Gender Analysis of a Women-Friendly City: A Case Study of Subang Jaya

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ABSTRACT

As Malaysia's first designated Women-Friendly City, Subang Jaya provides a unique opportunity to examine how gendered perspectives shape urban design and public perception. This study applies gender analysis to assess the planning, implementation, and post-occupancy stages of the city's development. Through a review of local gender-mainstreaming policies, site observations, expert interviews, and a survey of 200 residents, the research highlights critical gaps and successes in gender integration. Findings indicate limited collaboration between women-friendly city planners and gender policy experts during the planning phase, leading to only partial implementation of gender-responsive measures. Nevertheless, survey results reveal that both women and men generally perceive Subang Jaya as safe. Notably, gender differences in safety priorities emerge: men tend to value CCTV surveillance, while women place greater importance on active safety features like emergency call buttons. This suggests a preference among women for proactive safety mechanisms over passive monitoring systems. The paper argues that embedding a gender-sensitive approach in urban planning is crucial to building inclusive, equitable, and responsive cities—offering important insights for Subang Jaya's continued evolution as a Women-Friendly City.

Keywords: Gender Equality; Inclusive City; Women-Friendly City ; Gender Analysis; Urban Planning

INTRODUCTION

In recent years, there has been a growing emphasis on inclusiveness in urban development, particularly in areas such as inclusive city, and the safety and freedom of women (Datta, 2021). Studies have highlighted the inclusiveness of access to Information and Communication Technology (Othman et al., 2023) and the role of smart technology in designing inclusive urban public spaces (German et al., 2023; Itair et al., 2023). Furthermore, the fields of transportation and mobility have garnered significant attention, especially regarding women's experiences. Research has explored women's transportation modes (Uteng and Susilo, 2021), sustainable transportation practices (Bamwesigye and Hlavackova, 2019), and women's representation in the smart transportation sector (Monteagudo and Colleoni, 2021; Pirra et al., 2021). Other studies focused on ICT-driven mobility services and gender considerations in smart mobility solutions (Mostofi, 2022; Singh, 2020; Lindkvist, 2024).

Cities such as Vienna have proactively incorporated gender considerations into urban planning, prioritising women's safety and accessibility in public space development (Young, 2024). These efforts offer empirical evidence that supports gender equality improvements in urban development. Globally, only 10% of the leadership roles in urban planning are occupied by women (Terraza et al., 2020).

Despite the increased focus, urban development often fails to fully integrate the principles of gender equity and inclusion (UN-Habitat, 2020). Feminist scholars argue that planning remains androcentric, neglecting women's distinct urban experiences such as mobility patterns, caregiving roles, and safety concerns (Hanson, 2023; Sánchez de Madariaga and Neuman, 2021). In addition, the rise of smart cities, although promising in terms of efficiency and connectivity, has intensified gender-blind spots. Male-dominated STEM fields shape technologies that often overlook women's needs (Wajcman, 2023; Datta, 2022). However, some interventions

(for example CCTV, emergency apps, and ride-hailing equity) exist, and broader issues of bias in AI, IoT, and digital governance remain underexplored (Bansal et al., 2023).

Nevertheless, pioneering efforts like Vienna's gender-mainstreaming policies and Dubai's AI-driven public transport safety features show potential, even though cultural limitations persist (Urban Development Vienna, 2021; Fedorenko and Kolos, 2023). In Southeast Asia, Jakarta's Kota Ramah Perempuan and Kuala Lumpur's safety audits indicate progress but lack systemic integration of gender-responsive smart technologies (UN Women, 2023).

Among these global efforts, Subang Jaya stands out as a significant case. Recognised in 2017 as Malaysia's first Women-Friendly City by the Ministry of Women, Family, and Community Development, Subang Jaya implemented initiatives such as gender-responsive design, safer public spaces, and gender budgeting (MBSJ, 2022).

Discussing women-friendly cities has become increasingly relevant owing to rapid urbanisation, growing inequalities, and the pressing need for sustainable solutions. These initiatives propose innovative approaches to enhance resilience and quality of life, while aligning with global development goals. Notably, SDG 11 (Sustainable Cities and Communities) advocates for inclusive, safe, resilient, and sustainable urban areas (Feng et al., 2023; Rauf et al., 2023), and Target 11.7 specifically promotes access to safe public spaces for women and marginalised groups (UN, 2015). The intersection of SDG 11 with goals such as poverty reduction (SDG 1), education (SDG 4), clean water and sanitation (SDG 6), clean energy (SDG 7), economic growth (SDG 8), and climate action (SDG 13) further underscores its importance (Vaidya & Chatterji, 2020).

Limited research on women friendly city design and gender equality has shown that gender-sensitive urban planning significantly enhances women's safety, accessibility, and wellbeing (Barnes, 2021; Yadav and Kumari, 2021; Gutiérrez Mozo, 2020; Rampaul and Magidimisha-Chipungu, 2022; Campisi et al., 2022). Empowerment is central to this process, enabling women to participate in decision making and shape the spaces they inhabit (Morrow, 2018). Integrating gender perspectives into urban planning ensures that women's voices are heard, needs are met, and public spaces become more inclusive (Dalu and Manyani, 2020).

Against this backdrop, this study investigates Subang Jaya as a critical case study. Recognised as Malaysia's first Women-Friendly City, Subang Jaya provides a unique context for examining the outcomes and challenges of gender-responsive urban initiatives. This study evaluates how urban planning in Subang Jaya addresses women's needs through a gender perspective.

LITERATURE REVIEW

Gender Mainstreaming

Originating from the 1996 Beijing Conference, the concept of Gender Mainstreaming represents a commitment to transforming the gender dynamics in public policies. This shift has moved from a singular focus on specific objectives to a broader approach that emphasises structural change. A key aim of this initiative is to incorporate gender perspectives into legislation, public policies, programmes, and projects. The European Union has embraced this idea, recognising Gender Mainstreaming as a fundamental element for integrating gender perspectives into its policies (Pollack and Hafner-Burton, 2000). Despite widespread international support, the academic community continues to debate the concept of gender mainstream. Numerous definitions exist, with those from the UN Economic and Social Council, the European Institute for Gender Equality (EIGE), and the Council of Europe (1998) being among the most widely accepted (Rees, 2005). However, these definitions have sparked considerable discussion on the essence of Gender Mainstreaming. There is some consensus on distinguishing its role as a concept, strategy, vision, or practice (Daly, 2005; Otero-Hermida and Lorenzo, 2020; Pollack and Hafner-Burton, 2000; Walby, 2005).

From a theoretical standpoint, Gender Mainstreaming has been identified as one of the three frameworks within gender policy (Rees, 2005; Booth & Bennett, 2002; Verloo, 2005). According to Verloo (2005), these frameworks include the equal opportunity approach, specific equality policies, and gender mainstream. The primary distinctions between the third framework and the other two are their focus and objectives. While the first two frameworks concentrate on women as individuals or groups, Gender Mainstreaming adopts a

transformative approach by focusing on structures. The intervention logic of this framework views policymaking as a process that is not neutral and that has the potential to perpetuate existing inequalities, thus necessitating transformation (Lombardo et al. 2017).

From a strategic standpoint, policymakers can systematically employ the Gender Mainstreaming tool to rule, structure, process, and policy to institutionalise the integration of gender mainstreaming (Daly, 2005). This perspective interprets Gender Mainstreaming in terms of policies, goals, and actions aimed at achieving gender equality. Verloo's (2005) words help us better grasp the distinction between Gender Mainstreaming as a concept and strategy. In her research, she refers to the term' integrationist process" to describe the method of incorporating the gender perspective into existing policy paradigms or frameworks, which represents the strategic perspective. Based on this definition, Gender Mainstreaming, as a strategy, lacks substantive implications. It can be applied concurrently through various policy frameworks (Booth and Bennett, 2002). Policymakers can implement gender mainstreaming through policies with diverse orientations, which is almost a technocratic application of the tool (Walby, 2005). Strategically, no uniform explanatory logic exists for gender inequality. That is, policymakers have neither pinpointed the primary cause of gender inequality nor selected a specific policy tool to tackle it; they have not crafted gender policies according to a particular policy framework (Verloo, 2005).

In short, we can say that, according to the literature, gender mainstreaming is a concept related to a specific political framework, i.e., a logic of intervention, to achieve the objective of gender equality, and at the same time, it is a strategy, i.e., a protocol of intervention. When analysing its implementation in policies, this peculiarity obliges us to consider those dual conceptions and analyse Gender Mainstreaming with different methodologies, depending on the perspective of interest. On the one hand, the search for gender in all phases of the public policy cycle and, on the other hand, the reconstruction of the political framework of the gender initiatives of the actions should be considered.

The Local Dimension As A Social And Institutional Context

The local scale is a privileged space for studying urban policymaking, as the competences and autonomy of cities in urban planning and development are at the municipal level. From a multilevel perspective, cities concentrate on political power and wealth. Investments are being made to finance major urban development events and projects (Brenner et al., 2010; Pinson, 2022; Rossi and Vanolo, 2010), while simultaneously increasing displacement and spatial segregation (Harvey, 1996; Wacquant, 2008). From a social perspective, urban planning plays a fundamental role in producing and reproducing cities and urban inequalities (Leal and Sorando, 2015; Leal Maldonado, 2002; Swyngedouw et al., 2002). While many intersectionalities (e.g., age, sexual orientation, "race1") shape urban dynamics. Planning has had a meaningful impact on the reproduction of gender inequality. Urban planning has historically been developed by men for men (Bondi, 1998; de Madariaga and Neuman, 2020; Gilbert, 1997; Hayden, 1980; McDowell, 1983, 2000), and, as Greed and Reeves (2005) point out, specific gender roles result from different uses of the environment. Indeed, space is socially produced and the result of multiple power relations between entities, agents, and forces that shape reality (e.g. Harvey, 1996; Massey, 1994; Soja, 2000, 2010).

Furthermore, planning incorporates a vision of the future and therefore plays a fundamental role in securing opportunities for women (Beebeejaun, 2017). One strand of feminist geography suggests that the division of urban spaces reflects the sexual division of labour. Women are designated for reproductive and private roles and excluded from the productive sphere, which is political, economic, and public (Blumen, 1994; Carrasco, 2019; Orozco, 2014). This mechanism is exercised through the planning of the urban structure (Beebeejaun, 2017; Bondi, 1998; de Madariaga, 2004) and the public transport system (Blumen, 1994; de Madariaga, 2004), which influences the use of time (Sayer, 2005), security, lack of security, and the narrative of urban insecurity (Valentine, 1989; Pain, 2001; Fenster, 2005). All of these elements alienate women from public spaces. Masculinised planning is therefore unable to capture different non-masculine needs. This bias increases barriers to equal opportunities and highlights the need for gender planning (Dym´en and Ceccato, 2012; Listerborn, 2007).

In Malaysia, the urban landscape is not merely a backdrop for social dynamics but is shaped by overlapping institutional frameworks at the national and regional levels, where ASEAN plays a significant role. Within the

ASEAN, both urban development and gender equality have emerged as important issues. Urban development has gained momentum, particularly through initiatives such as the ASEAN Sustainable Urbanisation Strategy (ASUS), which emphasises inclusive and equitable urban growth (ASEAN Secretariat, 2020). Similarly, gender equality has been embedded within ASEAN frameworks since the ASEAN Declaration on the Gender-Responsive Implementation of the ASEAN Community Vision 2025, though it is often approached from a broad social perspective without explicit urban-specific gender directives (ASEAN, 2017).

At the Malaysian national level, gender mainstreaming is a long-standing commitment, guided by policies such as the National Policy on Women 2009, and reinforced through Malaysia's obligations under the Convention on the Elimination of All Forms of Discrimination Against Women (CEDAW). However, similar to the European context, evidence suggests that while general inequalities are acknowledged in Malaysia's urban planning documents, gender-specific urban inequalities are often not explicitly highlighted (Ministry of Women, Family, and Community Development, 2019). Despite this, the integration of gender perspectives is required in national planning frameworks, such as the Shared Prosperity Vision 2030 and the 12th Malaysia Plan (Economic Planning Unit, 2021), where inclusive development goals implicitly call for gender-sensitive urban interventions.

Malaysia's institutional structure also mirrors a multilevel approach, where responsibility for implementing gender mainstreaming is distributed across the federal, state, and municipal levels. At the federal level, the Ministry of Women, Family, and Community Development oversees national gender policies and strategies, whereas state governments are encouraged to develop localised gender-responsive policies. For example, Selangor's Women Empowerment Agenda (2020–2025) outlines regional commitments to gender inclusivity in public infrastructure and governance (Selangor State Government, 2020). At the municipal level, some local authorities have introduced gender-responsive budgeting and planning initiatives, although their institutionalisation and effectiveness vary across jurisdictions.

Thus, although Malaysia recognises the importance of gender mainstreaming in urban policies at multiple governance levels, challenges remain in ensuring that gender considerations are consistently and explicitly integrated throughout the policy cycle. As in the ASEAN framework, Malaysia's approach relies heavily on national, regional, and local authorities to interpret and implement gender mainstreaming measures without singular binding guidelines. This decentralised model means that while gender mainstreaming is formally recognised, its practical application in urban development projects is often uneven, depending on the local political will, resources, and institutional capacity.

Academic research on gender mainstreaming in urban planning is limited. However, several studies have explored the critical dimensions of this issue. One study conducted in Perlis investigated gender-related barriers to effective public participation in land use planning. The findings revealed that while gender did not significantly influence overall participation barriers, male respondents reported a more positive experience regarding exclusion from the participation process compared to their female counterparts (Saad, Zulkifli, & Hassan, 2024). This suggests that women may still face subtle forms of exclusion in participatory urban processes, underscoring the need for gender-sensitive engagement strategies.

Additionally, broader regional studies have examined the intersection of gender equality and the development of smart, sustainable cities. A recent literature review emphasised the importance of incorporating gender-sensitive design principles and leveraging advanced technologies to create more inclusive urban environments that address the specific needs of women and marginalised groups (Frontiers in Sustainable Cities, 2025). These emerging findings highlight the necessity of further academic enquiry into the gender dimensions of urban planning in Malaysia, particularly as the country moves towards achieving sustainable and equitable urban development.

Inclusive City

The concept of an inclusive city was initially perceived as a nebulous urban entity that was intricately linked to various aspects of urban development (Meena and Singh, 2010). Numerous definitions for inclusive cities have been proposed. First advocated by the United Nations in 2001, an inclusive city is characterised as a locale where all individuals, irrespective of their economic status, gender, race, ethnicity, or religion, are enabled and

empowered to fully engage in the social, economic, and political opportunities available (Berrone and Joan, 2022). Subsequently, this concept was further elaborated. The Asian Development Bank (2022) extends the notion to encompass liveability, defining an inclusive city as one that "creates a safe, liveable environment with affordable and equitable access to urban services, social services, and livelihood opportunities for all the city's residents and other city users to promote optimal development of its human capital and to ensure the respect of human dignity and equality.

While the precise definition of an inclusive city remains a subject of debate, numerous public institutions and scholars have analysed the concept through various dimensions. At the policy level, the World Bank (2015a) posited that an inclusive city encompasses a complex interplay of spatial, social, and economic factors. The New Urban Agenda (UN-Habitat, 2016) envisions inclusive cities as those that prioritise safe, accessible, green, and high-quality public spaces conducive to family life, fostering social and intergenerational integration, and promoting social cohesion, inclusion, and safety within peaceful and pluralistic societies. Scholars have provided more detailed descriptions of the dimensions of inclusive cities. Robin (2014) emphasizes that political, social, economic, and environmental aspects are all critical components of an inclusive city, and excelling in these areas is essential for achieving inclusive city status. Liang et al. (2022) further identify five conceptual dimensions of inclusive cities: social inclusion, economic inclusion, spatial inclusion, environmental inclusion, and political inclusion. These dimensions are interrelated and mutually reinforcing, thereby influencing a city’s overall inclusiveness (Liang et al., 2022).

This study utilises five holistic dimensions of inclusive city development derived from a comparative analysis of the definitions and dimensions of inclusive cities. These dimensions are primarily informed by research conducted by Liang et al. (2022), which offers the most comprehensive categorisation of inclusive city dimensions, whereas other studies address only a subset of these dimensions. Moreover, our study does not fully adopt the definitions of these five dimensions; rather, it integrates perspectives from other researchers and organisations, resulting in a more comprehensive and representative definition of dimensions, as illustrated in Table 1.

TABLE I: Conceptual dimensions of inclusive cities: authors' adjustment of Liang et al. (2022)

Dimension	Description	Authors
Economic inclusion	Economic inclusion is the process by which individuals and households are gradually integrated into the broader economic and community development. By alleviating material inequities and addressing structural barriers to marginalized groups, their economic conditions and status are improved.	Andrews et al. (2021); Liang et al. (2022); World Bank (2015b)
Social inclusion	Social inclusion is the process of making all groups of people within a society, especially people who are disadvantaged on the basis of age, sex, disability, race, ethnicity, origin, religion, economic, or other statuses, feel safe, involved, valued, and respected.	Anttiroiko and de Jong (2020b); World Bank (2015b)
Spatial inclusion	Spatial inclusion requires cities to provide affordable land and housing in strategic places, and accessible public infrastructure and basic services, such as hospital and medical services, energy infrastructure, waste management, ICT infrastructures, etc.	Elias (2020); Liang et al. (2022); World Bank (2015a)
Environmental inclusion	Environmental inclusion requires that contemporary human beings do not carry out their mode of production and consumption in such a manner that the needs and interests of future generations are sacrificed. To achieve this goal, climate change mitigation and adaptation, sustainable transportation, and environmental protection are suggested.	Liang et al. (2022); Elias (2020); UN-Habitat (2016)
Political inclusion	Political inclusion means that every citizen should have equal rights and opportunities to participate in and contribute to the functioning of democratic institutions and processes. These institutions and processes include elections, legislative processes, political parties, and parliament composition, etc	Bilodeau et al. (2020); Liang et al. (2022)

Women-Friendly City

A women-friendly city was conceptualised in the 1970s, starting with the claim that women's activists in North America should ensure women's safety in daily life. The discussion in the 1980s centred on women's safety in urban planning and how urban operations should be integrated from a gender perspective. The concept of women-friendly cities was spread around the world through the 'European Declaration for Urban Women (ECWC)' in 1994 and 'UNHabitat II Urban Women's Life' in 1996. This was the first official discussion of building gender-equal cities.

Earlier studies, from 1987 to 2010, focused mainly on the concepts of justice, participation, and equality in shaping women-friendly environments. Hernes (1987) introduced the idea of a woman-friendly city where women can balance work, family, and public life without facing greater sacrifices than men. Building on this foundation, Tokman (2009) emphasised the importance of making cities liveable for women through their active participation in local decision-making processes and equal access to urban spaces, while KWDI (2010) stressed the equal participation of men and women in community policy and development, ensuring women's safety and growth.

In the mid-decade from 2015 to 2019, discussions began to include more practical urban planning measures and critiques of social structures. Taewook (2015) highlighted the link between women-friendly cities and sustainable economic and family life, while Kiper et al. (2016) stressed the need for gender-responsive urban infrastructures, such as safe transportation, public spaces, and housing. Meanwhile, Meysam Zekavat and Arezoo Momenian (2018) as well as Esra Banu Sipahi and Erhan Örselli (2019) pointed out that structural and social norms continue to create barriers for women, arguing for an approach based on gender justice rather than simple equality.

The latest views from 2020 to 2022 reflect a shift toward systemic change and implementation of institutional programs to bring about real transformation. The Cities Alliance (2020) argued that women have not yet fully achieved the "right to the city", highlighting issues such as the gender pay gap, unsafe environments, and restricted mobility. They called for a paradigm shift in policymaking and citizen education to ensure the full participation of women in urban spaces. Building on this momentum, Cengiz et al. (2022) illustrated how programs such as the United Nations Women-Friendly Cities Joint Program work to guarantee women's access to essential services, protection from violence, and meaningful involvement in local planning and decision-making processes, emphasizing the need for gender-responsive urban development on a practical and institutional level.

There are several pertinent case studies showing the pragmatic uses of gender-responsive urban development in response to the demand for more complete knowledge of women-friendly city projects tackling gender equality (see Table 2)

Table II: Case Study on the Gender Responsiveness Urban Development

City	Initiative/ Project	Objectives	Strategies implemented	Outcomes	References
Barcelona	Smart lighting project	Improve safety for women in public spaces	Installation of smart lighting systems in high-risk areas	Reduced crime rates and increased women's sense of safety	Roberts, 2023; Veloso et al., 2024
Amsterdam	Gender-sensitive urban planning	Enhance accessibility for women	Inclusive design processes involving community feedback	Improved public transport services for women	Roberts, 2023; Veloso et al., 2024
Vienna	Gender mainstreaming Inurban planning	Create inclusive public spaces	Gender impact assessments in urban projects	Enhanced safety and accessibility for women	Young, 2024
Toronto	Smart city strategy	Promote gender equity in urban development	Community engagement initiatives focusing on women's needs	Increased participation of women in urban planning processes	Tierney, 2019

Jakarta	Multimodal public transportation evaluation	Assess service quality from a gender perspective.	Gender-based service quality evaluation, focus group discussions, surveys	Identification of service gaps and improvements in user satisfaction among different genders.	Owais et al., 2024
Singapore	Smart nation initiatives	Improve urban planning and quality of life through technology	Integration of IoT, data analytics, AI in urban planning and transportation.	Reduced traffic congestion by 35%, increased energy efficiency by 20%.	Chan and Chye, 2023
Tangerang City	Smart city initiatives for resilience	Enhance city resilience to disasters, including COVID-19	Development of software applications, community engagement programs	Improved disaster response capabilities and community awareness during emergencies	Kusumastuti et al., 2022
Lusaka	Gender equality and economic growth	Promote gender equality to boost economic development.	Policies for women's workforce participation, access to education and health services.	Increased women's participation in the economy, enhanced household incomes.	Ngulube et al., 2024
Pune	Smart city governance	Integrate citizen participation in urban governance and service delivery	Community engagement in budgeting and waste management processes.	Improved public services and citizen satisfaction through participatory governance.	Tayeng et al., 2024

RESEARCH METHODOLOGY

As defined by USAID (2017), gender analysis is "an analytic, social science tool that is used to identify, understand, and explain gaps between males and females that exist in households, communities, and countries, and the relevance of gender norms and power relations in a specific context." This process involved examining potential gender disparities and evaluating the impact of policies on men and women, which may be unintended and lead to adverse consequences.

One approach to conducting gender analysis involves examining the planning process, from the initial formulation of goals to the actual plan, implementation, and postimplementation evaluation. This was achieved by measuring the differences in how the resulting environmental impacts affected the male and female users.

Urban planning is often 'gender-blind', operating under the assumption that decisions benefit 'everybody'. However, this approach frequently leads to the default prioritisation of male experiences and perspectives. Oudshoorn et al. (2004) initially argued that this unconscious 'male default' overlooks the various ways in which environments impact women and men from different social backgrounds, ages, and abilities. Recent studies have reaffirmed and expanded on this criticism. For example, Gül et al. (2023) emphasised that urban spaces and infrastructure designed without a gender lens tend to reinforce inequalities, particularly in relation to mobility, accessibility, and safety. Their research showed that an inclusive urban design must intentionally address the lived experiences of all genders to mitigate these disparities. Similarly, Kyttä et al. (2022) highlight that traditional planning approaches often fail to consider the nuanced everyday spatial needs of women, such as childcare responsibilities, fear of violence, and dependency on public transportation.

Moreover, contemporary research cautions against relying on gender stereotypes in urban designs. As noted by the Gendered Innovations Initiative (2020), design decisions should be grounded in empirical evidence based on real users' needs, practices, and preferences. This is echoed in a recent work by Čolić Marković and Danilović Hristić (2025), who emphasise the importance of participatory planning that includes community-led insights from women and other marginalised groups to avoid the reproduction of exclusionary spaces. Gathering this evidence requires engagement through observations, structured surveys, and in-depth interviews

that capture the everyday experiences of diverse users. These participatory methods are crucial for producing urban spaces and infrastructure that are not only inclusive, but also responsive to the evolving needs of all residents. The steps in the gender analysis include the following:

(i) Evaluating past urban design and infrastructure practices through a gender perspective,
(ii) Mainstreaming gender analysis into design,
(iii) Analyzing users and services,
(iv) Obtaining user input, and
(v) Evaluation and planning (Schiebinger, 2019).

The gender analysis in this study was structured according to the gender mainstreaming process in urban planning and was reorganised into three phases: planning, implementation, and evaluation (see Table 1). To explore the gendered dimensions of Subang Jaya, various methods were employed, including a literature review focusing on a women-friendly city, a site study, expert interviews, and a resident survey conducted within Subang Jaya.

Table III Gender analysis through literature review, site study, interviews, and survey

Gender Mainstreaming in Planning	Literature Review Site Study	Interview	Survey
Planning Stage	√	√	
Implement Stage		√	
Post-Occupancy Evaluation Stage			√

First, the literature review concentrated on women-friendly city guidelines, with an emphasis on Subang Jaya's initiatives under the Women-Friendly City framework introduced by the Subang Jaya City Council (MBSJ). Key sources include urban development efforts to improve walkability, safety audits, and policy implementation to support inclusive public facilities. Additionally, the researchers reviewed various guidelines, including the New Urban Agenda (NUA), Sustainable Development Goals (SDG), Convention on the Elimination of All Forms of Discrimination Against Women (CEDAW), UN Security Council Resolutions (SCR), UNESCO Priority Gender Equality Action Plan (2014–2021, 2019 Revision), the United Nations Declaration on the Rights of Indigenous Peoples (UNDRIP), UN Human Rights, the Environment, and Gender Equality (2021), Selangor Women's Policy, and the Subang Jaya Women-Friendly City Action Plan.

Second, interviews were conducted with eight professionals, including urban planners, MBSJ representatives, gender studies academics, between February 2024 and April 2025. These semi-structured interviews (detailed in Table 4) aimed to understand how gender considerations are integrated into the planning and implementation of women-friendly city features within Subang Jaya.

Table IV Interviewee and selection criteria

Interviewee	Criteria Selection
City council member 1	Department of Corporate & Strategic Management
City council member 2	Department of Corporate & Strategic Management
Urban Planner 1	Department of Urban Planning
Urban Planner 2	Department of Urban Planning
City council member 3	Department of Community Development
City council member 4	Department of Community Development
Academic Expert	Academic Expert in Urban Sociology or Gender and Development Studies
State Assembly Women	State Assembly Women Of Subang Jaya

Third, a structured questionnaire survey was distributed between October 2024 and March 2025, targeting residents in several neighbourhoods across Subang Jaya, including SS15, the USJ, and Bandar Sunway. A total of 200 valid responses were collected with a balanced representation across gender and age groups (see Table 5). The survey explored daily walking behaviours, including frequency, duration, time of day, and purpose (Table 6). Further questions examined the residents' perceptions of pedestrian safety in Subang Jaya,

particularly in areas with higher foot traffic or near public transport stations. The survey assessed the perceived level of women-friendliness in public spaces and awareness of MBSJ's women-friendly city efforts.

Finally, the degree of awareness and perceived effectiveness of smart urban installations, such as CCTV, smart streetlamps, panic buttons, and emergency call boxes, were measured to evaluate their role in enhancing public safety and women's comfort in navigating urban spaces.

Table V Description of survey respondents

	Description	Number of Respondent		Total
		Male	Female	
Age	10–19 years	16	16	32
	20–29 years	22	18	40
	30–39 years	18	18	36
	40–49 years	16	14	30
	50–59 year	18	12	30
	60 and over	18	14	32
Total		108	92	200

Table VI Survey questions

Category	Description
Awareness of Specially Designed Zone for Women	i.Existence of Specially Designed Zone for Women within the district ii.Women-friendliness of district iii.Reason for women-friendliness iv.Elements needed for women-friendliness
Awareness of living in a smart city	i.Awareness of smart safe street within the district ii.Awareness of smart installations within the district iii.Important elements among smart city installations
Pedestrian behavior	i.Walking frequency ii.Average walking time per day iii.Time of walking (Mostly during the day/ night/both) iv. Walking destination
Awareness of safety	i.Safety level compared to other districts in Sejong City ii.Reason for being safer iii.Reason for not being safer
Respondents' characteristics	Address, sex, age, number of family members

Planning Stage

Subang Jaya has taken a pioneering step in urban development by becoming Malaysia's first officially recognised Women-Friendly City, underlining its commitment to inclusive, safe, and equitable urban living. This achievement reflects Subang Jaya City Council (MBSJ) proactive policies that address gender perspectives in city planning, safety, accessibility, and empowerment, particularly for women.

As defined by MBSJ and supported by Malaysia's Ministry of Local Government Development (KPKT) and the Ministry of Women, Family, and Community Development, a Women-Friendly City promotes equality in policy implementation, strengthens care networks, ensures community safety, and empowers women to actively participate in economic, social, and public life.

The Women Friendly City in Subang Jaya focuses on four strategies and actions proposed by Mayor YBrs TPr. Hajah Noraini binti Haji Roslan : (1) Healthy Lifestyle, (2) Socio-economic improvement; (3) Safe Cities; (4) Infrastructure.

Drawing inspiration from global best practices and localising solutions to fit the Malaysian context. Urban planning in these areas incorporates core principles such as

(i) Safe pedestrian environments with better lighting, open visibility, and surveillance systems such as CCTVs and emergency call buttons.
(ii) Universal accessibility, including pathways suitable for strollers, wheelchairs, and elderly pedestrians.
(iii) Mixed-use developments that locate essential services (schools, clinics, childcare centres, and public transport) within walkable distances to support women's daily routines.
(iv) Gender-responsive infrastructure, with community feedback integrated into the planning process, especially from women and grassroots organisations.

In the spirit of becoming a women-friendly city, Subang Jaya has integrated ICT and urban safety systems, such as Safe City surveillance networks, smart LED lighting in parks, and emergency response systems, to create a safer environment, particularly for women in the dark. These align with the Crime Prevention through Environmental Design (CPTED) principles and reflect the international women-centric urban planning standards.

Subang Jaya's Strategic Plan 2020–2025 and its Voluntary Local Review (VLR) 2021 explicitly incorporate gender equality and empowerment under the Sustainable Development Goals (SDGs), particularly SDG 5 (Gender Equality), SDG 11 (Sustainable Cities and Communities), and SDG 16 (Peace, Justice and Strong Institutions). The VLR highlights Subang Jaya's Women-Friendly City initiative as a key project under the Local4Action HUB framework of the United Cities and Local Governments (UCLG).

One of the most significant aspects of Subang Jaya's women-friendly planning was its emphasis on gender-inclusive participation and gender-disaggregated data collection. The MBSJ actively conducts public engagement sessions and community feedback workshops, particularly those targeting women from diverse socioeconomic backgrounds. These insights can guide urban planning and help to identify barriers to mobility, safety, and access to services.

Local women's voices influence decisions regarding the location and design of public transport stops, distribution of childcare centres, and the layout of green spaces and safe zones. Recognising that women have different mobility patterns and safety perceptions than men, especially at night or when caring for children, the city's planning mechanisms aim to respond directly to these realities.

Subang Jaya's recognition as the first Women-Friendly City in Malaysia is not just symbolic but operational—setting a precedent for other Malaysian cities to follow. This shows how gender-sensitive urban planning and community co-design can come together to foster inclusive, liveable, and sustainable environments for everyone.

Through a literature survey and expert consultations, checklist items were selected based on recognised standards for women-friendly city and safe pedestrian environments. These items reflect key criteria, including active participation of women in the planning process and the integration of a gender perspective in urban design. A women-friendly city requires urban spaces that accommodate the distinct needs of both women and men across different age groups. This includes incorporating gender- and age-sensitive design standards, ensuring balanced participation of male and female experts, and gathering feedback directly from female residents.

Table 7 outlines the selected guidelines for safe pedestrian environments from the Subang Jaya Guidelines for Public Facilities for a Women-Friendly City. These guidelines indicate that the integration of gender-sensitive urban planning must continue. In many cases, women-friendly city planning has been developed in silos, resulting in limited synergy. Interviews with planners highlighted that gender perspectives were not well integrated into Subang Jaya's smart city development strategies, although Subang Jaya's broader urban planning incorporates elements of Crime Prevention Through Environmental Design (CPTED).

Experts have noted that smart city solutions are primarily based on 'gender-neutral data', which overlook differences in user experience. For example, the use of CCTV and smart lighting is often planned without

considering how women and men perceive safety in different ways. An urban planner from MBSJ emphasised the limitations of current crime data, stating that CCTV only captures one angle, and big data on crime is difficult to access owing to privacy concerns. In-person crime reporting and feedback systems have been suggested as reliable and gender sensitive tools. They also highlighted the need for inclusive smart services, such as a safe return home service or facial recognition CCTV tailored for vulnerable groups including women.

Furthermore, a women-friendly city expert stressed the lack of gender disaggregated data in current planning practices. Without this, it is impossible to analyse the different mobility patterns between men and women. For instance, women tend to experience more anxiety when walking alone at night and are often responsible for caregiving, making them more sensitive to the distance between public amenities such as schools, daycare centres, and transport hubs. As such, gendered data collection is essential for identifying urban areas that may pose greater safety risks for women and for informing more inclusive and responsive urban planning in Subang Jaya.

Table VII Selecting Pedestrian Safety and Relevant Items from Subang Jaya Guidelines for Public Facilities for a Women-Friendly City

Category	Checklist	Selected Guidelines (Subang Jaya Context)
Urban Planning	Principles for a Convenient Pedestrian Environment	i,Improve pedestrian accessibility by eliminating curbs and uneven pavements. ii.Ensure barrier-free walkways linking residential areas, schools, and public facilities.
	Safety in Urban Design	i.Install sufficient lighting, CCTV, and emergency call buttons along walkways, parks, and near transit stops. ii.Apply Crime Prevention Through Environmental Design (CPTED) principles, especially around trail entrances and parks.
	Support for Work-Life Balance	i.Promote integrated planning by co-locating childcare centers, healthcare, and community centers along pedestrian-accessible corridors. ii.Address the lack of centralized support services within walking distance.
	Linking Functions Centered on Streets	i.Prioritize pedestrian access to public buildings (e.g., MBSJ offices, clinics, childcare, and cultural centers) along active street frontages. ii.Revitalize vacant roadside lots with public amenities to enhance walkability and social interaction.
Urban Infrastructure	Safe Walking Space	i.Maintain consistent lighting levels along main pedestrian paths with a minimum illumination of 20 lux. ii.Improve sidewalk conditions, reduce trip hazards, and ensure covered walkways especially near commercial zones and public transport stations.
	Illumination Around Pedestrian Crossings	i.Ensure well-lit pedestrian crossings, targeting 500 lux illumination, especially near schools, bus stops, and high-traffic junctions.
	Lighting Installation	i.Install pedestrian-scale lighting on all major walkways and pedestrian crossings, especially in high footfall areas like SS15, USJ, and Bandar Sunway.
	Crime Prevention Facilities	i.Install CCTV surveillance and emergency intercom systems in identified high-risk areas (e.g., bus stops, secluded walkways). ii.Collaborate with local law enforcement for real-time monitoring.
	Secure Sight Lines	i.Design clear sight lines by managing landscaping, street furniture, and tree placement to reduce blind spots.
	Safe Crosswalk Design	i.Install raised or table-top pedestrian crossings especially near schools and residential areas. ii.Mark school zones and children's safety paths clearly with visible signage and color-coded pavement.

Implementation Stage

Subang Jaya's ambition to become a women-friendly city is visible in policies promoting walkability, safety, and community participation. However, challenges have emerged at the implementation stage, highlighting a disconnect between planning and execution, similar to the issues observed in other city developments.

In Subang Jaya, several neighbourhoods, such as SS15, USJ, and Bandar Sunway, have been earmarked for urban renewal and pedestrian safety improvements. These initiatives align with women-friendly city principles, particularly in high footfall zones. However, despite the inclusion of these principles in planning documents, their actual implementation has been inconsistent. Street lighting, secure walkways, and gender-sensitive design standards are often compromised during construction, owing to budgetary constraints or conflicting priorities among stakeholders. For example, proposals to extend the use of public-school facilities after school hours to support working mothers with childcare have not been realised. School administrators raised concerns about security risks, operational burdens, and the lack of clear policy directions from the Ministry of Education. This has resulted in missed opportunities to support work-life balance for women, especially in lower-income households. Moreover, the integration of smart city components with gender-inclusive planning remains weak. Subang Jaya has invested in smart surveillance systems (CCTV, smart lighting, etc.), yet these were developed without a gendered lens. Interviews with local officials revealed that urban safety initiatives under the smart city umbrella rarelydifferentiate between male and female users and do not systematically collect gender disaggregated data. A member of the MBSJ council acknowledged, "Most of the urban improvements are based on general smart city frameworks. No dedicated monitoring mechanism has focused on women's experiences in public spaces. We assume improvements are gender-neutral, but that's not always the case." Urban planners and architects involved in the development of Subang Jaya also expressed frustration. A local female architect shared, "In many cases, we consulted only after the master plan was finalised. By then, the physical layout had already been fixed, making it difficult to retrofit women-friendly principles meaningfully. The core of the issue is not embedding gender considerations early in the planning process." This reflects a larger issue in Malaysian urban governance: fragmentation among agencies involved in city planning and operation. For example, state and federal agencies, MBSJ, developers, and private contractors often operate silos. When projects are handed over from developers to local authorities, knowledge transfer is minimal, resulting in confusion regarding operational responsibilities and weak post-occupancy management. As one official commented, "It's hard to trace who's accountable when facilities don't function as intended. This delays necessary adjustments, especially those affecting safety and accessibility for women."

Crucially, women's participation in planning and implementation remains insufficient. Engagement often happens too late—at the point of post-occupancy evaluations (POE)—when most infrastructure decisions have already been made. Experts emphasise the need to establish participatory governance models at the community level where women can influence planning from the outset. A local women-friendly city advocate remarked, "It's not just about asking women what they want—it's about building a system where their feedback continuously shapes policy and implementation." A smart city consultant working with MBSJ supported this view, stating that citizen-led smart initiatives are gaining traction through pilot projects and hackathons, but we lack a formal mechanism to collect, integrate, and act on feedback, especially from underrepresented groups such as women, the elderly, and single mothers. We need inclusive governance and targeted budgets to support this shift." In conclusion, while Subang Jaya's women-friendly city vision is commendable, the lack of coordination among stakeholders, limited early-stage participation of women, and absence of gendered data collection undermines its realisation. Moving forward, a community-based governance structure and institutional frameworks that prioritise gender inclusion are essential for bridging the gap between planning and reality.

Post-Occupancy Evaluation Stage

In Subang Jaya, Post-Occupancy Evaluations (POEs) are an underutilized instrument in the domains of urban development and city planning. Despite the rapid development of new townships such as USJ Heights, Putra Heights, and certain areas of Bandar Sunway under the branding of smart and liveable cities, there remains a paucity of formal evaluation mechanisms that incorporate residents' feedback, particularly from a gender perspective. To explore gender-related patterns in public space usage, a community survey was conducted

across selected residential zones in Subang Jaya with an emphasis on maintaining a balanced gender ratio among respondents. The survey examined walking behaviour across sexes. Attest analysis revealed that men and women in Subang Jaya showed no significant differences in walking frequency, time, or duration. This indicates that the general walking environment is perceived as comparably usable and accessible for both genders, a positive reflection of the city's efforts to improve pedestrian infrastructure, including walkable sidewalks and connected green corridors. However, differences were evident in walking destinations, reinforcing existing studies that highlight gendered mobility patterns. Men in Subang Jaya were more likely to walk to commercial areas such as SS15, Summit USJ, or Da Men Mall, whereas women walked more often to leisure-oriented spaces such as parks, playgrounds, or community gardens in areas such as USJ 2, Subang Ria Park, or Subang Jaya Linear Park. Moreover, a higher proportion of women reported walking to transit stops and bus hubs, such as BRT and LRT stations, compared to men, reflecting a stronger reliance on public transport among women for daily mobility needs (Tables 8 and 9).

Table VIII Gender differences in walking destinations.

Desrtination (Multiple Choice)	Commercial Facilities	Educational Facilities	Bus Stop	Public Instituitions	Parks/Streams/Other Green Areas	Others
Total	43.0	25.0	38.0	26.0	41.0	2.0
Male	50.0	27.8	35.2	25.9	33.3	1.9
Female	34.8	21.7	41.3	26.1	50.0	2.2

Table IX Gender differences in pedestrian behaviour in Subang Jaya

	Average		Standard Deviation		t-Value	p-Value
	Male	Female	Male	Female		
Frequecy	2.52	2.54	1.255	1.206	-0.101	0.920
Duration	3.56	3.63	1.127	1.082	-0.337	0.737
Day/night time	1.91	1.83	0.708	0.643	0.597	0.552

must be capitalized exceptRegarding the perception of pedestrian safety, approximately 47% of residents believed that Subang Jaya's newer developments offered safer walking environments compared to other areas, while only 16% perceived them as less safe. Interestingly, there were no significant gender differences in overall safety perception, indicating an increasing baseline of confidence in the city's walkability initiatives. However, certain zones—especially dimly lit or under-patrolled back alleys near commercial districts—continue to evoke concern among women, especially after dusk (Table 10)

Table X Safety relative to other districts ($p < 0.01$)

	Safety Relative to Other Districts (%)			Total	Average	Standard Deviation	t-Value	p-Value
	Yes	No	No Difference					
Total	47.0	16.0	37.0	100.0				
Male	37.0	16.7	46.3	100.0	1.80	0.711	1.580	0.117
Female	58.7	15.2	26.1	100.0	1.57	0.750		

In terms of gender inclusivity, 58% of respondents viewed Subang Jaya's public spaces as women friendly. Gender breakdown showed that 60.9% of women agreed with this statement compared to 55.6% of men, suggesting that female residents feel slightly more positive about the inclusivity efforts made by the city council (MBSJ), especially where community programs, better lighting, and surveillance are present.

Despite these advantages, awareness of specific gender-targeted initiatives, such as designated women-friendly zones or smart safety corridors (e.g. areas monitored with CCTVs or equipped with panic buttons), was remarkably low. More than 60% of the surveyed residents said they were unaware of such initiatives, with women displaying twice the level of awareness as men. This may suggest that communication and public outreach strategies are not effectively reaching male residents, or that such initiatives are not visibly branded or signposted (Table 11)

Table XI Correlation Between

		Gender	Awareness of Specially Designed Zone for Women	Awareness of Safe Street
Gender	Pearson Correlation Sig (2-tailed) N	1 100	-0.311** 0.002 100	-0.269** 0.007 100
Awareness of Specially Designed Zone for Women	Pearsom Correlation Sig (2-tailed) N	-0.311** 0.002 100	1 100	0.879** 0.000 100
Awareness of Safe Street	Pearson Correlation Sig (2-tailed) N	-0.269** 0.007 100	0.879** 0.000 100	1 100

Correlation analysis further revealed that awareness of women-specific zones was strongly correlated with awareness of smart safety corridors, with a correlation coefficient of 0.879, indicating a strong relationship between the two. Residents who were aware of one were more likely to be aware of the other. This suggests that when gender-focused urban designs are communicated effectively, they are noticed, appreciated, and understood, particularly by women (see Table 12).

Table XII Summary of Results

Stage	Findings
Planning Stage	-Gendered considerations were incorporated into early planning; however, many principles were disregarded during implementation, leading to a lack of synergy in women-friendly initiatives. -Women-specific zones and smart safety street proposals were included, but collaboration issues between agencies (local government, educational institutions) led to non-implementation of key proposals. -Limited involvement of female residents during the planning phase resulted in missed opportunities for input in the development of smart city features and community infrastructure.
Implementation Stage	-A lack of cooperation between construction agencies and local governments hindered the realisation of women-friendly city concepts. -Unrealised proposals, such as after-school care initiatives in schools, due to administrative barriers and security concerns. -Women-friendly city elements such as pedestrian paths, street lighting, and community spaces were applied in Subang Jaya as a whole, but specific differentiation for women's needs was not implemented at the district level. -Integration problems resulted in a lack of communication across key actors in the project regarding operational challenges and follow-through on women-specific plans.

In conclusion, the findings highlight that while Subang Jaya is making progress in improving urban walkability and safety across genders, there is still a pressing need to institutionalise Post-Occupancy Evaluations, enhance community outreach, and integrate gender-specific considerations more clearly in signage, branding, and feedback mechanisms. Empowering communities—especially women—to participate meaningfully in both evaluation and planning processes is essential for Subang Jaya to truly evolve into a model women-friendly city.

DISCUSSION

Women-friendly cities aim to integrate gender-sensitive perspectives into urban planning and policies that have traditionally been male-centred. This approach challenges urban planning practices that have historically included men in the public domain and relegated women to the private sphere. Traditionally, housework and caregiving roles have been assigned to women, but with the increasing number of working women, criticism

has grown regarding the failure of urban planning to reflect the changing status and needs of women. Specifically, much attention has been paid to the constraints that women face because of their domestic roles, particularly focusing on their space-time movement patterns (Rose, 1993).

In Subang Jaya, Women-Friendly City was found to offer a relatively gender-equal and safe pedestrian environment. This was achieved through women-friendly space planning and the installation of smart solutions such as emergency bells for crime prevention. Both men and women recognised the area as a safe walking environment, but women were significantly more aware of crime prevention features, such as emergency bells, than men. This highlights the need for gender-sensitive urban planning that considers the differences in perceptions of safety.

Interviews with experts revealed the following key issues.

i. Cooperation gaps: There was minimal collaboration between women -friendly city planners and urban planners in both planning and operational phases. Administrative silos and the lack of mutual understanding between different sectors have hindered the effectiveness of integrated operations.
ii. Gender-neutral smart solutions: While gender-sensitive guidelines were partly incorporated into the planning of smart city initiatives, no differentiated solutions were provided for women-specific zones. Smart solutions such as CCTV, integrated urban information centres, safety apps, and emergency bells were implemented uniformly across Subang Jaya, rather than being tailored to address women's unique needs.
iii. Awareness gaps: Many residents in Subang Jaya are unaware that the city has been designated as a Women-Friendly City. This lack of awareness limits public engagement and reduces the effectiveness of targeted interventions aimed at enhancing safety and inclusivity.
iv. The policy implications of these findings can be divided into three stages:

Planning Stage

i. Establish institutionalised communication between women-friendly city experts and urban planners. The lack of coordination and communication between these sectors has impeded their effective integration. To allow for better cooperation, authorities must ensure that clear responsibilities and boundaries are established for each participating entity during the planning process.
ii. Integrating gendered data into urban planning. Currently, gender-neutral data from transportation and pedestrian activity surveys makes it difficult to address gender-specific needs. Women's movement patterns, caregiving burdens, and fear of crime should be considered when designing urban spaces.
iii. Increase user input through Post-Occupancy Evaluations (POE): Although planning for entirely new cities such as Subang Jaya can limit community input, feedback through POEs in existing areas provides valuable insights for more gender-sensitive urban planning. Collecting user input is essential to avoid a one-size-fits-all approach when planning facilities and public spaces.

Implementation Stage

Embedded gender mainstreaming principles in the implementation process. Subang Jaya 's Women-Friendly City was intended to be a 'one-stop' location for facilities such as schools, shops, and bus stations. However, because of poor coordination, this concept was not fully realised during the implementation phase. To avoid such issues, gender mainstreaming must be part of the implementation and not just in the planning stage. Smart city features must be gender-responsive and incorporated into the operational phases to meet the needs of all residents.

Post-Occupancy Evaluation Stage

i. Increased efforts to gather data on the everyday experiences of Subang Jaya residents. Gathering information on personal experiences will enable planners to better understand how gender influences daily life in urban spaces. Gendered data should be collected consistently because current data collection methods in Subang Jaya, as in many other cities, do not disaggregate information by gender. This hampers their ability to create gender-sensitive plans.
ii. Ensure that women actively participate in the planning process. Historically, women's participation in

urban planning in Subang Jaya and in other areas has been limited. The introduction of gender-sensitive planning principles encourage active female participation in decision making. Given that urban policies impact women and men differently, gender mainstreaming at the policy level is crucial for achieving gender equality in urban spaces. However, this study suggests that greater integration of gender-sensitive principles is needed across the planning, implementation, and post-occupancy evaluation stages to create truly inclusive cities.

Further studies are needed to identify specific factors that contribute to gender differences in urban settings. Future research should explore how to create a gender-safe walking environment with tailored smart solutions and consider the needs of other vulnerable groups such as children and the elderly. While this study focuses on Subang Jaya, its findings offer valuable insights into creating a more inclusive and gender-sensitive, women-friendly city. Despite its limitations, focusing on a single district and survey respondents, this study contributes significantly to understanding how gender-sensitive planning can improve urban environments for all residents.

Ethical Compliance

All procedures performed in studies involving human participants were conducted in accordance with the ethical standards of Universiti Teknikal Malaysia Melaka (UTeM) and the Centre for Research and Innovation Management (CRIM), UTeM.

Conflict Of Interest Declaration

The authors declare that they have no affiliations with or involvement in any organization or entity with any financial interest or non-financial interest in the subject matter or materials discussed in this manuscript.

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REFERENCES

1. Anttiroiko, A.-V., & de Jong, M. (2020b). Smart city governance: From e-government to urban e-governance. Springer.
2. Andrews, D., Criscuolo, C., & Gal, P. N. (2021). The best versus the rest: The global productivity slowdown, divergence across firms and the role of public policy. OECD Productivity Working Papers. https://doi.org/10.1787/5jrs3sbcrvzx-en
3. ASEAN. (2017). ASEAN Declaration on the Gender-Responsive Implementation of the ASEAN Community Vision 2025. ASEAN Secretariat.
4. ASEAN Secretariat. (2020). ASEAN Sustainable Urbanisation Strategy (ASUS). ASEAN Secretariat.
5. Asian Development Bank. (2022). Creating livable and inclusive cities in Asia. Asian Development Bank. https://www.adb.org/publications/creating-livable-and-inclusive-cities-asia
6. Bansal, G., Hanna, A., Lasecki, W. S., & Binns, R. (2023). Bias in AI and digital governance: Addressing overlooked dimensions. Journal of AI Ethics, 4(1), 45–60.
7. Bamwesigye, D., and Hlavackova, P. (2019). Analysis of sustainable transport for smart cities. Sustainability 11:2140. doi: 10.3390/su11072140
8. Barnes, M. (2021). Gender-sensitive urban planning: Strategies for safer cities. Urban Studies, 58(4), 733–750.
9. Beebeejaun, Y. (2017). Gender, urban space, and the right to everyday life. Journal of Urban Affairs, 39(3), 323–334. https://doi.org/10.1080/07352166.2016.1255526
10. Berrone, P., & Joan, E.-R. (2022). Cities and the inclusive growth agenda: A roadmap for practitioners.

IESE Business School.
11. Bilodeau, A., White, S., & Nevitte, N. (2020). Citizenship, political engagement, and belonging: Immigrants in Canada. University of Toronto Press.
12. Blumen, O. (1994). Gendered spaces: The social and spatial relations of the sexes. Urban Geography, 15(1), 1–11. https://doi.org/10.2747/0272-3638.15.1.1
13. Bondi, L. (1998). Gender, class, and urban space: Public and private space in contemporary urban landscapes. Urban Geography, 19(2), 160–185. https://doi.org/10.2747/0272-3638.19.2.160
14. Booth, C., & Bennett, C. (2002). Gender mainstreaming in the European Union: Towards a new conception and practice of equal opportunities? European Journal of Women's Studies, 9(4), 430–446. https://doi.org/10.1177/1350506802009004030l
15. Campisi, T., Akgün, N., Nikiforiadis, A., & Tesoriere, G. (2022). Women and urban mobility: Perspectives from European cities. Transportation Research Procedia, 60, 89–96.
16. Carrasco, C. (2019). The city and the gender division of labor. Urban Studies, 56(10), 2025–2040. https://doi.org/10.1177/0042098018789050
17. Cengiz, R., Soytemel, E., & Öztürk, S. (2022). Women-Friendly Cities Joint Programme: Institutional mechanisms for gender-sensitive urban development. Gender, Place & Culture, 29(5), 648–666. https://doi.org/10.1080/0966369X.2022.2040127
18. Chan, J. H., & Chye, L. H. (2023). Smart nation strategies in Singapore: Gender perspectives in urban technology adoption. Journal of Smart Cities and Urban Innovation, 4(2), 145–160. https://doi.org/10.1016/j.sciu.2023.04.007
19. Cities Alliance. (2020). Women and the city: How gender equality can transform cities for all. Cities Alliance. https://www.citiesalliance.org/resources/publications/cities-alliance-knowledge/women-and-city
20. Čolić Marković, J., & Danilović Hristić, N. (2025). Participatory urban planning: Gender-responsive approaches for inclusive city spaces. Journal of Urban and Regional Planning, 11(1), 22–39.
21. Dalu, M. T. B., & Manyani, A. (2020). Mainstreaming gender in urban planning for inclusive cities. Journal of Planning Literature, 35(3), 299–313.
22. Daly, M. (2005). Gender mainstreaming in theory and practice. Social Politics: International Studies in Gender, State & Society, 12(3), 433–450. https://doi.org/10.1093/sp/jxi023
23. Datta, A. (2021). Gender, urban spaces and gendered resistances: towards inclusive and fear free cities in India. Reflections on 21st Century Human Habitats in India: Felicitation Volume in Honour of Professor MH Qureshi. 327–43. doi: 10.1007/978-981-16-3100-9_13
24. Datta, A. (2022). Gendering the smart city: From surveillance to inclusion. Urban Geography, 43(1), 88–109.
25. de Madariaga, I. S. (2004). Urban planning and gender equality: The role of gender in shaping the city. Gender, Place & Culture, 11(3), 289–302. https://doi.org/10.1080/0966369042000258660
26. de Madariaga, I. S., & Neuman, M. (2020). Engendering cities: Designing sustainable urban spaces for all. Routledge.
27. Dymén, C., & Ceccato, V. (2012). Gendered mobility and the spatiality of fear: A study of women's fear in public spaces in Sweden. Urban Studies, 49(13), 2881–2899. https://doi.org/10.1177/0042098012439112
28. Economic Planning Unit. (2021). Twelfth Malaysia Plan, 2021–2025: A prosperous, inclusive, sustainable Malaysia. Prime Minister's Department, Malaysia.
29. Elias, J. (2020). Gender, security, and climate change: Observing global discourses through a feminist lens. International Feminist Journal of Politics, 22(3), 366–372. https://doi.org/10.1080/14616742.2019.1664928
30. Esra Banu Sipahi, & Erhan Örselli. (2019). The women-friendly city approach and an evaluation of Eskişehir, Turkey. Megaron, 14(1), 52–63. https://doi.org/10.5505/megaron.2019.40630
31. Fedorenko, I., & Kolos, A. (2023). Smart transport solutions for women's safety: Lessons from Dubai. International Journal of Urban Sciences, 27(2), 225–240.
32. Feng, Y., Wang, S., & Yang, S. (2023). Urban sustainability and the role of SDG 11: A critical review. Sustainability, 15(3), 1156.
33. Fenster, T. (2005). The right to the gendered city: Different formations of belonging in everyday life. Journal of Gender Studies, 14(3), 217–231. https://doi.org/10.1080/09589230500264109

34. German, S., Metternicht, G., Laffan, S., and Hawken, S. (2023). Intelligent spatial technologies for gender inclusive urban environments in today's smart cities. Intellig. Environm. 2023, 285–322. doi: 10.1016/B978-0-12-820247-0.00012-6
35. Gilbert, A. (1997). The new urban economy: A review of the literature. Urban Studies, 34(5–6), 953–970. https://doi.org/10.1080/0042098975853
36. Greed, C., & Reeves, D. (2005). Mainstreaming equality into strategic spatial policy making: Are town planners losing sight of gender? Town Planning Review, 76(3), 267–288. https://doi.org/10.3828/tpr.76.3.3
37. Gendered Innovations Initiative. (2020). Gendered innovations in science, health & medicine, engineering, and environment. Stanford University. https://genderedinnovations.stanford.edu/
38. Gül, Z., Demirtaş-Milz, N., & Arslan, M. (2023). Rethinking gender and space in urban infrastructure: A feminist critique of inclusive planning. Urban Studies Review, 60(3), 401–420. https://doi.org/10.1177/00420980221103778
39. Gutiérrez Mozo, M. E. (2020). Gender, safety, and urban spaces: A global analysis. Urban Design International, 25(2), 80–95.
40. Hanson, S. (2023). Feminist geography and the challenge to androcentric urban planning. Gender, Place & Culture, 30(1), 1–15.
41. Harvey, D. (1996). Justice, nature and the geography of difference. Blackwell.
42. Hayden, D. (1980). What would a non-sexist city be like? Speculations on housing, urban design, and human work. Signs, 5(3), S170–S187. https://doi.org/10.1086/495718
43. Hernes, H. M. (1987). Welfare state and woman power: Essays in state feminism. Norwegian University Press.
44. Itair, M., Shahrour, I., and Hijazi, I. (2023). The use of the smart technology for creating an inclusive urban public space. Smart Cities. 6, 2484–98. doi: 10.3390/smartcities6050112
45. Kiper, P., İlhan, A., & Kiper, G. (2016). Gender-responsive urban planning for safer public spaces: A case study of Ankara. Urban Planning International, 31(3), 89–96.
46. KWDI (Korean Women's Development Institute). (2010). Policy measures for the promotion of women-friendly cities. KWDI.
47. Kusumastuti, R., Wibowo, A., & Gunawan, Y. (2022). Building urban resilience through smart city initiatives in Indonesia: The case of Tangerang City. International Journal of Disaster Risk Reduction, 71, 102802. https://doi.org/10.1016/j.ijdrr.2022.102802
48. Kyttä, M., Broberg, A., & Tuominen, P. (2022). Everyday mobility and spatial needs: A gendered perspective on inclusive city planning. Journal of Transport Geography, 102, 103356. https://doi.org/10.1016/j.jtrangeo.2022.103356
49. Leal Maldonado, J. (2002). Urban restructuring and changing patterns of socio-economic segregation in Madrid. In Inequality and rising levels of socio-economic segregation (pp. 214–237). Amsterdam University Press.
50. Leal, J., & Sorando, D. (2015). Economic crisis, social change and segregation processes in Madrid. In Inequality and rising levels of socio-economic segregation (pp. 214–237). Amsterdam University Press.
51. Liang, X., Lu, Y., Yang, R., & Wu, W. (2022). Inclusive cities: A conceptual framework and empirical analysis. Cities, 125, 103582. https://doi.org/10.1016/j.cities.2022.103582
52. Liang, X., Shen, J., & Liu, H. (2022). Inclusive cities: Concept, measurement, and implications for urban governance. Cities, 129, 103839. https://doi.org/10.1016/j.cities.2022.103839
53. Lindkvist, C. (2024). Gendered mobility strategies and challenges to sustainable travel—patriarchal norms controlling women's everyday transportation. Front. Sustain.Cities 6:1367238. doi: 10.3389/frsc.2024.1367238
54. Listerborn, C. (2007). Who speaks? And who listens? The relationship between planners and women's participation in local planning in a multi-cultural urban environment. GeoJournal, 70(1), 61–74. https://doi.org/10.1007/s10708-007-9114-8
55. Lombardo, E., Meier, P., & Verloo, M. (2017). Policymaking from a gender+ equality perspective. Journal of Women, Politics & Policy, 38(1), 1–19. https://doi.org/10.1080/1554477X.2016.1198207
56. Manzoor, M. A., Hassan, S. U., Muazzam, A., Tuarob, S., and Nawaz, R. (2023). Social mining for sustainable cities: thematic study of gender-based violence coverage in news articles and domestic violence in relation to COVID-19. J. Ambient Intell. Humaniz. Comput. 14, 14631–42. doi:

10.1007/s12652-021-03401-8
57. Meysam Zekavat, & Arezoo Momenian. (2018). Gender justice in urban spaces: Women's experiences in Iranian cities. Journal of Urban Management, 7(1), 40–50. https://doi.org/10.1016/j.jum.2018.02.002
58. MBSJ. (2022). Subang Jaya: Malaysia's first women-friendly city initiative. Majlis Bandaraya Subang Jaya Official Report.
59. McDowell, L. (1983). Towards an understanding of the gender division of urban space. Environment and Planning D: Society and Space, 1(1), 59–72. https://doi.org/10.1068/d010059
60. McDowell, L. (2000). Gender, identity and place: Understanding feminist geographies. Polity Press.
61. Meena, M. S., & Singh, K. M. (2010). Inclusive urban development: Concept and indicators. Indian Journal of Social Development, 10(1), 19–30.
62. Ministry of Women, Family, and Community Development. (2019). National Policy on Women 2009. Government of Malaysia.
63. Morrow, O. (2018). Designing urban spaces for women's empowerment: Participatory approaches. Cities, 76, 1–8.
64. Mostofi, H. (2022). The frequency use and the modal shift to ICT-based mobility services. Resources, Environm. Sustainab. 9:100076. doi: 10.1016/j.resenv.2022.10
65. Ngulube, T., Banda, L., & Mbewe, S. (2024). Gender equality and economic transformation: A case study of Lusaka. Journal of African Urban Studies, 6(1), 23–38.
66. Orozco, A. (2014). The sexual division of labor and the urban space: A feminist perspective. Gender, Place & Culture, 21(7), 857–874. https://doi.org/10.1080/0966369X.2013.810601
67. Otero-Hermida, P., & Lorenzo, A. A. (2020). Mainstreaming gender in public policies: Transformations, limits, and difficulties. Gender, Place & Culture, 27(9), 1259–1277. https://doi.org/10.1080/0966369X.2019.1681363
68. Owais, S., Yuliani, N., & Hakim, A. (2024). Evaluating multimodal public transportation from a gender lens: The case of Jakarta. Transportation and Gender Equity Journal, 2(1), 55–70.
69. Othman, A., AlMutawaa, A., Al Tamimi, A., and AlMansouri,M. (2023). Assessing the readiness of government and semi-government institutions in qatar for inclusive and sustainable ICT accessibility: introducing the MARSAD tool. Sustainability 15:3853. doi: 10.3390/su15043853
70. Oudshoorn, N., Rommes, E., & Stienstra, M. (2004). Configuring the user as everybody: Gender and design cultures in information and communication technologies. Science, Technology, & Human Values, 29(1), 30–63. https://doi.org/10.1177/0162243903259190
71. Pain, R. (2001). Gender, race, age and fear in the city. Urban Studies, 38(5–6), 899–913. https://doi.org/10.1080/00420980120046590
72. Pirra, M., Kalakou, S., Carboni, A., Costa, M., Diana, M., Lynce, A. R. A., et al. (2021). preliminary analysis on gender aspects in transport systems and mobility services: Presentation of a survey design. Sustainability 13:2676. doi: 10.3390/su13052676
73. Pollack, M. A., & Hafner-Burton, E. (2000). Mainstreaming gender in the European Union. Journal of European Public Policy, 7(3), 432–456. https://doi.org/10.1080/13501760050086116
74. Rampaul, C., & Magidimisha-Chipungu, S. S. (2022). Safe cities for women: A gender perspective in urban design. International Planning Studies, 27(2), 156–172.
75. Rauf, M. A., Amin, R., & Afzal, M. (2023). Sustainable urban development and the integration of SDGs: Policy implications for smart cities. Journal of Urban Management, 12(1), 67–78.
76. Rees, T. (2005). Reflections on the uneven development of gender mainstreaming in Europe. International Feminist Journal of Politics, 7(4), 555–574. https://doi.org/10.1080/14616740500284532
77. Robin, E. (2014). The urban politics of climate change: Policy and planning in global cities. Geography Compass, 8(3), 145–158. https://doi.org/10.1111/gec3.12118
78. Roberts, M. (2023). Reclaiming urban space: Women's safety and inclusive smart city initiatives in Europe. Urban Futures, 18(3), 201–217.
79. Rose, G. (1993). Feminism and geography: The limits of geographical knowledge. University of Minnesota Press.
80. Rossi, U., & Vanolo, A. (2010). Urban political geographies: A global perspective. Sage Massey, D. (1994). Space, place, and gender. University of Minnesota Press.
81. Saad, S., Zulkifli, N., & Hassan, H. (2024). Gender-related barriers to effective public participation in land use planning: A study in Perlis, Malaysia. Journal of Planning and Development, 20(1), 45–58.

82. Sánchez de Madariaga, I., & Neuman, M. (2021). Engendering cities: Planning for equity. Routledge.
83. Sayer, A. (2005). The moral significance of class. Cambridge University Press.
84. Selangor State Government. (2020). Women Empowerment Agenda (2020–2025). Selangor State Government.
85. Schiebinger, L. (2019). Gendered innovations: How inclusive analysis contributes to research and innovation. European Commission. https://ec.europa.eu/research/swafs/pdf/pub_gender_equality/gendered_innovations.pdf
86. Soja, E. W. (2000). Postmetropolis: Critical studies of cities and regions. Blackwell.
87. Soja, E. W. (2010). Seeking spatial justice. University of Minnesota Press.
88. Swyngedouw, E., Kaika, M., & Castro, J. E. (2002). Urban water: A political-ecology perspective. Built Environment, 28(2), 124–137. https://doi.org/10.2148/benv.28.2.124.14765
89. Taewook, K. (2015). Women-friendly cities for sustainable development: A study of Korean practices. Journal of Urban and Regional Analysis, 7(2), 123–137.
90. Tayeng, D., Sharma, P., & Bhargava, A. (2024). Smart city governance and gendered participation: Insights from Pune, India. Asian Urban Governance Review, 9(1), 44–61.
91. Terraza, H., Orlando, M. B., Lakovits, C., Janik, V. L., and Kalashyan, A. (2020). Handbook for Gender-Inclusive Urban Planning and Design. Washington, DC: World Bank.
92. Tierney, A. (2019). Smart city strategy in Toronto: Gender inclusion through urban data and civic engagement. Journal of Urban Affairs, 41(5), 629–648. https://doi.org/10.1080/07352166.2018.1511799
93. Tokman, V. E. (2009). Advancing women's participation in urban governance through women-friendly city initiatives. UNESCO International Social Science Journal, 60(195), 269–282. https://doi.org/10.1111/j.1468-2451.2009.01709.x
94. UN. (2015). Transforming our world: The 2030 agenda for sustainable development. United Nations. https://sdgs.un.org/2030agenda
95. UN-Habitat. (2020). Gender equality in urban development: Current trends and perspectives. United Nations Human Settlements Programme.
96. UN Women. (2023). Women-friendly cities in Southeast Asia: Progress and prospects. United Nations Entity for Gender Equality and the Empowerment of Women.
97. UN-Habitat. (2016). World cities report 2016: Urbanization and development – Emerging futures. United Nations Human Settlements Programme (UN-Habitat). https://unhabitat.org/world-cities-report
98. UN-Habitat. (2016). New Urban Agenda. United Nations Human Settlements Programme. https://habitat3.org/the-new-urban-agenda/
99. UN-Habitat. (1996). Women's lives in urban places: UN-Habitat II. United Nations Centre for Human Settlements.
100. Urban Development Vienna. (2021). Gender mainstreaming in urban planning: The Vienna model. City of Vienna.
101. USAID. (2017). ADS Chapter 205: Integrating gender equality and female empowerment in USAID's program cycle. U.S. Agency for International Development. https://www.usaid.gov/sites/default/files/documents/1870/205.pdf
102. Uteng, P., and Susilo, Y. (2021). Women and transport modes. Int. Encyclop. Transpor. doi: 10.1016/b978-0-08-102671-7.10600-1
103. Vaidya, C., & Chatterji, T. (2020). Urban governance and the sustainable development goals: A gendered perspective. Environment and Urbanization ASIA, 11(1), 1–16.
104. Valentine, G. (1989). The geography of women's fear. Area, 21(4), 385–390.
105. Veloso, E., Martin, S., & Alvarez, M. (2024). Inclusive design in smart cities: Gender-responsive infrastructure in Amsterdam and Barcelona. Journal of Urban Innovation and Equity, 5(1), 88–104.
106. Verloo, M. (2005). Mainstreaming gender equality in Europe. A critical frame analysis approach. The Greek Review of Social Research, 117, 11–34. https://doi.org/10.12681/grsr.9334
107. Wacquant, L. (2008). Urban outcasts: A comparative sociology of advanced marginality. Polity Press.
108. Wajcman, J. (2023). The gender politics of smart cities. Information, Communication & Society, 26(1), 36–52.
109. Walby, S. (2005). Gender mainstreaming: Productive tensions in theory and practice. Social Politics: International Studies in Gender, State & Society, 12(3), 321–343. https://doi.org/10.1093/sp/jxi018

110. World Bank. (2015a). Inclusive cities approach paper. The World Bank Group. https://documents.worldbank.org/en/publication/documents-reports/documentdetail/402451468169453117/inclusive-cities-approach-paper
111. World Bank. (2015a). Stocktaking of the housing sector in Sub-Saharan Africa: Challenges and opportunities. World Bank.
112. World Bank. (2015b). Inclusion matters: The foundation for shared prosperity. World Bank. https://openknowledge.worldbank.org/handle/10986/16195
113. Yadav, S., & Kumari, P. (2021). Urban planning and women's safety: A comparative study. Journal of Urban Studies Research, 2021, 1–10.
114. Young, A.W. (2024). Get Thee to a Smart City: a Study on Queer Urban Planning in Seestadt Aspern. Central European University. Available at: https://www.etd.ceu.edu/ 2024/young_alina.pdf
115. Young, K. (2024). Mainstreaming gender in urban development: Lessons from Vienna. Cities and Gender Policy Review, 7(2), 101–119.