips, the travel experience, or the socio-economic context surrounding mobility decisions (Ng & Acker, 2018). This results in planning models that aggregate users into undifferentiated categories such as “commuters” or “passengers,” masking critical differences based on gender, age, ability, or caregiving responsibilities. The absence of granular, gender-disaggregated data not only limits the ability to identify disparities but also hampers the development of evidence-based interventions aimed at addressing them (Lucas, 2012). Furthermore, when women’s travel patterns are viewed

as anomalies or exceptions rather than as essential use-cases, their mobility needs continue to be marginalized in transportation forecasting, funding, and design.

These institutional biases are often perpetuated by the composition of the transport planning field itself, which has historically been dominated by male professionals and technocrats. This homogeneity in perspective can lead to blind spots in identifying and prioritizing gendered issues. Without diverse representation in decision-making processes, even well-intentioned policies may fail to address the structural inequities embedded in everyday mobility (Greed, 2011). Moreover, resistance to integrating gender considerations is often justified by appeals to objectivity and efficiency—principles that can paradoxically uphold exclusionary practices when they are not critically examined through a social equity lens.

Addressing these entrenched biases requires a fundamental reorientation of transportation planning to acknowledge and correct for its historical and institutional imbalances. Planners must move beyond tokenistic gestures toward inclusion and instead embed gender analysis at all stages of the policy cycle—from data collection and needs assessment to budgeting, design, and evaluation. Only then can transportation systems evolve from instruments of inequality into platforms for mobility justice and inclusive urban development.

### **Incorporating Gender Analysis in Policy and Design**

Incorporating gender analysis into transportation policy and design represents a pivotal step toward correcting systemic inequities and ensuring that urban mobility systems are inclusive, accessible, and just. Gender analysis moves beyond superficial equality frameworks to critically assess how transportation systems affect individuals differently based on their gender and intersecting identities. At its core, gender-sensitive planning seeks to mainstream gender considerations throughout the planning lifecycle—beginning with needs assessments and data collection and continuing through design, implementation, and evaluation. This approach requires robust analytical tools and institutional commitment to equity as a foundational planning principle (Ng & Acker, 2018).

Several methodologies have been developed to support gender-sensitive planning. These include gender audits, gender impact assessments, and the integration of sex-disaggregated data into transport models. Gender audits assess the degree to which existing policies and systems reflect gender equity principles, often using scorecards and qualitative evaluations (Greed, 2005). Gender impact assessments, on the other hand, forecast how proposed policies may differentially affect various gender groups and recommend adjustments accordingly. More recently, planners have also begun using geospatial tools and time-use surveys to better understand women's and caregivers' mobility patterns, particularly in informal or underserved neighborhoods (Levy, 2013; Turner & Grieco, 2000). These tools are critical for revealing hidden travel needs, such as off-peak travel, trip chaining, and pedestrian movement, that are often excluded from conventional transport models focused on peak-hour commutes and economic productivity.

Central to effective gender-responsive transportation planning is participatory planning and inclusive data collection. Traditional top-down approaches to planning often exclude the voices of those most affected by transit inequities—especially low-income women, persons with disabilities, and gender-diverse individuals. In contrast, participatory planning actively involves

communities in identifying transport needs, assessing risks, and co-designing solutions. Methods such as focus groups, mobility diaries, and participatory mapping have proven effective in capturing nuanced data about travel behavior, perceived safety, affordability, and accessibility (UN-Habitat, 2013; Peters, 2001). Importantly, inclusive data collection must be disaggregated not only by sex, but also by age, income level, household role, and caregiving responsibilities to fully capture the diversity of users' experiences.

Several global cities have successfully implemented gender-responsive transport planning, offering valuable best practices for broader application. Vienna, for example, is widely regarded as a pioneer in gender mainstreaming in urban design. Starting in the 1990s, the city undertook a series of projects to integrate women's mobility patterns into its urban infrastructure. This included redesigning pedestrian paths, improving lighting, and expanding sidewalk space to accommodate strollers and shopping carts. Based on gender-segregated data that showed women made more frequent, shorter, and multi-purpose trips, the city also adjusted public transit routes to serve schools, health centers, and markets more efficiently (Greed, 2005; Levy, 2013).

Another compelling example is Bogotá, Colombia, which incorporated gender considerations into its *TransMilenio* bus rapid transit (BRT) system. Through extensive participatory processes involving women from different socio-economic backgrounds, the city developed measures to address sexual harassment and safety concerns on public transport. These included public awareness campaigns, improved lighting at stations, and the implementation of women-only buses during peak hours (Bustamante, 2015). Bogotá's approach demonstrates how even within constrained budgets, urban transport can be made more inclusive through targeted, context-specific interventions.

These cases underscore that gender-responsive transport planning is not only feasible but also beneficial to the broader population. Infrastructure designed with women and vulnerable users in mind tends to improve safety, efficiency, and usability for everyone. Moreover, by promoting inclusive planning processes and institutionalizing gender analysis, cities can address deeply rooted inequities while enhancing overall system resilience. To achieve this, transportation agencies must be willing to institutionalize gender mainstreaming—not as a peripheral concern, but as a central planning objective backed by adequate resources, training, and political will.

### **Challenges and Opportunities in Implementation**

Despite increasing recognition of the importance of gender-sensitive transportation planning, implementing gender analysis in practice remains fraught with significant challenges. One of the most persistent obstacles is institutional resistance and policy inertia. Many transport agencies operate within rigid bureaucratic systems that favor continuity over reform and are dominated by technocratic planning cultures that prioritize efficiency, cost-benefit analysis, and quantitative outputs over social equity concerns (Greed, 2011; Levy, 2013). Gender is often seen as an external or secondary issue—if considered at all—leading to tokenistic approaches or one-off projects rather than systemic integration. Moreover, the dominance of male professionals in the fields of transport engineering and urban planning perpetuates blind spots regarding gendered needs. Without a shift in institutional culture and professional norms, efforts to embed gender analysis into transportation policy risk being sidelined or diluted (Turner & Grieco, 2000).

Compounding these structural issues is the lack of consistent funding, technical training, and political will. Even when governments acknowledge the importance of gender mainstreaming, translating that recognition into actionable budgets and capacity-building programs is a different matter. Many transportation agencies lack dedicated gender specialists or training programs that equip staff to collect and analyze gender-disaggregated data or engage with diverse communities. In addition, budget cycles are often short-term and performance metrics focus on tangible infrastructure delivery—such as kilometers of road built or transit ridership—rather than on inclusive outcomes like user satisfaction or perceived safety (Lucas, 2012). The absence of gender-focused key performance indicators (KPIs) in policy evaluation frameworks further undermines the institutionalization of equity objectives. Furthermore, in low- and middle-income countries, competing infrastructure demands and fiscal constraints often lead to the deprioritization of socially oriented goals like gender equity, which are perceived as non-essential or politically sensitive (Ng & Acker, 2018; Peters, 2001).

However, the current moment also offers opportunities, particularly through emerging technologies and evolving policy paradigms. Technological innovations—including smart city platforms, mobile mobility apps, AI-based transit optimization, and real-time data collection—have the potential to enhance gender-sensitive planning when applied thoughtfully. For instance, digital platforms can gather disaggregated travel data, map unsafe zones, and crowdsource feedback on transport services, giving voice to users who are often marginalized in formal planning processes (Sheller, 2018). Women-specific safety apps, anonymous reporting tools, and geo-tagged harassment data have begun to inform urban safety strategies in some global cities. Nonetheless, the benefits of such tools are not automatic. In many contexts, technological solutions can also reinforce existing gender disparities, particularly where women face digital exclusion due to lower rates of smartphone ownership, internet access, or digital literacy (UN-Habitat, 2020). In addition, automated systems and algorithmic planning tools—if based on gender-biased datasets—can encode and perpetuate inequities under a veneer of objectivity (Crawford, 2021).

To fully harness these opportunities, it is essential to couple innovation with inclusive governance structures and participatory frameworks. This includes ensuring that marginalized voices are represented in technology design, that privacy and accessibility are safeguarded, and that digital interventions are backed by offline support systems. Gender-equitable implementation also depends on strong political leadership and intersectoral collaboration, linking transport ministries with gender, health, and urban development sectors. In this regard, international development institutions, such as the World Bank and UN-Habitat, play an important role by providing guidance, funding, and global platforms for knowledge exchange.

Ultimately, while the path toward gender-equitable transportation systems is hindered by institutional and structural challenges, it is also increasingly supported by a confluence of technological advances, growing awareness, and a global shift toward inclusive urbanism. The successful implementation of gender-sensitive planning will depend on the willingness of governments and institutions to prioritize social equity, rethink conventional performance metrics, and embrace participatory, interdisciplinary planning models that recognize mobility as both a right and a resource.

## Conclusion

Transportation is not merely a technical system for moving people; it is a powerful mechanism that can either reinforce or challenge patterns of social inequality. This paper has demonstrated that transportation systems are deeply gendered, shaped by institutional biases, historical planning models, and systemic exclusion of marginalized voices. A critical review of the literature reveals that traditional transportation planning has long been dominated by male-centric, efficiency-driven models that fail to account for the diverse mobility needs of women and gender-diverse individuals (Hanson, 2010; Law, 1999). These oversights are compounded by policy inertia, data deficits, and a lack of institutional frameworks for mainstreaming gender equity into transport design (Lucas, 2012; Ng & Acker, 2018).

One of the key findings of this paper is the inadequacy of gender-blind planning approaches, which often disguise inequity under a façade of neutrality. Gender-sensitive and intersectional frameworks reveal that mobility is shaped not only by gender but also by intersecting factors such as age, disability, caregiving roles, and income. This complex interplay demands planning tools that go beyond simplistic categories and engage with lived experiences. Furthermore, the paper highlighted how participatory planning, inclusive data practices, and technology—if thoughtfully applied—can serve as effective mechanisms for transforming transport systems into more inclusive and just infrastructures (Turner & Grieco, 2000; Levy, 2013).

To move toward inclusive planning, several strategic actions are essential. First, transportation agencies must institutionalize gender mainstreaming across all levels of planning—from initial data collection to project evaluation. This involves collecting sex- and gender-disaggregated data, conducting gender impact assessments, and designing transport networks that respond to diverse needs such as trip chaining, off-peak travel, and safety. Second, agencies should integrate participatory planning methods into all stages of infrastructure development, ensuring that underrepresented voices—especially women, persons with disabilities, and low-income groups—are not just consulted but meaningfully engaged. Third, governments should commit dedicated funding and training to develop technical capacity in gender analysis, especially among transport planners, engineers, and policymakers. Additionally, incorporating gender-sensitive performance indicators into transport project evaluations can ensure accountability and sustained focus on equity outcomes.

Technological innovation also presents opportunities to bridge gaps in access and safety, but only if it is accompanied by inclusive design principles. Governments and developers must ensure that digital solutions are equitable, address the digital divide, and are co-developed with marginalized communities to avoid unintended biases (Crawford, 2021; UN-Habitat, 2020). Moreover, cross-sectoral collaboration between transportation, gender ministries, and civil society organizations can create more holistic and responsive policy ecosystems.

There remains significant scope for future research. One urgent area is the development of comprehensive, intersectional mobility datasets that capture not only where and how people move, but why they move—and what constraints they face. Longitudinal studies could provide deeper insights into how gendered mobility patterns evolve in response to changes in policy, urban form, and technology. Additionally, comparative studies across global cities, especially in

the Global South, could uncover context-specific best practices and challenges in implementing gender-responsive transport policies. There is also a growing need to explore the gendered implications of emerging mobility trends such as micro-mobility, ride-hailing platforms, and autonomous vehicles.

In conclusion, equitable transportation planning demands more than surface-level adjustments—it requires a paradigm shift toward justice, inclusivity, and responsiveness. Incorporating gender analysis not only addresses historical and structural inequalities but also leads to more efficient, safe, and user-centered mobility systems for all. As cities and nations confront growing challenges related to climate change, urbanization, and social fragmentation, gender-equitable transport is not just a moral imperative—it is a strategic necessity.

### References:

- Bustamante, V. (2015). Gender and Urban Transport: Smart and Affordable. World Bank Blog. <https://blogs.worldbank.org/transport/gender-and-urban-transport-smart-and-affordable>
- Butler, J. (1990). *Gender Trouble: Feminism and the Subversion of Identity*. Routledge.
- Crane, R. (2007). Is there a quiet revolution in women's travel? Revisiting the gender gap in commuting. *Journal of the American Planning Association*, 73(3), 298–316. <https://doi.org/10.1080/01944360708977979>
- Crawford, K. (2021). *Atlas of AI: Power, Politics, and the Planetary Costs of Artificial Intelligence*. Yale University Press.
- Crenshaw, K. (1989). Demarginalizing the intersection of race and sex. *University of Chicago Legal Forum*, 139–167.
- Greed, C. (1994). *Women and Planning: Creating Gendered Realities*. Routledge.
- Greed, C. (2005). Overcoming the factors inhibiting the mainstreaming of gender into spatial planning policy in the United Kingdom. *Urban Studies*, 42(4), 719–749. <https://doi.org/10.1080/00420980500060368>
- Greed, C. (2011). Planning for gender equality in urban transport. In *The Ashgate Research Companion to Planning Theory*.
- Hanson, S. (2010). Gender and mobility: new approaches for informing sustainability. *Gender, Place & Culture*, 17(1), 5–23. <https://doi.org/10.1080/09663690903498225>
- Hanson, S., & Pratt, G. (1995). *Gender, Work and Space*. Routledge.
- Law, R. (1999). Beyond 'women and transport': towards new geographies of gender and daily mobility. *Progress in Human Geography*, 23(4), 567–588. <https://doi.org/10.1191/030913299676200701>

- Levy, C. (2013). Travel choice reframed: “Deep distribution” and gender in urban transport. *Environment and Urbanization*, 25(1), 47–63. <https://doi.org/10.1177/0956247813477810>
- Lucas, K. (2012). Transport and social exclusion: Where are we now? *Transport Policy*, 20, 105–113. <https://doi.org/10.1016/j.tranpol.2012.01.013>
- Lucas, K. (2012). Transport and social exclusion: Where are we now? *Transport Policy*, 20,
- Ng, W. S., & Acker, A. (2018). Understanding urban travel behaviour by gender for efficient and equitable transport policies. *International Transport Forum Discussion Paper No. 2018/01*. <https://doi.org/10.1787/eaf64f94-en>
- Peters, D. (2001). Gender and transport in less developed countries: A background paper in preparation for CSD-9. United Nations Commission on Sustainable Development.
- Rosenbloom, S. (2006). Understanding women’s and men’s travel patterns: The research challenge. In *Research on Women’s Issues in Transportation* (Vol. 1, pp. 7–28). Transportation Research Board.
- Sheller, M. (2018). *Mobility Justice: The Politics of Movement in an Age of Extremes*. Verso.
- Turner, J., & Grieco, M. (2000). Gender and time poverty: The neglected social policy implications of gendered time, transport and travel. *Transport Policy*, 7(3), 179–188. [https://doi.org/10.1016/S0967-070X\(00\)00004-6](https://doi.org/10.1016/S0967-070X(00)00004-6)
- UN-Habitat. (2013). *Planning and design for sustainable urban mobility: Global report on human settlements 2013*. Routledge.