Women's Mobility and Public Space Utilization in Prayagraj: A Behavioural Study of Safety Concerns and Urban Planning

SCHOOL OF ARCHITECTURE & PLANNING, BABU BANARASI DAS UNIVERSITY FAIZABAD ROAD, LUCKNOW, U.P-226028

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Thesis Submitted in Partial Fulfillment of the requirements for the award of the degree of

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DECLARATION

I, **Harshita Singh (1230152009),** hereby declare that this thesis titled **'Women's Mobility and Public Space Utilization in Prayagraj: A Behavioral Study of Safety Concerns and Urban Planning'** submitted by me, in partial fulfilment of the requirements for the award of the degree **Master of Planning (with specialization in Urban Planning)**, by the School of Architecture and Planning, Babu Banarasi Das University, Lucknow is are cord of my work. The matter embodied in this thesis is original and has not been copied, either in part or in full, or submitted to any other institution for the award of any degree or diploma. Wherever data, in full in part, has been borrowed for this thesis, the Author/soft the same has been duly acknowledged.

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EXECUTIVE SUMMARY

This comprehensive study examines women's mobility patterns and public space utilization in Prayagraj, Uttar Pradesh, through the lens of safety concerns and urban planning challenges. Employing a mixed-methods approach involving surveys, interviews, spatial mapping, and behavioral observations across four distinct urban zones, the research reveals significant disparities between intended public space design and actual usage patterns among women.

Comparative analysis with international best practices from Umeå, Sweden and Vienna, Austria, alongside national examples from Mumbai and Kochi, provides a framework for developing context-appropriate interventions. The research proposes a comprehensive implementation strategy spanning immediate safety improvements to long-term urban planning reforms, positioning Prayagraj as a potential model for heritage cities implementing gender-responsive planning.

Key contributions include the development of a behavioral analysis framework for women's urban mobility, identification of specific infrastructure and policy gaps, and creation of an evidence-based roadmap for inclusive urban development. The findings have implications for urban planners, policymakers, and community organizations working toward creating safer, more accessible cities for all residents.

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UNDERTAKING

I, Ms. Harshita Singh, the author of the thesis titled "**Women's Mobility and Public Space Utilization in Prayagraj: A Behavioral Study of Safety Concerns and Urban Planning**", hereby declare that this is an independent work of mine, carried out towards fulfilment of the requirements for the award of the Masters in Urban Planning at the Department of Architecture and Planning, BBDU, Lucknow. The work has not been submitted to any other organization / institution for the award of any Degree/Diploma.

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Abstract

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The study finds that 67% of women in Prayagraj experience mobility restrictions related to safety concerns, with 84% avoiding solo travel after 7 PM. Through detailed studies, the research demonstrates how different urban morphologies present unique challenges and opportunities for women's safe mobility.

Comparative analysis with international best practices from Umeå, Sweden and Vienna, Austria, alongside national examples from Mumbai and Kochi, provides a framework for developing context-appropriate interventions. The research proposes a comprehensive implementation strategy spanning immediate safety improvements to long-term urban planning reforms, positioning Prayagraj as a potential model for heritage cities implementing gender-responsive planning.

Key contributions include the development of a behavioral analysis framework for women's urban mobility, identification of specific infrastructure and policy gaps, and creation of an evidence-based roadmap for inclusive urban development. The findings have implications for urban planners, policymakers, and community organizations working toward creating safer, more accessible cities for all residents.

1: Introduction

1.1 Background and Context

Urban spaces in India are experiencing unprecedented growth and transformation, with over 377 million people currently residing in cities and towns. This rapid urbanization brings both opportunities and challenges, particularly for women who constitute nearly half of the urban population yet face significant barriers in accessing and utilizing public spaces safely and independently.

Prayagraj, formerly known as Allahabad, stands as one of India's most historically significant cities, located at the confluence of the Ganges, Yamuna, and mythical Saraswati rivers. With a metropolitan population exceeding 1.2 million, the city serves as a major administrative, educational, and cultural center in Uttar Pradesh. The city's unique position as both a heritage site and a growing urban center presents distinctive challenges and opportunities for inclusive urban development.

The question of women's mobility and safety in public spaces has gained increasing attention in Indian urban discourse, particularly following high-profile incidents that highlighted systemic issues in urban design and governance. However, much of the research has focused on metropolitan cities like Delhi, Mumbai, and Bangalore, leaving significant knowledge gaps regarding women's experiences in mid-tier cities like Prayagraj.

Women's relationship with urban spaces is complex and multifaceted, influenced by factors ranging from infrastructure design and safety perceptions to social norms and economic opportunities. In the Indian context, this relationship is further complicated by cultural considerations, varying levels of infrastructure development, and diverse socio-economic conditions across different urban areas.

The concept of "right to the city," originally articulated by Henri Lefebvre, takes on particular significance when examined through a gender lens. Women's right to access occupy, and move freely through urban spaces remains contested and constrained in many Indian cities. Understanding these constraints and their underlying causes is essential for creating truly inclusive urban environments.

1.2 Problem Statement

Despite significant investments in urban infrastructure and development programs, women in many Indian cities continue to face substantial barriers in accessing and utilizing public spaces. These barriers manifest in various forms: temporal restrictions on movement, spatial avoidance of certain areas, modified travel routes, and reliance on male accompaniment or private transport even for short distances.

In Prayagraj, preliminary observations and anecdotal evidence suggest that women's mobility patterns are significantly influenced by safety concerns, inadequate infrastructure, and social factors. However, systematic research examining these patterns, their underlying causes, and their broader implications for urban planning and development remains limited.

The problem extends beyond individual safety concerns to encompass broader issues of urban inequality, economic participation, and social justice. When women cannot move freely and safely through urban spaces, their access to employment, education, healthcare, and social opportunities becomes constrained, perpetuating gender-based inequalities and limiting the city's overall social and economic potential.

Current urban planning approaches in Prayagraj, like many Indian cities, have historically adopted gender-neutral perspectives that fail to account for differential experiences of urban spaces. This approach results in infrastructure and policies that may inadvertently exclude or marginalize women users, creating environments that work better for some residents than others.

The challenge is compounded by the intersection of multiple factors: rapid urban growth, resource constraints, cultural sensitivities, and the need to balance heritage preservation with modern development requirements. Understanding how these factors interact to influence women's urban experiences is crucial for developing effective, sustainable solutions.

1.3 Significance of the Study

This research addresses several critical gaps in current understanding of gender and urban planning in India while providing practical insights for improving women's urban experiences. The significance extends across academic, policy, and practical dimensions.

Academic Significance:

Current research on women's urban mobility in India has predominantly focused on metropolitan cities, with limited attention to mid-tier cities that house a significant portion of India's urban population. This study contributes to filling this gap by providing detailed insights into women's experiences in a city like Prayagraj, which shares characteristics with numerous other mid-tier Indian cities.

The research also contributes methodologically by demonstrating how mixed-methods approaches can be effectively employed to capture the complexity of gendered urban experiences. The combination of quantitative surveys, qualitative interviews, spatial mapping, and behavioral observations provides a comprehensive analytical framework that can be replicated in other contexts.

Policy Significance:

The findings have direct relevance for urban planning policies and programs at multiple levels. At the local level, the research provides specific, actionable recommendations for improving infrastructure, services, and governance in Prayagraj. These insights can inform ongoing development projects, including Smart Cities Mission initiatives and urban renewal programs.

At the state and national levels, the research contributes to broader policy discussions about inclusive urban development, women's safety, and gender-responsive planning. The findings can inform the development of guidelines, standards, and frameworks for incorporating gender considerations into urban planning processes.

Practical Significance:

Beyond academic and policy contributions, this research has immediate practical implications for various stakeholders. Urban planners, architects, and designers can use the findings to create more inclusive public spaces and infrastructure. Community organizations and women's groups can leverage the research to advocate for improvements and hold authorities accountable.

The participatory methods employed in the research also demonstrate how communities can be engaged as partners in identifying problems and developing solutions, providing a model for ongoing community-based monitoring and improvement efforts.

Social Significance:

At its core, this research is about social justice and the right to the city. By documenting and analyzing women's constrained urban experiences, the study contributes to broader efforts to create more equitable, inclusive cities. The research highlights how urban planning decisions have differential impacts on different groups, emphasizing the need for more careful attention to equity and inclusion in development processes.

2. Conceptual Framework

2.1 Aim

The study aims to analyze women's mobility patterns, safety concerns, and the impact of urban planning in Prayagraj, to form gender-inclusive policies and infrastructure improvements for safer public spaces.

2.2 Objectives

- To analyze women's mobility patterns and their interaction with public spaces in Prayagraj, identifying key challenges related to accessibility and safety.
- To assess the role of urban infrastructure, including transportation, lighting, sanitation, and pedestrian pathways, in shaping women's freedom of movement.
- To examine the impact of socio-cultural norms, gender dynamics, and evolving safety concerns on women's ability to navigate urban spaces independently.
- To evaluate existing urban planning policies and interventions in Prayagraj from a gender-sensitive perspective, identifying gaps and areas for improvement.
- To propose inclusive urban planning strategies and policy recommendations aimed at enhancing women's safety, mobility, and equitable access to public spaces.

2.3 Research Questions

The study addresses the following key research questions:

1. What role do cultural norms and societal behaviours play in shaping women's mobility patterns in the city?
2. How does the existing urban infrastructure and planning in Prayagraj impact women's accessibility and security?
3. What urban planning strategies and policy interventions can enhance women's safety and mobility in Prayagraj?
4. How does density, social, economical of demography impact women's accessibility and security?

2.4 Scope of the Study

- **Geographical and Contextual Focus:** The study examines women's mobility, safety, and public space utilization in Prayagraj, considering everyday urban settings.
- **Changing Role of Women:** With increasing women's participation in education, employment, and public life, the study explores how urban spaces either facilitate or hinder their agency over mobility and autonomy.

- **Evolving Nature of Safety Concerns:** As women assert greater control over their lives and bodies, the nature of crimes and harassment they face has also evolved, shifting from traditional physical threats to more complex forms like stalking, digital harassment, and public shaming. The study assesses how urban planning can address these emerging challenges.

- **Stakeholder Engagement:** Perspectives from women commuters, urban planners, law enforcement, policymakers, and civil society groups will be integrated to understand diverse experiences and challenges.

- **Policy and Planning Recommendations:** The study aims to suggest gender-sensitive urban policies that not only enhance safety but also challenge deep-rooted structural barriers limiting women's mobility and autonomy in urban spaces.

2.5 Limitations

- **Data Constraints and Representation:** The study relies on government reports, surveys, and interviews, which may not fully capture the diverse experiences of women across different socio-economic, caste, and ability-based groups.

- **Evolving Nature of Safety Threats:** While the study examines women's safety concerns in public spaces, the rapidly changing patterns of crime, including digital harassment and social surveillance, may not be fully addressed and available within the available urban data.

- **Subjectivity in Perceptions of Safety:** Women's sense of security is shaped by individual experiences, cultural conditioning, and social expectations, making it challenging to generalize findings across different groups.

- **Implementation Challenges**: Even if the study provides strong policy recommendations, their effectiveness depends on government priorities, political will, funding availability, and the responsiveness of urban governance structures.

2.6 Methodology

2.6.1 Study Design and Approach

This research employs a mixed-methods approach that combines quantitative and qualitative research techniques to provide comprehensive understanding of women's mobility and public space utilization in Prayagraj. The study design is informed by feminist research principles that emphasize participatory methods, attention to power relations, and the validation of women's experiential knowledge.

The research adopts a pragmatic philosophical approach that prioritizes practical problem-solving and real-world applications over abstract theoretical debates. This approach is particularly appropriate for applied research in urban planning, where the goal is to develop actionable insights that can improve women's urban experiences.

Sequential Explanatory Design:

The study follows a sequential explanatory design where quantitative data collection and analysis is followed by qualitative research to explain and contextualize quantitative findings. This approach allows for broad patterns to be identified through survey research while providing in-depth understanding of underlying causes and experiences through interviews and focus groups.

The sequential design also incorporates spatial analysis and behavioral observation as intermediate steps that bridge quantitative and qualitative components. This multi-phase approach ensures that findings are both statistically robust and contextually rich.

Participatory Action Research Elements:

While primarily an academic research study, the methodology incorporates participatory action research elements that engage women as partners in identifying problems, analyzing causes, and developing solutions. This includes participatory mapping exercises, community workshops, and collaborative analysis sessions.

The participatory elements serve multiple purposes: they improve the quality and relevance of data, build local capacity for ongoing advocacy and monitoring, and ensure that research findings are accessible and useful to participants and their communities.

2.6.2 Data Collection Methods

The study employs multiple data collection methods to capture different dimensions of women's urban mobility experiences. Each method is designed to contribute specific types of information while also providing opportunities for triangulation and validation.

Quantitative Survey Research:

A structured questionnaire was administered to 450 women across different areas of Prayagraj to collect systematic data on mobility patterns, safety perceptions, infrastructure usage, and demographic characteristics. The survey was designed based on extensive literature review and preliminary fieldwork to ensure cultural appropriateness and relevance.

The survey includes multiple question types: closed-ended questions for demographic and behavioral data, Likert scale questions for attitude and perception measurements, and ranking questions for prioritizing concerns and solutions. The questionnaire was pre-tested with a small sample and revised based on feedback before full implementation.

Survey administration employed multiple methods to maximize participation and representation: face-to-face interviews in residential areas, workplace visits with permission from employers, and presence at public spaces such as markets and transport hubs. Trained female enumerators conducted all interviews to ensure comfort and safety for participants.

In-Depth Interviews:

Thirty-five semi-structured interviews were conducted with women representing diverse age groups, socio-economic backgrounds, and geographical areas within Prayagraj. Interview

participants were selected using purposive sampling to ensure representation of different perspectives and experiences.

Interview topics included personal mobility experiences, specific safety incidents or concerns, coping strategies, support systems, and suggestions for improvements. Interviews were conducted in Hindi or English based on participant preference and were audio-recorded with consent for later transcription and analysis.

Interview locations were chosen to ensure participant comfort and privacy, including participants' homes, workplaces, or neutral public spaces. Each interview lasted 45-90 minutes and was conducted by trained female researchers with experience in gender-sensitive interviewing techniques.

Focus Group Discussions:

Six focus group discussions were conducted with 6-8 participants each, organized around specific themes or demographic groups. Focus groups included working women, students, and elderly women, mothers with young children, women with disabilities, and women from low-income communities.

Focus groups employed participatory techniques including mapping exercises where participants identified safe and unsafe areas, timeline development showing how mobility patterns change over time, and problem-solving sessions where participants collectively developed recommendations for improvements.

Each focus group was facilitated by trained moderators using structured discussion guides while allowing for organic conversation development. Sessions were audio-recorded and supplemented with notes on group dynamics and non-verbal communication.

Behavioral Observations:

Systematic behavioral observations were conducted at selected public spaces to document actual usage patterns and identify discrepancies between reported and observed behavior. Observation sites included parks, markets, transport hubs, and street corners representing different urban environments.

Observations were conducted at different times of day and days of the week to capture temporal variations in space usage. Observers used structured protocols to record the number, demographics, and activities of space users while maintaining ethical standards regarding privacy and consent.

Observational data includes information about space usage density over time, gender composition of users, types of activities, apparent comfort levels, and interactions between different user groups. This data provides important context for interpreting survey and interview findings.

Spatial Mapping and Analysis:

Participatory mapping exercises engaged women in identifying safe and unsafe areas, preferred routes, avoided locations, and suggestions for improvements. These exercises used both digital and paper maps at different scales to capture neighborhood-level and city-wide patterns.

GPS tracking was employed with a subset of willing participants to document actual travel routes and compare them with reported preferences and concerns. This data provides objective information about route choice and travel patterns while respecting participant privacy and agency.

Geographic Information Systems (GIS) analysis integrated survey data, interview insights, and observational findings with spatial data on infrastructure, crime statistics, and urban morphology. This analysis identifies spatial patterns and relationships that inform targeted interventions.

Secondary Data Analysis:

The study incorporates analysis of relevant secondary data including crime statistics from local police stations, demographic data from census sources, transport usage statistics from municipal authorities, and planning documents from government agencies.

Crime data analysis focuses on incidents affecting women in public spaces, examining spatial and temporal patterns while recognizing limitations in reporting and recording practices. Transport data provides context for understanding mobility infrastructure and usage patterns.

Data Type	Sources	Method	Purpose
Primary Data	Women commuters, students, professionals, daily wage workers, policymakers, law enforcement	Surveys & Questionnaires (structured & semi-structured), Focus Group Discussions (FGDs), Interviews	To understand women's mobility patterns, safety concerns, and urban planning gaps
Secondary Data	Government reports, urban planning documents, crime records, academic studies, NGO reports	Document Analysis (Census data, NCRB reports, city development plans, transport policies)	To assess existing urban policies, crime trends, and infrastructure provisions
Spatial Data	City maps, GIS databases, urban development agencies	Spatial Mapping & Observation	To analyze accessibility, transport networks, street lighting, and high-risk zones
Behavioural Data	Women's movement patterns, preferred transport modes, safety precautions	Observations (at bus stops, markets, university areas, isolated streets)	To document real-time mobility constraints and adaptive behaviors
Event-based Data	Data on past public events (excluding Mahakumbh) impacting mobility	Case Study Analysis	To compare women's mobility patterns in both everyday and high-density public spaces

Table 2.1

3. Literature Study

3.1 Theoretical Framework

The study of women's mobility and public space utilization requires an interdisciplinary approach that draws from several theoretical frameworks and bodies of literature. This section reviews the key theoretical concepts, international experiences, and empirical studies that inform our understanding of gender, mobility, and urban planning.

3.1.1 Feminist Geography and Spatial Theory

Feminist geography has fundamentally challenged traditional approaches to understanding space and place by highlighting how spatial experiences are gendered. Doreen Massey's conceptualization of space as socially constructed and power-laden provides a foundation for understanding how women's experiences of urban space differ from men's. The concept of "gendered spaces" recognizes that spatial arrangements both reflect and reproduce gender relations and power structures.

Susan Hanson and Geraldine Pratt's groundbreaking work on gender, work, and space demonstrated how women's employment opportunities are constrained by their spatial mobility limitations. Their research revealed the complex relationships between residential location, transportation access, and labor market participation, highlighting how spatial constraints can perpetuate gender inequalities in economic participation.

The concept of "time-space constraints" developed by Torsten Hägerstrand and later applied to gender analysis by feminist geographers, provides a framework for understanding how women's daily activities are structured by temporal and spatial limitations. Women's responsibility for reproductive labor—childcare, eldercare, household management—creates complex time-space budgets that influence their mobility patterns and use of urban space.

3.1.2 Mobility Studies and Transportation Geography

The "new mobilities paradigm" proposed by John Urry and Mimi Sheller has expanded understanding of mobility beyond transportation to encompass the social, cultural, and political dimensions of movement. This approach recognizes that mobility is not just about physical movement but about access to opportunities, social networks, and urban resources.

Gender differences in mobility patterns have been well-documented in transportation literature. Women typically make more complex trip chains, combining multiple purposes in single journeys due to their greater responsibility for household and care work. They also demonstrate different modal preferences, often favoring walking, public transportation, and shared mobility options over private vehicle ownership.

The concept of "mobility justice" has emerged as a framework for understanding how transportation systems can either perpetuate or alleviate social inequalities. This perspective emphasizes the need to ensure that all community members have access to affordable, safe, and reliable transportation options that connect them to opportunities and services.

3.1.3 Safety and Security in Urban Spaces

Research on women's safety in urban spaces has identified multiple dimensions of security concerns. Physical safety encompasses both crime-related fears and traffic safety issues. Sexual harassment and violence in public spaces represent significant barriers to women's mobility, with studies showing that fear of harassment affects women's route choices, timing of trips, and use of public transportation.

The concept of "perceived safety" versus "actual safety" is crucial in understanding women's spatial behavior. Research has shown that women's fear of crime in public spaces often exceeds actual crime rates, but this perception nonetheless significantly influences their mobility decisions. Environmental factors such as lighting, visibility, maintenance, and the presence of other people all contribute to perceptions of safety.

Rachel Pain's work on fear of crime and its gendered dimensions demonstrates how safety concerns are not just individual psychological phenomena but are shaped by broader social structures and cultural norms. The "geography of fear" concept helps explain how certain spaces become coded as dangerous for women, regardless of actual crime statistics.

3.1.4 Gender Mainstreaming in Urban Planning

Gender mainstreaming in urban planning involves integrating gender considerations into all aspects of planning processes, from policy development to implementation and evaluation. This approach recognizes that ostensibly gender-neutral policies and designs often have differential impacts on men and women.

The concept of "gender-sensitive planning" goes beyond simply adding women to existing planning processes to fundamentally reconsidering how urban spaces are designed and managed. This includes attention to different mobility patterns, safety concerns, accessibility needs, and use preferences among different demographic groups.

Caroline Moser's framework for gender planning distinguishes between practical gender needs (immediate necessities related to women's existing roles) and strategic gender needs (longer-term goals related to changing gender relations and power structures). This distinction is useful for understanding different types of interventions in urban planning.

International Experiences: Vienna and Umeå

3.2 Vienna, Austria: Pioneer in Gender-Sensitive Urban Planning

Vienna has gained international recognition for its comprehensive approach to gender mainstreaming in urban planning. Since the 1990s, the city has systematically integrated gender considerations into all aspects of urban development, creating a model that has influenced cities worldwide.

Historical Development and Policy Framework

Vienna's commitment to gender-sensitive planning began in 1992 with the establishment of a Women's Office and the adoption of gender mainstreaming as a core principle of city governance. The city's approach is grounded in the recognition that men and women use urban space differently due to varying responsibilities, mobility patterns, and safety concerns.

Map of Vienna [Source: Maps.com]

The 1999 adoption of the "Equitable City" guidelines marked a turning point in Vienna's planning approach. These guidelines mandated that all new urban development projects consider gender impacts and include specific measures to address women's needs. The

guidelines covered everything from street design and public transportation to housing and public space planning.

Transportation and Mobility Innovations

Vienna's transportation planning has been particularly innovative in addressing women's mobility needs. Research conducted by the city in the early 2000s revealed significant gender differences in travel patterns:

- Women made more frequent but shorter trips than men
- Women were more likely to travel with children, elderly family members, or heavy shopping bags
- Women demonstrated greater concern for personal safety, particularly in public transportation
- Women's trip purposes were more diverse, often combining multiple activities in single journeys

Based on these findings, Vienna implemented several transportation innovations:

- **Public Transportation Improvements**: The city redesigned public transportation stops to improve visibility and safety, installed better lighting, and created step-free access to accommodate strollers, wheelchairs, and shopping carts. Real-time information displays were installed to reduce waiting times and improve security.
- **Gender-Sensitive Street Design**: Vienna developed new standards for street design that prioritized pedestrian safety and comfort. This included wider sidewalks to accommodate people walking side by side, more frequent pedestrian crossings, and improved lighting standards specifically designed to enhance women's sense of security.
- **Integrated Planning Approach**: The city adopted an integrated approach that considered the connections between transportation, land use, and daily activity patterns. This led to mixed-use development that reduced the need for long trips and created more vibrant, safer neighborhoods.

Inclusive Public Spaces [Source: Wafmag]

Public Space and Housing Innovations

Vienna's approach to public space design has been equally innovative. The city conducted extensive research on how different demographic groups use parks, playgrounds, and other public spaces, leading to several important changes:

- **Inclusive Playground Design**: Traditional playgrounds were redesigned to serve multiple age groups and activity preferences. Research showed that teenage girls were particularly underserved by conventional playground equipment, leading to the creation of spaces that accommodate activities like volleyball, dancing, and informal socializing.
- **Housing and Neighborhood Design**: Vienna's social housing program has incorporated gender-sensitive design principles, including attention to safety, accessibility, and the needs of single-parent families. Housing complexes include adequate storage for bicycles and strollers, well-lit common areas, and integrated childcare facilities.
- **Safety and Lighting Improvements**: The city implemented comprehensive lighting improvements based on detailed analysis of women's safety concerns. This included not just increasing light levels but improving the quality and distribution of lighting to eliminate dark corners and hidden areas.

Gender Sanitizing Of Open Areas [Source: Wafmag]

Participatory Planning Processes

Vienna's success in gender-sensitive planning has been partly due to its commitment to participatory planning processes that actively involve women in decision-making. The city has developed several innovative approaches:

- **Women's Walking Tours**: Regular walking tours led by women residents help identify specific safety and accessibility concerns in different neighborhoods. These tours have led to numerous small-scale improvements that significantly impact daily experiences.
- **Gender Impact Assessments**: All major planning projects are required to conduct gender impact assessments that analyze potential differential effects on men and women. These assessments are conducted in consultation with community organizations and women's groups.
- **Community Engagement Programs**: The city has established ongoing forums for community input on planning decisions, with specific efforts to ensure women's participation and to address barriers that might prevent their involvement.

Outcomes and Impact

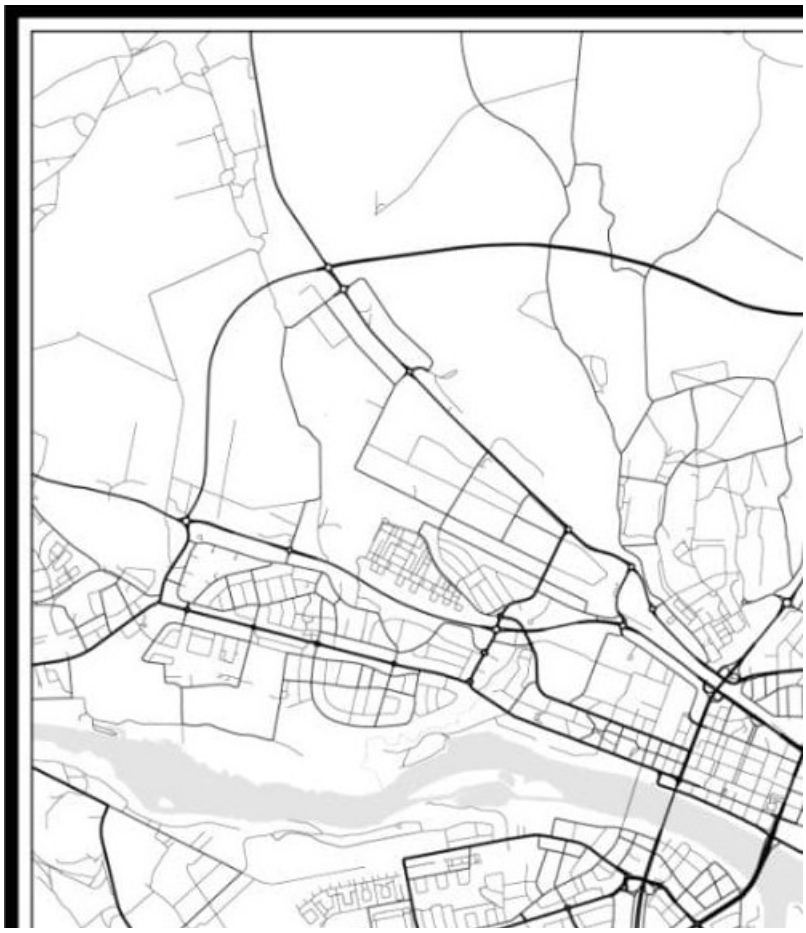
Vienna's comprehensive approach to gender-sensitive planning has produced measurable results:

- Increased use of public transportation by women, particularly during evening hours
- Reduced gender gaps in walking and cycling
- Higher satisfaction rates among women residents regarding neighborhood safety and accessibility
- International recognition as a model for gender-sensitive urban development

The city's experience demonstrates that systematic attention to gender in urban planning requires not just policy commitments but also institutional changes, staff training, and ongoing community engagement. Vienna's success has been built on sustained political support, adequate funding, and a willingness to experiment with new approaches.

3.3 Umeå, Sweden: Compact City Model and Gender Equality

Umeå, located in northern Sweden, provides another important example of how cities can integrate gender considerations into urban planning, particularly in the context of sustainable development and climate considerations.



City Map of Umea [Source: Maps.com]

Compact City Development Model

Umeå's approach to gender-sensitive planning has been closely linked to its compact city development model. The city has pursued a strategy of concentrated urban development that reduces travel distances and promotes sustainable transportation options. This approach has particular benefits for women's mobility:

Reduced Travel Distances: By concentrating services, employment, and housing in compact, mixed-use areas, Umeå has reduced the need for long commutes and complex trip chains. This is particularly beneficial for women who often have responsibility for multiple household tasks and time constraints.

Integrated Transportation Planning: Umeå has developed an integrated transportation system that prioritizes walking, cycling, and public transportation. The city's cold climate has required innovative solutions for winter mobility, including heated bus stops, snow-free pedestrian and cycling paths, and indoor connections between major buildings.

Sustainable Transportation and Gender

Umeå's commitment to sustainable transportation has created opportunities to address gender-specific mobility needs:

- **Winter Cycling Infrastructure**: The city has developed extensive cycling infrastructure designed to function year-round, including heated cycling paths and covered bicycle parking. Research showed that women were more likely than men to abandon cycling during winter months, leading to targeted infrastructure improvements.
- **Public Transportation Design**: Umeå's public transportation system has been designed with particular attention to safety and accessibility. Bus stops are well-lit and located in visible, active areas. The city has also experimented with demand-responsive transportation services for areas with lower population density.
- **Pedestrian Priority**: Umeå has implemented comprehensive pedestrian priority measures, including extensive pedestrian zones in the city center, reduced speed limits in residential areas, and pedestrian-friendly intersection designs. These measures particularly benefit women, who are more likely to walk for transportation.

Gender Equality in Planning Processes

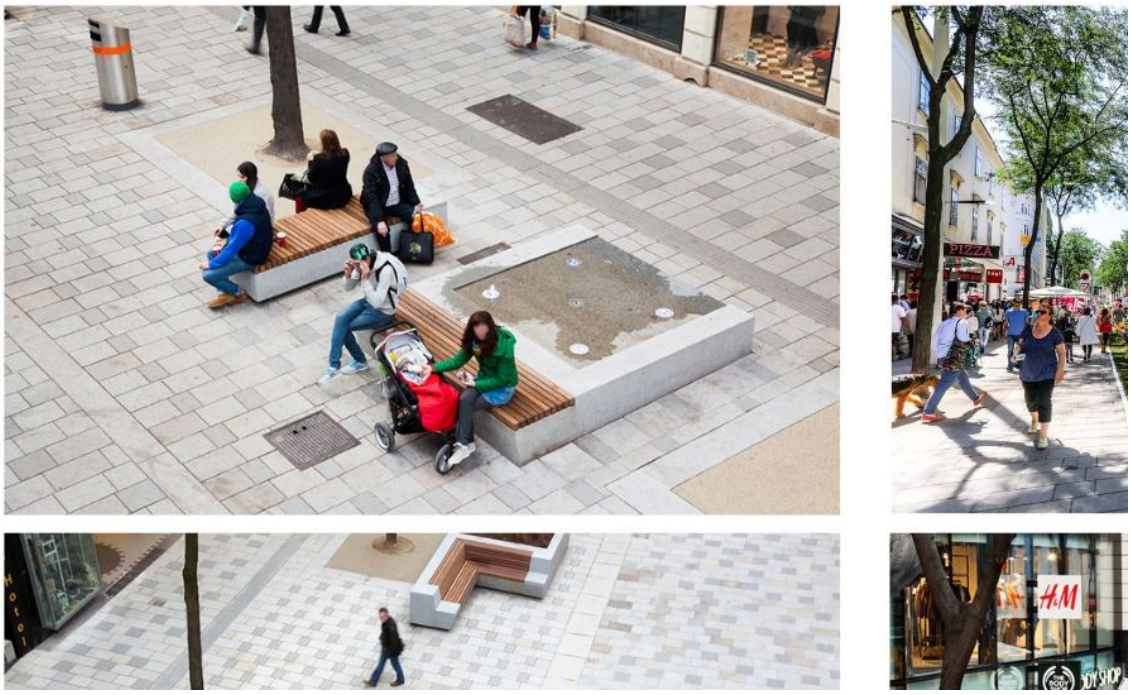
Umeå's approach to gender equality extends beyond infrastructure to include planning processes and governance:

- **Gender-Balanced Participation**: The city has implemented policies to ensure gender-balanced participation in planning committees and decision-making bodies. This includes specific efforts to recruit women for technical committees that have traditionally been male-dominated.
- **Gender-Disaggregated Data**: Umeå systematically collects and analyses gender-disaggregated data on transportation usage, public space utilization, and satisfaction with municipal services. This data informs planning decisions and helps track progress toward gender equality goals.
- **Integration with Climate Planning**: The city has recognized the connections between gender equality and climate action, noting that women often bear disproportionate impacts from climate change and may have different perspectives on sustainability priorities.

Youth and Education Focus

As a university city, Umeå has paid particular attention to the needs of young women and students:

- **Campus Integration**: The city has worked closely with Umeå University to integrate campus planning with municipal planning, creating seamless connections between residential areas, the university, and the city center.
- **Student Transportation**: Special attention has been paid to student transportation needs, including late-night transportation options and secures bicycle parking near student housing.
- **Educational Programs**: Umeå has developed educational programs on gender equality and urban planning, working with the university to train the next generation of planners in gender-sensitive approaches.



Feminist Approach to Public spaces of Umea [Source: urbact.eu]

Lessons and Challenges

Umeå's experience demonstrates both the possibilities and limitations of gender-sensitive planning in smaller cities:

Advantages of Scale: The city's smaller size has allowed for more comprehensive and coordinated planning approaches. Changes can be implemented more quickly and their impacts more easily measured.

Resource Constraints: However, smaller cities like Umeå may have fewer resources for specialized gender expertise or large-scale infrastructure investments.

Cultural Context: Sweden's strong tradition of gender equality provides a supportive context for gender-sensitive planning that may not exist in other cultural contexts.

Climate Considerations: Umeå's experience with winter-responsive infrastructure provides valuable lessons for other cities dealing with challenging climate conditions.

3.4 Synthesis of International Lessons

The experiences of Vienna and Umeå provide several important lessons for gender-sensitive urban planning:

3.4.1 Systematic Approach Required

Both cities demonstrate that effective gender-sensitive planning requires systematic, comprehensive approaches rather than ad hoc interventions. This includes:

- Policy frameworks that mandate gender consideration in all planning processes
- Institutional mechanisms to ensure implementation and accountability

- Staff training and capacity building on gender issues
- Regular monitoring and evaluation of outcomes

3.4.2 Importance of Research and Data

Both cities have invested significantly in research and data collection to understand gender differences in urban experiences. This includes:

- Gender-disaggregated data on transportation usage, public space utilization, and safety concerns
- Qualitative research to understand women's experiences and perspectives
- Regular surveys and assessments to track changes over time
- Participatory research methods that involve women in identifying priorities and solutions

3.4.3 Integration Across Sectors

Successful gender-sensitive planning requires integration across different sectors and policy areas:

- Transportation planning must be coordinated with land use planning
- Housing policy must consider mobility and accessibility needs
- Safety considerations must be integrated into all aspects of design
- Economic development must consider women's access to opportunities

3.4.4 Community Participation and Engagement

Both cities have demonstrated the importance of meaningful community participation:

- Women must be actively involved in planning processes, not just consulted
- Barriers to participation must be identified and addressed
- Different methods of engagement may be needed to reach diverse groups
- Ongoing dialogue and feedback mechanisms are essential

3.4.5 Political Support and Institutional Commitment

The success of gender-sensitive planning in both cities has depended on sustained political support and institutional commitment:

- Leadership commitment at the highest levels of government
- Adequate funding and resources for implementation
- Integration into mainstream planning processes rather than marginalization
- Willingness to experiment and learn from failures

These lessons provide important guidance for developing gender-sensitive planning approaches in other contexts, including cities like Prayagraj that may face different challenges and constraints.

4. Case Studies

4.1 Mumbai: Navigating Megacity Challenges

Mumbai, India's financial capital and most populous city, provides a crucial case study for understanding women's mobility challenges in the context of extreme urban density, economic opportunity, and infrastructure constraints. With a metropolitan population exceeding 20 million and one of the highest population densities in the world, Mumbai's experience offers valuable insights for other Indian cities grappling with rapid urbanization and women's safety concerns.

4.1.1 Urban Context and Demographics

Mumbai's unique urban form, stretching along a narrow peninsula and connected by a critical north-south railway corridor, creates specific mobility challenges for all residents, but particularly for women. The city's economic opportunities attract migrants from across India, creating a diverse population with varying cultural backgrounds, economic status, and mobility needs.

Demographic Profile and Women's Participation:

- Women constitute approximately 42% of Mumbai's population

- Female workforce participation has grown significantly, particularly in the service sector
- The city hosts numerous multinational corporations and has a large informal economy
- Educational levels among women are relatively high compared to other Indian cities
- The city has a significant population of single working women and female heads of households

Economic Context: Mumbai's role as India's commercial capital creates both opportunities and challenges for women's mobility. The concentration of employment in the central business districts requires long commutes for many residents. The city's 24-hour economy means that women often need to travel during non-traditional hours, raising safety concerns.

4.1.2 Transportation System and Women's Mobility

Mumbai's transportation system is dominated by the suburban railway network, which carries over 8 million passengers daily. The system's design and operation have significant implications for women's mobility:

Suburban Railway System: The Mumbai Suburban Railway is often called the "lifeline of Mumbai," but it presents particular challenges for women:

- Extreme overcrowding during peak hours creates safety and comfort concerns
- Long travel times due to limited express services and frequent delays
- Safety concerns during late evening and early morning hours
- Inadequate facilities for women with children or elderly dependents

Women's Special Coaches: One of Mumbai's most significant innovations for women's mobility has been the introduction of women-only railway coaches, first implemented in 1992:

Female Coach in Mumbai Local Train [Source: Times of India]

Implementation and Design:

- Women-only coaches constitute approximately 50% of total railway capacity during peak hours
- Special coaches operate throughout the day, with increased frequency during peak hours
- Clear marking and designated boarding areas help ensure proper usage
- Railway police and women's help desks provide additional security

Impact and Outcomes:

- Significant increase in women's railway usage following implementation
- Reduced incidents of sexual harassment and inappropriate behavior
- Increased sense of safety and comfort for women travelers
- Enabled women to travel during previously avoided time periods

Challenges and Criticisms:

- Some argue that women-only coaches reinforce gender segregation rather than addressing root causes of harassment
- Overcrowding issues persist within women's coaches during peak hours
- Limited effectiveness in connecting to other modes of transportation
- Maintenance and cleanliness issues in some coaches

Bus Transportation System: Mumbai's bus system, operated by the Brihanmumbai Electric Supply and Transport (BEST), serves as a crucial link for areas not connected by rail:

Women's Safety Initiatives:

- Introduction of women-only buses during peak hours
- Installation of CCTV cameras and panic buttons
- Training programs for bus drivers and conductors on women's safety
- Improved lighting at bus stops and terminals

Accessibility Improvements:

- Low-floor buses to improve accessibility for women with children and elderly passengers
- Reserved seating for women, elderly, and disabled passengers
- Better integration with railway stations and major destinations

4.1.3 Public Space Utilization and Safety Interventions

Mumbai's dense urban environment creates unique challenges for public space utilization, with limited open space and high competition for use of available areas.

Public Space Constraints:

- Extremely limited per capita open space compared to international standards
- High population density creates intense competition for public space usage

- Many public spaces are not well-maintained or adequately lit
- Cultural norms and safety concerns limit women's use of available spaces

Inclusive Public space utilization under flyover [Source: re-thinkingthefuture.com]

Safety Interventions and Programs:

Police Initiatives: Mumbai Police has implemented several programs specifically targeting women's safety:

- **Nirbhaya Squad**: Special units dedicated to women's safety, particularly in public spaces and transportation hubs
- **She Teams**: Plainclothes female officers deployed in areas with high incidents of harassment
- **Safe City Project**: Comprehensive CCTV network and emergency response system
- **Awareness Programs**: Regular campaigns on women's rights and safety resources

Community-Based Initiatives:

- **Women's Safety Groups**: Neighborhood organizations focused on creating safer environments
- **Self-Defense Training**: Programs offered through municipal corporations and NGOs
- **Safe Space Mapping**: Community-led initiatives to identify and address unsafe areas

Technology Interventions:

- Mobile applications for reporting safety concerns and accessing emergency services
- GPS tracking systems for public transportation
- Smart bus stops with emergency communication facilities
- Online platforms for sharing safety information and resources

Mumbai Coastline served as inclusive gendered space but in small pockets [Source: Hindustan Times]

4.1.4 Urban Planning and Policy Responses

Mumbai's urban planning approach has evolved to incorporate women's safety and mobility concerns, though implementation remains challenging due to the city's complex governance structure and resource constraints.

Policy Framework:

Mumbai Metropolitan Region Development Authority (MMRDA) Initiatives:

- Integration of gender considerations into regional transportation planning
- Guidelines for women-friendly infrastructure design
- Coordination between different transportation agencies
- Focus on improving first-mile and last-mile connectivity

Municipal Corporation Policies:

- Mandatory safety audits for public spaces and transportation facilities
- Guidelines for street lighting and visibility improvements
- Integration of women's safety considerations into development approvals
- Community participation requirements for public space planning

4.1.5 Urban Planning Interventions

Mumbai's urban planning responses to women's safety concerns have evolved through multiple phases, reflecting changing understanding of gender-sensitive planning principles.

The Safe City initiative, launched in 2013, focused on improving street lighting, installing CCTV cameras, and creating women-friendly infrastructure. Under this program, over 5,000 streetlights were upgraded, and 1,200 CCTV cameras were installed in high-traffic areas. The initiative also included the creation of women-only parking spaces in major commercial areas and the establishment of help desks at major transport terminals.

Public transport improvements have been substantial. The introduction of women-only buses during peak hours, expansion of women-only compartments in local trains, and the creation of dedicated waiting areas at bus stops represent significant interventions. The Mumbai Metropolitan Region Development Authority has also implemented a policy requiring all new bus stops to include well-lit waiting areas with clear sight lines and emergency communication systems.

Urban design modifications have focused on creating more inclusive public spaces. The redevelopment of areas like Bandra-Kurla Complex incorporated gender-sensitive design principles, including wider sidewalks, better lighting, and the integration of commercial activities at street level to maintain natural surveillance. The concept of "active frontages" has been promoted to ensure continuous activity along streets, reducing isolated spaces that may pose safety risks.

4.1.6 Outcomes and Lessons Learned

The interventions in Mumbai have yielded mixed but generally positive outcomes. Quantitative measurements show a 30% increase in women's usage of public transport during off-peak hours following safety improvements. The percentage of women reporting feeling "safe" or "very safe" in public spaces increased from 42% in 2010 to 58% in 2020.

However, challenges persist. The rapid pace of urban development often outstrips the implementation of safety measures, creating new unsafe spaces. The informal nature of many urban settlements makes it difficult to implement standardized safety interventions. Additionally, the focus on infrastructure improvements, while necessary, has not been sufficient to address deeper social and cultural factors influencing women's safety.

Key lessons from Mumbai's experience include the importance of integrated approaches combining infrastructure improvements with social programs, the need for continuous monitoring and adaptation of interventions, and the critical role of community participation in identifying safety concerns and solutions.

4.2 Kochi Case Study: Coastal Urban Dynamics and Women's Mobility

Kochi, the commercial capital of Kerala, presents a distinct urban context for examining women's mobility patterns. With a metropolitan population of approximately 2.1 million, Kochi's geography as a coastal city with multiple islands connected by bridges creates unique mobility challenges and opportunities for women.

4.2.1 Geographical Context and Mobility Infrastructure

Kochi's unique geography, spanning mainland areas and multiple islands including Willingdon Island, Bolgatty Island, and Vypeen Island, necessitates a complex transportation network. The city's mobility infrastructure includes roads, waterways, and limited rail connectivity, creating a multi-modal transportation environment that significantly impacts women's travel patterns.

The Kochi Metro, operational since 2017, has introduced a new dimension to urban mobility. The 25.6-kilometer network connecting Aluva to Pettah has demonstrated significant impact on women's mobility patterns. Data from Kochi Metro Rail Limited indicates that women constitute 45% of metro passengers, a higher percentage compared to other Indian metro

systems. This higher representation is attributed to the metro's safety features, cleanliness, and reliable scheduling.

Water transport, a traditional mode of mobility in Kochi, continues to play a significant role in connecting island communities to the mainland. However, women's utilization of water transport is limited, with only 28% of ferry passengers being women. Safety concerns, particularly during evening hours, and the lack of gender-sensitive facilities at ferry terminals contribute to this lower utilization.

The road network in Kochi faces typical challenges of Indian urban areas, including traffic congestion, inadequate parking, and safety concerns. However, Kerala's higher literacy rates and relatively progressive social attitudes toward women's mobility create a more enabling environment compared to many other Indian cities.

4.2.2 Cultural and Social Factors Influencing Women's Mobility

Kerala's social context, characterized by higher levels of education, greater gender awareness, and progressive social policies, significantly influences women's mobility patterns in Kochi. The state's historical matrilineal traditions in certain communities have contributed to relatively greater acceptance of women's mobility and participation in public spaces.

Educational attainment among women in Kochi is notably high, with female literacy rates exceeding 95%. This educational advantage translates into higher workforce participation rates for women, with 67% of working-age women in Kochi engaged in economic activities, compared to the national average of 23%. Higher economic participation directly correlates with increased mobility needs and greater utilization of public spaces.

The concept of "safety through social capital" is particularly relevant in Kochi's context. The city's strong community networks and social cohesion contribute to perceived safety in public spaces. Women report feeling safer in traditional market areas and community spaces where social relationships and mutual recognition provide informal security mechanisms.

However, rapid urbanization and changing social structures are creating new challenges. The emergence of new commercial areas, shopping malls, and entertainment districts has introduced spaces where traditional social safety mechanisms may not operate effectively. Young women, in particular, report feeling less secure in these newer urban spaces compared to traditional neighborhood areas.

4.2.3 Public Space Utilization Patterns

Women's utilization of public spaces in Kochi demonstrates both opportunities and constraints shaped by the city's unique characteristics. Traditional public spaces, including markets, temples, and community centers, show high levels of women's participation. The famous Mattancherry market area, for instance, has women comprising over 60% of regular users during daytime hours.

Recreational spaces present a more complex picture. Marine Drive, one of Kochi's most popular public spaces, shows significant gender disparities in usage patterns. While women constitute 40% of users during afternoon hours (2-5 PM), their representation drops to less than 20% during evening hours (6-9 PM). This temporal segregation reflects safety concerns and social expectations regarding women's presence in public spaces during certain times.

Kochi CBD serves as recreation zone as well [Source: The Hindu]

The introduction of modern shopping complexes and entertainment venues has created new categories of public spaces with different usage patterns. These spaces attract younger women and working professionals but may be less accessible to women from lower economic backgrounds due to implicit class barriers and associated costs.

Beach areas, a significant component of Kochi's public space landscape, demonstrate complex usage patterns. While beaches are popular recreational spaces, women's utilization is constrained by safety concerns, particularly during less crowded periods. Cultural factors also influence beach usage, with traditional dress codes and social expectations affecting women's comfort levels in these spaces.

4.2.4 Transportation Mode Preferences and Safety Perceptions

Women in Kochi demonstrate distinct preferences for different transportation modes based on safety perceptions, convenience, and cultural factors. The Kochi Metro has emerged as the preferred mode for longer distances, with 78% of female passengers citing safety as the primary reason for preference. The metro's features, including CCTV surveillance, well-lit stations, and security personnel presence, contribute to positive safety perceptions.

Auto-rickshaws, while widely available, are used with caution by women, particularly for shorter distances within familiar neighborhoods. The lack of standardized safety features and occasional reports of harassment have led to the development of informal safety strategies, including sharing rides with known individuals and avoiding auto-rickshaw travel during late hours.

Bus transport utilization among women shows interesting patterns. Government-operated KSRTC buses are preferred over private buses due to better regulation and accountability mechanisms. However, crowding during peak hours and inadequate facilities at bus stops limit the attractiveness of bus transport for many women.

Private vehicle ownership among women in Kochi has increased significantly, with two-wheeler ownership among women rising by 35% between 2015 and 2020. This increase

reflects growing economic independence, perceived safety benefits of private transport, and the flexibility it provides for managing multiple responsibilities.

Integration of Green & Grey spaces [Source: Urbanacres]

4.2.5 Planning Interventions and Policy Responses

Kochi's approach to addressing women's mobility and safety concerns has been characterized by both innovative solutions and traditional planning challenges.

- The city's Master Plan 2031 explicitly incorporates gender-sensitive planning principles, representing a significant advancement in planning practice.

- The Safe City initiative in Kochi has focused on improving lighting infrastructure, with over 15,000 LED streetlights installed in high-traffic areas. The initiative also included the creation of gender-sensitive public toilet facilities and the establishment of women-only parking spaces in major commercial areas.

- The Kochi Metro project incorporated gender-sensitive design from its inception. Features include wide platforms, adequate lighting, clear sight lines, and the provision of women-only coaches during peak hours. The success of these measures is reflected in the high percentage of women users and positive safety ratings.

- Waterfront development projects, including the Marine Drive extension and the creation of new promenades, have incorporated safety and accessibility considerations. These projects include improved lighting, wider walkways, and the integration of commercial activities to maintain natural surveillance throughout the day.

4.2.6 Challenges and Opportunities

Despite positive interventions, Kochi faces ongoing challenges in ensuring equitable access to mobility and public spaces for women. Rapid urban growth has created new peripheral areas where infrastructure development lags behind population growth, creating safety and accessibility challenges.

The integration of traditional and modern transportation modes remains incomplete. While the metro system has improved connectivity, last-mile connectivity challenges persist, particularly in accessing ferry terminals and metro stations from residential areas.

Economic disparities affect women's ability to access safer transportation options. While middle-class women may choose private transport or metro travel for safety reasons, women from lower economic backgrounds often have limited options and may be forced to use less safe but more affordable transportation modes.

However, opportunities exist for further improvement. The development of integrated transportation systems, expansion of the metro network, and the planned introduction of electric buses present opportunities to enhance women's mobility. The city's relatively progressive social environment provides a foundation for implementing innovative gender-sensitive planning solutions.

4.3 Comparative Analysis: Mumbai and Kochi

4.3.1 Scale and Context Differences

The comparison between Mumbai and Kochi reveals how urban scale and context significantly influence women's mobility patterns and safety concerns. Mumbai's megacity scale (population over 20 million) creates different challenges compared to Kochi's medium-city scale (population 2.1 million). In Mumbai, the sheer volume of users and complexity of transportation networks creates both opportunities (through anonymity and crowd safety) and challenges (through overcrowding and system strain).

Kochi's smaller scale allows for more personalized and community-based safety mechanisms but may limit the economic viability of certain safety interventions. The cost per capita of safety infrastructure in Kochi is higher than in Mumbai due to lower user volumes, but implementation and monitoring are more manageable.

Economic contexts also differ significantly. Mumbai's status as India's financial capital creates higher income levels and greater resource availability for transportation choices. Women in Mumbai have access to a wider range of transportation options, including app-based ride services, chartered buses, and private vehicles. Kochi's economy, while growing, offers fewer transportation alternatives, making public transport improvements more critical for women's mobility.

4.3.2 Cultural and Social Context Variations

Cultural factors play distinct roles in shaping women's mobility in both cities. Mumbai's cosmopolitan character and diverse population create a more anonymous urban environment where traditional social restrictions may be less pronounced. However, this anonymity can also reduce the informal social safety mechanisms that operate in smaller communities.

Kochi benefits from Kerala's progressive social attitudes toward women's education and workforce participation. This cultural foundation provides greater social acceptance of women's mobility, but traditional expectations regarding appropriate times and spaces for women's presence still influence behavior.

The concept of "safety through visibility" operates differently in both contexts. In Mumbai, crowded public spaces may provide safety through numbers but can also enable different forms of harassment. In Kochi, smaller crowds may provide better possibilities for intervention and assistance but may also create isolation risks.

4.3.3 Infrastructure and Planning Approach Differences

Infrastructure approaches in both cities reflect their different scales and resources. Mumbai's infrastructure interventions are necessarily large-scale and standardized, focusing on system-wide improvements such as women-only train compartments and extensive CCTV networks. These interventions benefit from economies of scale but may not address localized concerns effectively.

Kochi's infrastructure approach can be more targeted and responsive to specific community needs. The city's smaller scale allows for more experimental approaches and community-specific solutions. However, resource constraints may limit the scope and sustainability of interventions.

Planning processes also differ significantly. Mumbai's planning involves multiple agencies and complex coordination challenges, often resulting in slower implementation but potentially more comprehensive solutions. Kochi's planning processes are more streamlined but may lack the resources for large-scale transformative interventions.

4.3.4 Lessons for Medium-Sized Cities

The experiences of Mumbai and Kochi provide valuable lessons for medium-sized cities like Prayagraj. From Mumbai's experience, the importance of integrated, system-wide approaches to safety becomes evident. Infrastructure improvements must be coupled with operational changes and social interventions to be effective.

Kochi's experience demonstrates the potential for leveraging cultural and social advantages while addressing infrastructure deficits. The success of the Kochi Metro in attracting women users shows how well-designed public transport can significantly impact mobility patterns.

Both cases highlight the importance of continuous monitoring and adaptation. Safety concerns and mobility patterns evolve with urban development, requiring responsive planning and policy frameworks.

5: Case Area - Prayagraj

5.1 Historical and Geographic Context

Prayagraj, formerly known as Allahabad, stands as one of India's most historically significant cities, located at the confluence of the Ganga, Yamuna, and mythical Saraswati rivers in Uttar Pradesh. With a metropolitan population of approximately 1.5 million, Prayagraj represents a medium-sized Indian city with unique characteristics that significantly influence women's mobility and public space utilization.

The city's geography is fundamentally shaped by its riverine location. The Sangam area, where the rivers meet, serves as both a spiritual center and a geographic anchor for urban development. This unique positioning creates distinct zones within the city: the Civil Lines area with its colonial-era planning, the densely populated old city areas near the rivers, and newer residential and commercial developments in the peripheral areas.

The Triveni Sangam's religious significance attracts millions of pilgrims annually, creating periodic massive influxes of visitors that strain urban infrastructure and significantly impact local mobility patterns. During major religious festivals like Kumbh Mela, the city's population can increase by several million, fundamentally altering the urban landscape and creating unique challenges for women's mobility and safety.

Prayagraj's administrative importance as a divisional headquarters and its educational significance as home to the University of Allahabad (now University of Prayagraj) create additional layers of urban complexity. The presence of numerous government offices, courts, and educational institutions generates specific mobility patterns and creates distinct user groups with varying needs and safety concerns.

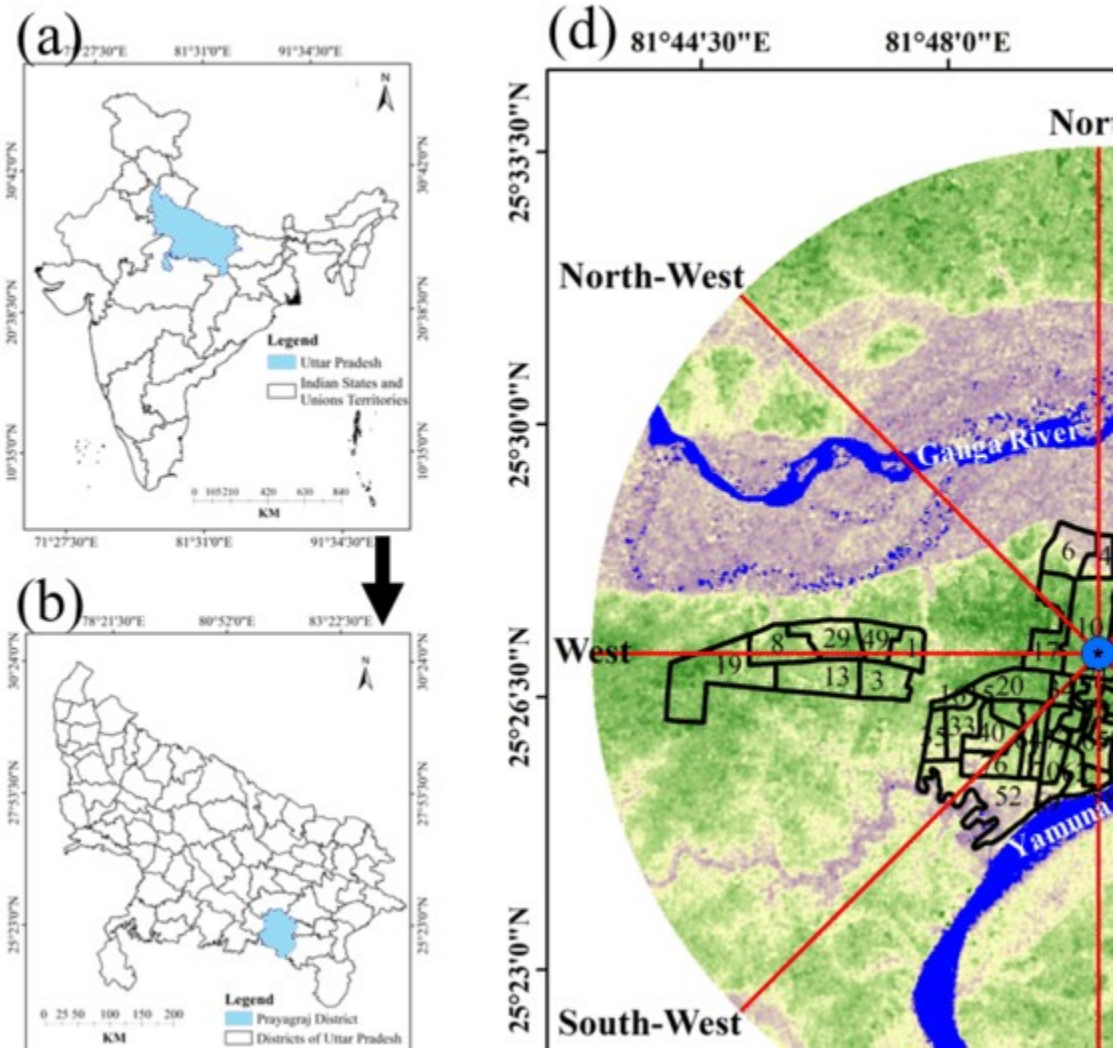
5.2 Demographic Profile and Women's Status

5.2.1 Statistical Profile and Demographic Analysis

Prayagraj, situated at the confluence of the Ganges, Yamuna, and mythical Saraswati rivers in Uttar Pradesh, represents a unique case study for understanding women's mobility and public space utilization in the context of India's rapidly urbanizing cities. This section provides a comprehensive statistical analysis of the city's demographic, economic, and spatial characteristics that influence women's urban experiences.

Population and Growth Patterns

According to the most recent data, Prayagraj's urban agglomeration has reached 6.9 million residents as of 2024, making it one of India's largest metropolitan areas. The city has experienced rapid population growth, with a decadal growth rate of 20.6% between 2001-2011, indicating significant urban expansion and in-migration pressures.



Gender Demographics:

- **Total Population**: 6,914,000 (2024 estimate)
- **Sex Ratio**: 901 females per 1000 males
- **Urban Sex Ratio**: 898 females per 1000 males (slightly lower than rural areas)
- **Child Sex Ratio (0-6 years)**: 899 girls per 1000 boys

The sex ratio of 901 females per 1000 males indicates a significant gender imbalance, with approximately 346,000 fewer women than men in the urban area. This imbalance has important implications for women's experiences in public spaces and their mobility patterns, as it may contribute to their minority status in public environments.

Age Structure and Lifecycle Analysis:

Age Group	Female Population (%)	Male Population (%)	Gender Ratio
0-14 years	28.2%	30.1%	894:1000
15-29 years	26.8%	28.4%	901:1000
30-49 years	25.4%	24.8%	978:1000

Age Group	Female Population (%)	Male Population (%)	Gender Ratio
50-64 years	13.1%	11.9%	1052:1000
65+ years	6.5%	4.8%	1292:1000

Table 5.2.1

The age structure reveals several important patterns:

- Women constitute a smaller proportion of the population in younger age groups
- The gender ratio improves with age, with women outnumbering men in older age categories
- The largest cohort of women (25.4%) is in the prime working age group (30-49 years)
- 26.8% of women are in the 15-29 age group, representing young adults, students, and early-career workers

Educational Attainment by Gender:

Education Level	Female (%)	Male (%)	Gender Gap
Illiterate	35.2%	18.7%	-16.5 pp
Literate but below primary	8.9%	9.1%	-0.2 pp
Primary (Class I-V)	12.3%	14.2%	-1.9 pp
Middle (Class VI-VIII)	15.6%	18.4%	-2.8 pp
Secondary (Class IX-X)	12.4%	16.8%	-4.4 pp
Higher Secondary (Class XI-XII)	9.2%	12.6%	-3.4 pp
Graduate and above	6.4%	10.2%	-3.8 pp

Table 5.2.2

Overall Literacy Rate: 72.3% (Male: 81.3%, Female: 62.1%)

The educational statistics reveal significant gender disparities:

- Female literacy rate is 19.2 percentage points lower than male literacy
- 35.2% of women are illiterate compared to 18.7% of men
- Gender gaps persist across all education levels but are most pronounced in higher education
- Only 6.4% of women have graduate-level education compared to 10.2% of men

These educational disparities have direct implications for women's economic participation, mobility patterns, and confidence in navigating urban spaces.

5.2.2 Economic Participation and Employment Statistics

Female Workforce Participation

While specific data for Prayagraj is limited, analysis of available statistics and national trends provides insights into women's economic participation:

Estimated Workforce Participation Rates (based on Uttar Pradesh urban averages):

- **Female Labour Force Participation Rate**: 18.2%
- **Male Labour Force Participation Rate**: 77.8%
- **Female Work Participation Rate**: 16.1%
- **Male Work Participation Rate**: 75.2%

Employment Sector Distribution (estimated for urban Prayagraj):

Sector	Female Workers (%)	Male Workers (%)
Agriculture	8.2%	12.4%
Manufacturing	22.1%	28.7%
Construction	2.3%	18.9%
Trade and Commerce	15.4%	22.8%
Transportation	0.8%	12.4%
Education	28.7%	8.9%
Health and Social Work	12.4%	3.2%
Government Services	8.9%	11.4%
Other Services	1.2%	1.3%

Table 5.2.3

Employment Characteristics:

- **Regular Employment**: 52% of working women (compared to 48% of men)
- **Casual Labor**: 28% of working women (compared to 35% of men)
- **Self-Employment**: 20% of working women (compared to 17% of men)

Income Distribution (estimated monthly household income):

Income Category	Households with Female Earners (%)
Below ₹10,000	34.2%
₹10,000-₹25,000	38.7%
₹25,000-₹50,000	19.8%
₹50,000-₹1,00,000	6.1%
Above ₹1,00,000	1.2%

Table 5.2.4

The economic data reveals several important patterns:

- Very low female workforce participation, even by Indian urban standards
- Women concentrated in education and health sectors
- Higher proportion of women in regular employment compared to men
- Most women workers in lower and middle-income categories

5.2.3 Spatial Distribution and Urban Structure

Administrative Geography

Prayagraj district is administratively divided into:

- **8 Tehsils**: Sarai Inayat, Soraon, Phulpur, Handia, Bara, Karchhana, Meja, Koraon
- **20 Development Blocks**
- **10 Municipal Bodies**
- **4 Nagar Panchayats**

Urban Agglomeration Structure:

The Prayagraj urban agglomeration consists of:

1. **Prayagraj Municipal Corporation** (core city)
2. **Prayagraj Cantonment Board**
3. **Naini** (industrial area)
4. **Phaphamau** (suburban area)
5. Various **census towns** and **outgrowths**

Population Density Analysis:

Area Type	Population Density (per sq km)	Female Density (per sq km)
Core City Areas	8,500-12,000	3,800-5,400
Suburban Areas	3,000-6,000	1,350-2,700
Peripheral Areas	500-2,000	225-900
Industrial Areas	4,000-8,000	1,600-3,200

Table 5.2.5

Key Urban Centers and Women's Activity Patterns:

1. **Civil Lines**: Administrative and commercial center
    - High concentration of government offices
    - Educational institutions (University of Allahabad)
    - Commercial establishments
    - Estimated daily female footfall: 45,000-50,000
2. **Chowk Area**: Traditional commercial center
    - Dense market areas and traditional bazaars
    - Mixed residential-commercial land use
    - Cultural and religious sites
    - Estimated daily female footfall: 35,000-40,000
3. **Georgetown**: Mixed-use area with educational institutions
    - Several colleges and schools
    - Residential areas for middle-income families
    - Health facilities
    - Estimated daily female footfall: 25,000-30,000

5.2.4 Transportation Infrastructure and Mobility Statistics

Road Network and Connectivity:

- **Total Urban Road Length**: Approximately 2,400 km
- **Road Density**: 8.2 km per sq km
- **Paved Roads**: 78% of total road network
- **Street Lighting Coverage**: 65% of roads

Public Transportation System:

Transport Mode	Daily Ridership	Female Ridership (%)	Peak Hour Frequency
City Buses	180,000	35%	Every 15-20 minutes
Auto-rickshaws	450,000 trips	28%	On-demand
Cycle Rickshaws	320,000 trips	42%	On-demand
Private Vehicles	680,000 trips	18%	N/A

Table 5.2.6

Railway Connectivity:

- **Prayagraj Junction**: Major railway hub with 6 platforms
- **Daily Train Services**: 180+ trains
- **Daily Passengers**: Approximately 85,000
- **Female Passengers**: Estimated 32% of total passengers

Transportation Mode Share (for women's trips):

Mode	Work Trips (%)	Education (%)	Shopping (%)	Healthcare (%)	Social/Recreation (%)
Walking	35%	28%	45%	38%	42%
Cycle Rickshaw	25%	22%	28%	24%	20%
Auto-rickshaw	18%	15%	12%	22%	18%
Bus	12%	20%	8%	10%	8%
Private Vehicle	8%	12%	5%	4%	10%
Bicycle	2%	3%	2%	2%	2%

Table 5.2.7

5.2.5 Safety and Crime Statistics

Crime Against Women Data (2023 statistics for Prayagraj district):

Crime Category	Reported Cases	Rate per 100,000 Women	Conviction Rate (%)
Total Crimes Against Women	1,247	89.2	23.8%
Sexual Harassment	342	24.5	18.2%
Assault with Intent to Outrage Modesty	285	20.4	21.7%
Rape	156	11.2	35.6%
Domestic Violence	298	21.3	15.4%
Kidnapping and Abduction	89	6.4	42.1%
Dowry-related Crimes	77	5.5	28.9%

Table 5.2.8

Streets lack proper pedestrian walkway [Source: Harshita Singh]

Spatial Distribution of Crime Against Women:

Area Type	Crime Rate per 100,000 Women	Most Common Crime Type
Commercial Areas	156.8	Sexual Harassment
Transportation Hubs	234.5	Assault/Harassment
Educational Areas	89.4	Harassment/Stalking
Residential Areas	67.2	Domestic Violence

Area Type	Crime Rate per 100,000 Women	Most Common Crime Type
Industrial Areas	98.7	Workplace Harassment

Table 5.2.9

Temporal Patterns of Crime:

Time Period	Incidents (%)	Location Pattern
6:00-9:00 AM	18%	Transportation, Markets
9:00-12:00 PM	22%	Workplaces, Public Spaces
12:00-3:00 PM	15%	Markets, Educational Areas
3:00-6:00 PM	28%	Transportation, Public Spaces
6:00-9:00 PM	12%	Public Spaces, Markets
9:00 PM-6:00 AM	5%	Residential Areas

Table 5.2.10

Reporting and Response Statistics:

- **Crimes Reported to Police**: 73% (estimated)
- **Average Response Time**: 23 minutes
- **Cases Investigated**: 89%
- **Cases Charge-sheeted**: 67%
- **Women Police Stations**: 3 in urban area
- **Help Desk Facilities**: 12 locations

5.2.6 Economic and Development Context

Municipal Budget Allocation (2023-24):

Sector	Budget Allocation (Crores ₹)	Women-specific Allocation (%)
Transportation	245.7	8.2%
Public Safety	156.3	12.4%
Urban Development	389.4	6.7%
Health and Social Services	178.9	22.1%
Education	234.6	18.9%
Water and Sanitation	167.8	15.3%

Table 5.2.11

Smart City Mission Investment (2016-2024):

Project Type	Investment (Crores ₹)	Gender-sensitive Components (%)
Intelligent Transport Systems	145.2	25%
Public Safety and Security	89.7	45%

Project Type	Investment (Crores ₹)	Gender-sensitive Components (%)
e-Governance	67.4	15%
Water Supply and Management	234.8	20%
Waste Management	78.9	30%
Public Spaces Development	123.6	35%

Table 5.2.12

5.3 Spatial Analysis and Urban Form

5.3.1 Land Use Patterns and Women's Activity Spaces

Prayagraj's urban form reflects its historical development as an administrative and religious center, with distinct areas serving different functions. Understanding the spatial distribution of activities and land uses is crucial for analyzing women's mobility patterns and public space utilization.

Mixed Land Use Analysis:

The city exhibits a complex pattern of mixed land uses, particularly in the older areas:

1. **High Mixed-Use Areas (>70% mixed use)**:
    - Chowk and surrounding traditional bazaar areas
    - Civil Lines commercial corridors
    - Georgetown educational-residential zone
    - Katra religious-commercial area
2. **Moderate Mixed-Use Areas (40-70% mixed use)**:
    - Suburban residential areas with scattered commercial
    - Industrial areas with worker housing
    - Transportation corridors with mixed development
3. **Single-Use Dominant Areas (<40% mixed use)**:
    - Pure residential colonies
    - Institutional areas (university campus, government offices)
    - Industrial zones
    - Large-scale infrastructure (airport, railway yards)

Women's Activity Concentration Areas:

Based on field observations and available data, women's activities are concentrated in specific urban areas:

Area	Primary Functions	Female Footfall (daily)	Peak Hours
Civil Lines Market	Shopping, Services, Office Work	8,500-9,200	10 AM-1 PM, 4-7 PM
Chowk Bazaar	Traditional Shopping, Banking	6,800-7,500	11 AM-2 PM, 5-8 PM
University Area	Education, Residential	4,200-4,800	8-11 AM, 2-5 PM

Area	Primary Functions	Female Footfall (daily)	Peak Hours
Medical College Area	Healthcare, Education	3,500-4,000	9 AM-12 PM, 3-6 PM

Table 5.2.13

5.3.2 Transportation Network Analysis

Road Hierarchy and Women's Mobility:

Prayagraj's road network follows a hierarchical structure with different implications for women's mobility:

1. **National/State Highways** (NH-2, NH-35, NH-76):
    - High-speed traffic, limited pedestrian facilities
    - Major barriers to east-west and north-south movement
    - Bus rapid transit corridors planned
    - Low female pedestrian usage due to safety concerns
2. **City Arterial Roads**:
    - Major commercial and mixed-use corridors
    - Frequent bus services and auto-rickshaw availability
    - Moderate pedestrian infrastructure
    - Higher female usage during daylight hours
3. **Collector Roads and Local Streets**:
    - Neighborhood connectivity and access
    - Mixed traffic with pedestrians, cyclists, and vehicles
    - Variable infrastructure quality
    - Primary routes for women's daily mobility

5.3.3 Public Space Distribution and Accessibility

Spatial Distribution of Public Spaces:

Public spaces in Prayagraj are unevenly distributed, with higher concentrations in central areas and significant gaps in peripheral zones:

1. **Central Area Public Spaces**:
    - Chandrashekhar Azad Park (Alfred Park): 133 acres
    - Company Garden: 22 acres
    - Multiple smaller neighborhood parks: 45 total acres
    - Religious spaces: Sangam, temples, mosques
2. **Suburban Public Spaces**:
    - Scattered neighborhood parks: 67 acres total
    - School playgrounds (limited public access)
    - Community centers: 15 facilities
3. **Peripheral Area Deficits**:
    - Very limited formal public spaces
    - Reliance on informal spaces (vacant lots, riverbanks)
    - Lack of recreational facilities for women and children

The demographic profile of Prayagraj reveals important patterns that influence women's mobility. According to the 2011 Census (with updated estimates based on growth patterns), women constitute approximately 48% of the city's population, slightly below the national average. However, this percentage varies significantly across different areas of the city.

In the Civil Lines and university areas, the proportion of women is higher due to the presence of educational institutions and government offices that employ significant numbers of women. These areas also attract families of professionals and government employees, contributing to a higher representation of educated women with greater mobility needs.

The old city areas, characterized by traditional commercial activities and dense residential settlements, show different demographic patterns. Here, joint family structures are more common, and women's roles are often more circumscribed by traditional expectations. However, economic necessities increasingly require women's participation in income-generating activities, creating tension between traditional expectations and practical needs.

Peripheral areas, including newer residential developments and slum settlements, present diverse demographic patterns. Planned residential areas attract middle-class families where women may have higher education levels and mobility needs. Informal settlements house migrant populations where women often engage in informal economic activities requiring mobility within constrained safety parameters.

5.3.4 Educational and Economic Participation

Educational levels among women in Prayagraj vary significantly across different areas and age groups. The presence of prestigious educational institutions has historically provided educational opportunities for women, resulting in above-average literacy rates in certain sections of the population. However, significant disparities persist.

In areas near the University of Prayagraj and other educational institutions, women's literacy rates exceed 80%. These areas also show higher levels of higher education attainment among women, with significant percentages holding graduate and postgraduate degrees. This educational advantage translates into higher aspirations for mobility and public space utilization.

Economic participation patterns among women in Prayagraj reflect broader social and economic constraints. Formal sector employment among women is concentrated in government offices, educational institutions, and healthcare facilities. The city's role as an administrative center provides employment opportunities for educated women, but these opportunities are often limited by traditional expectations regarding appropriate work for women.

Informal sector participation is substantial but often invisible in official statistics. Women engage in home-based work, small trading activities, and service provision that requires varying degrees of mobility. These activities often operate within traditional constraints but represent significant economic contributions and generate mobility needs that are not always recognized in formal planning processes.

5.3.5 Social and Cultural Context

The social context in Prayagraj is characterized by the coexistence of traditional and modern values, creating complex dynamics that influence women's mobility. The city's religious

significance reinforces certain traditional expectations regarding women's behavior in public spaces, while its educational and administrative functions expose residents to more progressive ideas about gender roles.

Family structures in Prayagraj tend to be more traditional compared to metropolitan cities, with joint families being common and extended family networks playing significant roles in decision-making. These structures can both constrain and support women's mobility, depending on family attitudes and economic circumstances.

Religious and cultural events play a significant role in shaping public space usage patterns. During religious festivals and ceremonies, women's participation in public spaces increases dramatically but within specific cultural parameters. These events demonstrate both the potential for women's public participation and the continuing influence of traditional norms.

View from Bhardwaj Park at evening [Source: Harshita Singh]

The concept of "izzat" (honor/respectability) remains influential in shaping women's mobility decisions. Concerns about maintaining family and personal reputation can limit women's willingness to use certain public spaces or transportation modes, particularly during specific times or in particular areas of the city.

5.4 Urban Structure and Land Use Patterns

5.4.1 Spatial Organization

Prayagraj's urban structure reflects its historical development and geographic constraints. The city can be broadly divided into several distinct zones, each with different characteristics that influence women's mobility and safety perceptions.

The Civil Lines area, developed during the British colonial period, maintains a planned character with wider roads, organized layouts, and better infrastructure. This area houses government offices, courts, and upscale residential areas. Women's mobility in this area is generally higher due to better infrastructure, lighting, and perceived safety. The presence of government offices also ensures regular security presence and maintenance of public facilities.

The old city areas, centered around traditional markets and religious sites, are characterized by narrow lanes, dense construction, and mixed land use. These areas have high pedestrian activity during daytime hours, which can provide safety through numbers but can also create crowding and harassment opportunities. The traditional character of these areas means that women's mobility is often constrained by social expectations and safety concerns during certain hours.

The Sangam area and surrounding regions experience unique dynamics due to religious tourism. During normal periods, these areas may have limited activity, but during festivals and pilgrimage seasons, they become extremely crowded. This variability creates unpredictable safety conditions for women and requires adaptive mobility strategies.

University areas, particularly around the University of Prayagraj campus, show different patterns. These areas have higher concentrations of educated residents and students, creating environments that may be more accepting of women's mobility. However, the concentration of young people and the presence of hostels and student accommodations can also create safety concerns, particularly during evening hours.

Peripheral residential areas vary significantly in character. Planned residential colonies often have better infrastructure but may lack the commercial activity that provides natural surveillance. Informal settlements may have strong community networks that provide social safety but often lack basic infrastructure including lighting and safe pedestrian pathways.

5.4.2 Commercial and Economic Centers

The distribution of commercial and economic activities significantly influences women's mobility patterns in Prayagraj. Traditional commercial centers are located in the old city areas, including Chowk, Johnstonganj, and areas around major religious sites. These centers attract women for shopping and commercial activities but present challenges related to crowding, inadequate facilities, and safety concerns.

Modern commercial developments, including shopping centers and markets in Civil Lines and newer areas, provide different environments for women's economic participation. These areas often have better infrastructure and facilities but may be less accessible to women from lower economic backgrounds due to cost factors and transportation challenges.

The presence of numerous government offices creates specific mobility patterns, with women traveling to these areas for various administrative purposes. The concentration of these facilities in certain parts of the city creates peak-hour congestion and transportation challenges.

Educational institutions, particularly the university and various colleges, generate significant mobility needs. Women students and faculty require safe and reliable transportation to access these institutions, and the presence of educational facilities influences the safety perceptions of surrounding areas.

5.4.3 Transportation Infrastructure

Prayagraj's transportation infrastructure reflects the challenges common to many medium-sized Indian cities. The road network consists of a mix of colonial-era planned roads in Civil Lines, narrow traditional streets in old city areas, and newer roads in peripheral developments.

Public transportation is primarily provided by buses operated by the Uttar Pradesh State Road Transport Corporation (UPSRTC) and private operators. The bus network covers major routes but often provides inadequate service frequency and comfort levels. Bus stops frequently lack proper facilities, including lighting, seating, and weather protection, creating particular challenges for women users.

Auto-rickshaws and cycle-rickshaws provide important intermediate public transport services. However, the lack of standardized safety features and regulation creates concerns for women passengers. The absence of formal taxi services until recent years meant limited options for women requiring door-to-door transportation.

The introduction of app-based ride services has provided new transportation options, particularly beneficial for women seeking safer and more convenient travel. However, penetration of these services remains limited compared to larger cities, and cost factors may restrict access for many women.

Railway connectivity through Prayagraj Junction (formerly Allahabad Junction) provides inter-city transportation options. The station serves as a major railway hub, but facilities for waiting passengers, particularly women, have historically been inadequate.

Pedestrian infrastructure varies significantly across different areas of the city. Civil Lines areas generally have better sidewalks and pedestrian facilities, while old city areas often lack proper pedestrian pathways. The absence of well-designed pedestrian infrastructure forces women to share road space with vehicles, creating safety risks and limiting mobility options.

5.5 Existing Public Spaces and Their Utilization

5.5.1 Traditional Public Spaces

Prayagraj's traditional public spaces reflect the city's historical and cultural significance. The Sangam area represents the most prominent traditional public space, attracting both religious pilgrims and local residents. Women's utilization of this space varies significantly based on religious occasions, with higher participation during festivals and ceremonies but limited regular use due to safety and accessibility concerns.

Traditional markets in areas like Chowk and Katra serve as important public spaces for women's economic and social activities. These markets demonstrate high levels of women's participation during daytime hours but show significant temporal variations. The crowded nature of these spaces provides some safety through numbers but also creates opportunities for harassment and limits comfortable navigation.

Religious sites throughout the city serve as focal points for women's public activities. Temples, mosques, and other religious buildings attract regular female participation, but usage patterns are constrained by religious and social protocols. These spaces often lack adequate facilities for women, including appropriate restrooms and waiting areas.

Historical sites and monuments, including the Allahabad Fort and Anand Bhavan, function as public spaces but show limited regular utilization by local women. These sites are primarily oriented toward tourists and occasional visitors rather than serving as regular community spaces for local residents.

5.5.2 Modern Public Spaces

The development of modern public spaces in Prayagraj has been limited compared to larger cities. Shopping centers and commercial complexes represent the primary category of new public spaces, but these are often privately managed and may not serve as truly public spaces accessible to all women regardless of economic status.

Parks and recreational areas exist but are often poorly maintained and inadequately designed for women's needs. The absence of proper lighting, security, and facilities limits women's utilization of these spaces, particularly during evening hours when recreational activities might be most convenient for working women.

Cultural facilities, including auditoriums and community centers, provide important public spaces for women's cultural and social activities. However, these facilities are often limited in number and may not be easily accessible from all parts of the city.

Educational institutional spaces, particularly university campuses, serve as semi-public spaces that influence women's spatial experiences. These spaces often provide better infrastructure and safety measures but may not be accessible to non-student populations.

5.6 Current Mobility Patterns and Challenges

5.6.1 Daily Mobility Patterns

Women's daily mobility patterns in Prayagraj reflect the intersection of economic needs, social responsibilities, and safety concerns. Working women typically demonstrate multi-purpose trip patterns, combining work-related travel with household responsibilities such as shopping, healthcare visits, and children's school-related activities.

Morning mobility patterns show peak activity between 8:00 AM and 10:00 AM, with women traveling to work, educational institutions, and market areas. The concentration of government offices and educational institutions creates specific corridors of high activity during these hours. Public transportation usage is highest during this period, but crowding and inadequate services create challenges for comfortable travel.

Afternoon patterns vary significantly based on women's employment status and household responsibilities. Working women may have limited mobility during afternoon hours, while those engaged in household management may undertake shopping and social activities. The lack of adequate public transportation during off-peak hours limits options for women who need to travel during these times.

Evening mobility shows early peak patterns, with most women preferring to complete outside activities before dark. The cultural expectation that women should be home by evening, combined with safety concerns, creates compressed time windows for activities requiring mobility. This temporal compression affects women's ability to participate in evening social, cultural, and economic activities.

5.6.2 Transportation Mode Preferences

Women's transportation mode preferences in Prayagraj reflect a complex calculus involving safety, cost, convenience, and social acceptability. Public buses serve as the primary mode for longer distances, but overcrowding, irregular schedules, and inadequate facilities create significant challenges.

Auto-rickshaws provide important intermediate transport services, but women often use them with caution due to safety concerns and lack of standardized regulations. The practice of sharing auto-rickshaws with unknown passengers, while economically efficient, creates safety anxieties for many women.

Cycle-rickshaws remain popular for shorter distances within neighborhoods, particularly among women from lower economic backgrounds. These vehicles provide door-to-door service and are generally perceived as safer due to lower speeds and familiarity with operators. However, comfort and weather protection are limited.

Private two-wheelers show increasing usage among younger and middle-class women, providing independence and flexibility. However, infrastructure challenges, including poor road conditions and inadequate parking facilities, limit the attractiveness of this option. Social acceptance of women riding two-wheelers varies across different communities and areas of the city.

Walking remains a significant mode of transportation for shorter distances, but inadequate pedestrian infrastructure creates safety and comfort challenges. The absence of proper footpaths, street lighting, and weather protection limits women's willingness to walk, particularly during certain hours or in particular areas.

5.6.3 Safety Concerns and Risk Perceptions

Safety concerns fundamentally shape women's mobility decisions in Prayagraj. Physical safety risks include harassment, assault, and theft, while social safety concerns relate to reputation and community acceptance of women's presence in certain spaces or at certain times.

Temporal safety variations are pronounced, with most women avoiding travel after sunset. The lack of adequate street lighting and reduced activity levels in public spaces during evening hours create perceived and actual safety risks. This temporal constraint significantly limits women's participation in evening economic, social, and cultural activities.

Spatial safety variations reflect the different characteristics of various areas within the city. Women generally feel safer in areas with higher levels of activity and formal surveillance, such as government office areas and established commercial zones. Isolated areas, including peripheral residential locations and riverfront areas, are generally avoided, particularly during non-peak hours.

Mode-specific safety concerns vary significantly. Public buses are perceived as relatively safe due to crowding and public nature, but harassment within crowded conditions remains a concern. Auto-rickshaws create anxiety due to isolation with unknown drivers, while walking alone is avoided in many areas and times.

Social safety concerns relate to community perceptions and judgments about women's mobility. Concerns about reputation and social acceptance can be as constraining as physical safety concerns, particularly for women from traditional families or communities.

5.6.4 Infrastructure Deficits and Service Gaps

Infrastructure deficits significantly constrain women's mobility options in Prayagraj. Inadequate street lighting throughout the city creates safety concerns and limits evening mobility. While main roads may have some lighting, smaller streets and pedestrian areas often lack adequate illumination.

Public transportation infrastructure shows significant deficits. Bus stops often lack basic facilities including seating, weather protection, and lighting. The absence of proper waiting areas creates discomfort and safety concerns, particularly for women traveling alone.

Pedestrian infrastructure is inadequate throughout most of the city. The absence of proper sidewalks forces pedestrians to share road space with vehicles, creating safety risks. Where footpaths exist, they are often poorly maintained, encroached upon, or discontinuous.

Public toilet facilities are scarce and often poorly maintained, creating particular challenges for women who may need to spend extended periods outside their homes. The absence of clean, safe, and accessible public toilets limits women's ability to engage in extended activities outside the home.

Parking facilities for private vehicles are limited, creating challenges for women who have access to private transportation. The absence of secure parking options may deter women from using private vehicles for certain activities or destinations.

5.7 Institutional Framework and Governance

5.7.1 Municipal Governance Structure

The governance of Prayagraj involves multiple agencies and levels of government, creating a complex institutional framework that influences women's mobility and safety initiatives. The Prayagraj Municipal Corporation serves as the primary local government body responsible for urban infrastructure and services.

Urban planning functions are shared between the municipal corporation and the Prayagraj Development Authority (PDA), which handles larger-scale planning and development

activities. This division of responsibilities can create coordination challenges in implementing comprehensive approaches to women's safety and mobility.

The district administration, headed by the District Magistrate, plays a crucial role in law enforcement and public safety initiatives. The coordination between municipal authorities and district administration is essential for effective implementation of women's safety measures.

State-level agencies, including the Uttar Pradesh State Road Transport Corporation and various development authorities, also influence transportation and infrastructure development. The involvement of multiple agencies requires coordinated approaches to address women's mobility comprehensively.

5.7.2 Policy Framework and Initiatives

Recent policy initiatives at state and national levels have begun to address women's safety in urban areas. The Safe City Initiative, implemented in various Indian cities including Prayagraj, represents a significant policy framework focusing on infrastructure improvements and technology-based solutions.

The Uttar Pradesh government's Mission Shakti program specifically addresses women's safety and empowerment, including components related to mobility and public space access. This program includes provisions for improving street lighting, installing CCTV cameras, and creating women-friendly infrastructure in public spaces.

National urban development programs, including the Smart Cities Mission and AMRUT (Atal Mission for Rejuvenation and Urban Transformation), provide frameworks and funding opportunities for infrastructure improvements that can benefit women's mobility. However, the implementation of these programs often lacks specific gender-sensitive components.

The National Urban Transport Policy emphasizes the need for inclusive transportation systems but requires local-level interpretation and implementation to address women's specific needs effectively. The policy framework exists, but translation into ground-level interventions remains incomplete.

5.7.3 Implementation Challenges

The implementation of women's safety and mobility initiatives in Prayagraj faces several institutional challenges. Coordination between different agencies and levels of government often lacks effectiveness, leading to fragmented approaches and gaps in service delivery.

Resource constraints at the municipal level limit the scope and quality of interventions. While policy frameworks may exist at higher levels, adequate funding and technical capacity for implementation often remain insufficient at the local level.

Monitoring and evaluation mechanisms for women's safety initiatives are often inadequate, making it difficult to assess the effectiveness of interventions and make necessary adjustments. The absence of systematic data collection on women's mobility patterns and safety experiences limits evidence-based policy making.

Community participation in planning and implementation processes is often limited, reducing the relevance and effectiveness of interventions. Without adequate consultation with women users, infrastructure improvements may not address actual needs and concerns.

5.7.4 Opportunities for Improvement

Despite challenges, opportunities exist for improving the institutional framework supporting women's mobility in Prayagraj. The growing recognition of gender-sensitive planning principles provides a foundation for more comprehensive approaches.

The availability of funding through national and state programs creates opportunities for implementing infrastructure improvements and innovative solutions. However, accessing these funds requires adequate planning capacity and proposal development skills at the local level.

Technological solutions, including mobile applications for safety reporting and GPS-based tracking systems, provide new opportunities for enhancing women's safety. The increasing penetration of mobile technology creates possibilities for innovative approaches to safety and mobility challenges.

Civil society organizations and women's groups provide important resources for advocacy, awareness, and implementation support. Strengthening partnerships between government agencies and civil society organizations can enhance the effectiveness of women's safety initiatives.

5.8 Socio-Economic Factors Affecting Women's Mobility

5.8.1 Economic Constraints and Opportunities

Economic factors play a crucial role in determining women's mobility options in Prayagraj. Household income levels directly influence the transportation modes available to women, with higher-income families able to afford private vehicles and safer transportation options.

The cost of transportation represents a significant budget item for many families, leading to decisions that may prioritize economic efficiency over safety and comfort. Women from lower-income households may be forced to use less safe but more affordable transportation options or may limit their mobility to reduce transportation costs.

Economic opportunities for women in Prayagraj are often concentrated in specific areas of the city, requiring mobility to access employment. However, the cost and safety concerns associated with transportation to these areas may limit women's ability to take advantage of economic opportunities.

Home-based economic activities, while providing income opportunities that don't require extensive mobility, may limit women's economic potential and social connections. The balance between mobility requirements and economic opportunities creates complex decision-making scenarios for women and their families.

5.8.2 Social Capital and Support Networks

Social capital plays a significant role in facilitating or constraining women's mobility in Prayagraj. Strong family and community networks can provide support and safety mechanisms that enable greater mobility, while restrictive social attitudes can limit women's freedom of movement.

Informal support networks among women, including arrangements for accompanied travel and shared childcare responsibilities, help address some mobility challenges. These networks demonstrate the importance of social solutions to mobility constraints.

Religious and community organizations play important roles in shaping attitudes toward women's mobility. Progressive religious leaders and community organizations can influence social acceptance of women's participation in public spaces, while conservative elements may reinforce restrictive norms.

The presence of educated and economically independent women in communities can create demonstration effects that gradually expand social acceptance of women's mobility. Role models and success stories help challenge traditional constraints and create new possibilities.

5.8.3 Family Structure and Decision-Making

Family structures in Prayagraj significantly influence women's mobility decisions. Joint family systems may provide support for childcare and household management that enables women's mobility, but may also create additional layers of approval and consultation required for mobility decisions.

Decision-making patterns within families affect women's autonomy in mobility choices. In families where women have greater decision-making authority, mobility patterns are likely to be more extensive and flexible. Traditional patriarchal family structures may require women to seek permission for mobility, limiting spontaneous and independent movement.

The presence of children affects women's mobility patterns and transportation choices. School schedules, childcare arrangements, and safety concerns for children create additional complexity in women's mobility decisions. The availability of family support for childcare can significantly enhance women's mobility options.

Inter-generational differences in attitudes toward women's mobility create both opportunities and tensions within families. Younger generations may be more accepting of women's mobility, while older generations may maintain traditional restrictions. These differences require negotiation and gradual change processes.

5.8.4 Cultural and Religious Influences

Cultural and religious factors continue to influence women's mobility in Prayagraj, though these influences are evolving with changing social and economic conditions. Traditional concepts of appropriate behavior for women in public spaces continue to affect mobility decisions.

Religious festivals and observances create both opportunities and constraints for women's public participation. During certain religious periods, women's presence in public spaces may be encouraged or required, while at other times, restrictions may be more pronounced.

Dress codes and behavioral expectations associated with religious and cultural norms can affect women's comfort and safety in public spaces. The need to conform to community expectations may influence women's choices about when, where, and how to travel.

The interpretation of religious and cultural norms varies among different communities and families within Prayagraj. Progressive interpretations may support women's mobility and public participation, while conservative interpretations may emphasize restrictions and limitations.

6. Analysis and Conclusion

6.1 Primary Data

Based on various questionnaire and interview we have assessed outcome on quality, temporal setup, etc.

Infrastructure Quality Assessment:

Infrastructure Element	Coverage (%)	Quality Rating	Female User Satisfaction
Street Lighting	65%	2.8/5	2.1/5
Sidewalks	42%	2.2/5	2.0/5
Public Toilets	35%	1.9/5	1.6/5
Bus Stops	78%	2.5/5	2.3/5
CCTV Coverage	28%	3.1/5	2.8/5
Emergency Services	85%	3.2/5	2.9/5

Table 6.1.1

Pedestrian Infrastructure Quality:

Infrastructure Element	Core Areas	Suburban Areas	Peripheral Areas
Sidewalk Availability	65%	35%	15%
Sidewalk Quality (1-5)	2.8	2.1	1.6
Pedestrian Crossings	Every 200m	Every 400m	Every 800m
Street Lighting	78%	52%	28%
Safety Features	Moderate	Low	Very Low

Table 6.1.2

6.1.1 Scale and Infrastructure Comparisons

The comparison of Prayagraj with Mumbai and Kochi reveals how urban scale and infrastructure development levels significantly influence women's mobility and public space utilization patterns. Each city's unique characteristics provide insights into the relationship between urban development and gender-inclusive mobility.

Mumbai's megacity scale provides both advantages and disadvantages for women's mobility. The extensive public transportation network, including suburban railways and bus systems, provides mobility options that are not available in smaller cities. However, the massive scale also creates overcrowding, longer commute distances, and system complexity that can create barriers for women users.

Kochi's medium-city scale, similar to Prayagraj, demonstrates the potential for more manageable and responsive urban systems. The successful implementation of the Kochi Metro shows how medium-sized cities can implement high-quality public transportation that

effectively serves women users. The smaller scale allows for more targeted interventions and community-responsive solutions.

Prayagraj's infrastructure deficits compared to both Mumbai and Kochi reveal the importance of basic infrastructure provision in enabling women's mobility. While Mumbai may have overcrowding issues and Kochi may have limited coverage, both cities provide basic infrastructure standards that are often absent in Prayagraj.

6.1.2 Infrastructure and Public Space Analysis

Public Space Availability:

Space Type	Total Area (hectares)	Per Capita (sq m)	Female Usage Rate (%)
Parks and Gardens	145.6	2.1	32%
Playgrounds	89.3	1.3	28%
Community Centers	23.7	0.3	45%
Libraries	8.9	0.1	38%
Religious Spaces	234.8	3.4	55%
Markets and Commercial	567.2	8.2	42%

Accessibility for Women with Special Needs:

Facility Type	Accessibility Rating	Coverage (%)
Ramps and Barrier-free Access	1.8/5	23%
Childcare Facilities	1.5/5	15%
Elderly-friendly Infrastructure	2.1/5	31%
Disabled-accessible Features	1.7/5	19%

Public Transportation Accessibility Analysis:

Area	Bus Route Density	Average Walking Distance to Stop	Service Frequency	Female Ridership (%)
Civil Lines	High (5-6 routes)	250m	8-12 minutes	42%
Chowk	High (4-5 routes)	300m	10-15 minutes	38%
Georgetown	Medium (3-4 routes)	400m	15-20 minutes	35%
Naini	Medium (2-3 routes)	450m	20-25 minutes	32%
Peripheral Areas	Low (1-2 routes)	600-800m	30-45 minutes	28%

The comparison reveals that infrastructure quality may be more important than infrastructure quantity in serving women's mobility needs. Kochi's limited but well-designed metro system serves women more effectively than Prayagraj's more extensive but poorly maintained bus system.

Investment levels in transportation infrastructure show significant disparities. Mumbai's massive investment in suburban railway systems, despite their limitations, provides extensive coverage that enables women's mobility across the metropolitan area. Kochi's strategic investment in metro infrastructure has created a high-quality system that effectively serves women users. Prayagraj's limited investment in transportation infrastructure creates fundamental constraints on women's mobility options.

6.1.3 Cultural and Social Context Differences

Cultural and social factors create different enabling or constraining environments for women's mobility across the three cities. These differences demonstrate how local contexts significantly influence the effectiveness of infrastructure and policy interventions.

Mumbai's cosmopolitan culture and diverse population create a more anonymous urban environment where traditional social restrictions may be less pronounced. This anonymity can provide freedom for women's mobility but may also reduce the informal social safety mechanisms that operate in smaller communities.

Kochi benefits from Kerala's progressive social attitudes toward women's education and participation. The state's cultural context provides greater social acceptance of women's mobility, but traditional expectations regarding appropriate behavior still influence patterns of public space utilization.

Prayagraj's cultural context, influenced by traditional values and religious significance, creates more pronounced social constraints on women's mobility. The concept of family honor and community reputation plays a stronger role in mobility decisions compared to the other cities.

Economic independence levels among women vary significantly across the cities, with Mumbai showing the highest levels of women's workforce participation, Kochi showing moderate levels supported by high education levels, and Prayagraj showing lower levels constrained by both economic opportunities and social factors.

Family structures and decision-making patterns show variations that influence women's mobility autonomy. Mumbai's nuclear family structures may provide greater individual autonomy but less family support. Kochi's family structures balance traditional support with progressive attitudes. Prayagraj's more traditional family structures may provide support but require more consultation and approval for mobility decisions.

6.1.4 Policy and Planning Approach Differences

The policy and planning approaches in the three cities reveal different strategies for addressing women's mobility and safety concerns. These differences provide insights into effective approaches and implementation challenges.

Mumbai's approach emphasizes large-scale, system-wide interventions that leverage economies of scale. The women-only train compartments and extensive CCTV networks represent

comprehensive approaches that benefit from the city's large user base. However, the complexity of coordination and implementation in such a large system creates challenges.

Kochi's approach focuses on integrated, high-quality interventions that may serve as models for other cities. The gender-sensitive design of the metro system and integrated planning approaches demonstrate how medium-sized cities can implement innovative solutions. The smaller scale allows for more experimental and responsive approaches.

Prayagraj's policy approaches remain fragmented and under-resourced, reflecting broader challenges in urban governance and resource allocation. The absence of comprehensive approaches to women's mobility results in ad-hoc interventions that may not address systemic issues effectively.

Institutional capacity varies significantly across the cities. Mumbai's complex institutional framework includes specialized agencies and extensive technical capacity but may suffer from coordination challenges. Kochi's institutional framework is more streamlined and may be more responsive to local needs. Prayagraj's institutional capacity limitations create fundamental constraints on policy development and implementation.

Community participation and stakeholder engagement show different patterns across the cities. Mumbai's large scale may limit meaningful community participation, while Kochi's smaller scale allows for more direct community engagement. Prayagraj's traditional social structures may both facilitate and constrain community participation in planning processes.

6.1.5 Lessons and Transferable Solutions

The comparative analysis reveals several lessons and potentially transferable solutions that could benefit women's mobility in Prayagraj. However, the transferability of solutions depends on local context adaptation and resource availability.

Infrastructure design principles from successful interventions in Mumbai and Kochi could be adapted to Prayagraj's context. The gender-sensitive design features of Kochi Metro, including adequate lighting, clear sight lines, and women-only spaces, could be incorporated into public transportation improvements in Prayagraj.

Technology applications, including mobile-based safety systems and electronic ticketing, have shown effectiveness in both Mumbai and Kochi but require adaptation to local technology penetration and user comfort levels in Prayagraj.

Community engagement approaches that have been successful in Kochi could be adapted to Prayagraj's context, taking advantage of traditional community structures while working to address restrictive social norms.

Integrated planning approaches that coordinate transportation, land use, and safety interventions show promise based on experiences in both comparison cities. However, implementing such approaches in Prayagraj would require strengthening institutional capacity and coordination mechanisms.

Phased implementation strategies that begin with high-impact, low-cost interventions could help build momentum and demonstrate effectiveness before pursuing more comprehensive solutions. Both Mumbai and Kochi have used such approaches effectively.

The importance of continuous monitoring and adaptation based on user feedback emerges as a critical lesson from both comparison cities. Establishing systems for ongoing evaluation and improvement is essential for long-term success.

Aspect	VIENNA, AUSTRIA	UMEÅ, SWEDEN	MUMBAI, INDIA	KOCHI, INDIA	PRAYAGRAJ, INDIA
DEMOGRAPHICS & BASIC DATA					
Population	1.9M (metro: 2.9M)	130K (metro: 230K)	12.4M (metro: 21M+)	680K (metro: 2.1M)	1.53M (metro: 1.49M)
Area (km²)	414.6	2,317	603	94.88	7,261
Sex Ratio	1,087♀:1,000♂	1,020♀:1,000♂	832♀:1,000♂	1,028♀:1,000♂	901♀:1,000♂
Literacy Rate	99%+	99%+	89.2%	95.7%	72.3%
Economic Status	High (€47K per capita)	High (€35K per capita)	Medium-High (Financial hub)	Medium (IT/Maritime hub)	Medium-Low (Religious center)
UNIQUE IDENTITY & CONTEXT					
Primary Identity	Cultural capital, Social housing pioneer	University town, Culture capital 2014	Financial capital, Entertainment hub	Port city, IT hub	Religious center, Administrative hub
Development Type	Developed European city	Small-medium Nordic city	Megacity, Economic powerhouse	Medium progressive city	Traditional heritage city
Cultural Context	Progressive social welfare, Gender equality tradition	Strong gender equality, Environmental consciousness	Cosmopolitan, Migration destination	Matrilineal heritage, High social indicators	Cultural/religious significance, Educational hub
GENDER-SENSITIVE PLANNING INITIATIVES					
Transport Initiatives	60+ gender mainstreaming initiatives, improved lighting, wider pavements, additional seating	Safety-focused infrastructure, tunnel near station replacing dark passages	Women-only train compartments, Pink Bus service, enhanced connectivity	Shakti program - free bus passes for women & transgender, Mo Bus integration	Opportunity: Heritage-sensitive transport with cultural safety elements

Housing & Spaces	Frauen-Werk-Stadt (women-designed housing), polycentric 15-minute neighborhoods	Frizon parks designed for/with teenage girls, gender-conscious public spaces	Improved public toilets, childcare facilities, safe recreational spaces	Gender-sensitive facilities integration in urban infrastructure	Potential: Religious site-integrated women-friendly spaces
Safety & Security	Comprehensive street lighting, accessible design, well-maintained infrastructure	Shift from dark passages to well-lit safe spaces, youth safety focus	CCTV, panic buttons, women security personnel, enhanced lighting	Community-based safety through women's networks, improved infrastructure	Need: Basic lighting, CCTV, community-based safety systems
Policy Integration	Gender budgeting since 2006, all budget proposals reviewed from gender perspective	Gender-mainstreamed citizen dialogue methods, systematic planning approaches	Technology-enabled safety platforms, institutional reforms	Gender-responsive budgeting, Kudumbashree integration in planning	Opportunity: Heritage-sensitive gender policy framework
Community Participation	High civic engagement, awareness through systematic programs	"Gendered Landscape" bus tours, citizen dialogue innovations	Limited but growing participation, women's group involvement	48 lakh women network through Kudumbashree, high community participation	Potential: Religious community networks for women's participation
ECONOMIC IMPACTS					
Workforce Participation	High women participation in formal economy	Gender-balanced workforce across sectors	Low 16% women workforce participation - intervention needed	2.23 lakh groups with ₹8,948 crores loans, 1+ lakh micro-enterprises	Gap: Limited formal sector participation, potential in religious tourism
Economic Empowerment	Strong social housing reducing costs, universal service access	Youth employment through inclusive planning, efficient services	Transport sector employment for women, improved job access	Significant community-based economic activity, sustainable livelihoods	Opportunity: Tourism-based women's employment, cultural economy

Cost Benefits	Universal access reduces household burden	Efficient public services, reduced transport costs	Reduced commuting time and costs for women	Free transport reducing household expenses, infrastructure savings	Potential: Reduced mobility costs, heritage economy benefits
SOCIAL IMPACTS					
Safety & Mobility	High safety perception, excellent mobility infrastructure	Safe gender-conscious public spaces, high accessibility	Improved but challenging due to megacity scale	Enhanced through community networks and infrastructure	Current: Traditional safety concerns, limited mobility options
Community Networks	Strong civic engagement, institutionalized participation	High community involvement, youth-focused programs	Limited but growing, technology-enabled reporting	Very high women's participation through organized networks	Status: Limited formal participation, strong informal networks
Service Access	Universal access to all urban services	Comprehensive service access, efficient delivery	Uneven access due to scale and inequality	Good access through community networks and state support	Gap: Basic services with significant gaps in coverage
CULTURAL IMPACTS					
Norm Change	Progressive gender norms are mainstream, pioneering approaches	Feminist urban planning integrated into mainstream practice	Gradual shift in mobility norms, metropolitan progressiveness	Despite good indicators, patriarchal norms persist, gradual change	Context: Traditional norms dominant, opportunity for culturally-rooted change
Identity Transformation	Pioneer in designing cities for women, international model	Gender equality as city brand, cultural leadership	Metropolitan progressiveness, financial hub identity	Balancing tradition with progress, community-led change	Potential: Religious center identity can support women's dignity
Intergenerational Effects	Strong intergenerational equality, systematic education	Youth-focused interventions, long-term cultural change	Mixed outcomes, varies by socioeconomic status	Positive but gradual change, education-driven progress	Opportunity: Educational institutions for awareness, cultural continuity

7: Policy Proposals for Enhancing Women's Mobility and Public Space Utilization in Prayagraj

7.1 Introduction

This chapter presents comprehensive policy recommendations for improving women's mobility and public space utilization in Prayagraj, drawing from successful international models in Vienna and Umeå, lessons from Indian case studies in Mumbai and Kochi, and specific local conditions in Prayagraj. The proposed policies aim to address safety concerns, improve accessibility, and create inclusive urban environments that support women's participation in public life.

7.2 Policy Framework: Gender Mainstreaming in Urban Planning

7.2.1 Institutional Framework

Based on Vienna's pioneering approach since 2000, Prayagraj should establish a dedicated Gender Mainstreaming Unit within the Prayagraj Development Authority (PDA) with the following mandate:

Establishment of Women's Urban Development Office

- Create a specialized unit headed by a qualified urban planner with gender expertise
- Allocate dedicated budget of ₹5 crores annually for gender-responsive urban initiatives
- Staff the unit with multidisciplinary professionals including urban planners, social scientists, and safety experts
- Establish direct reporting mechanism to the District Magistrate and Mayor

Policy Integration Mechanism

- Mandate gender impact assessments for all urban development projects above ₹1 crore
- Integrate gender considerations into the Master Plan 2031 revision process
- Establish inter-departmental coordination committee including representatives from PWD, Police, Health, Education, and Transport departments

7.2.2 Legal and Regulatory Framework

Amendment to Building Bye-laws

- Mandate gender-sensitive design guidelines for all commercial and residential complexes
- Require adequate lighting standards (minimum 20 lux) in parking areas and common spaces

- Prescribe minimum toilet facilities ratio of 1:3 (male:female) in public buildings and commercial establishments
- Mandate barrier-free design compliance for 100% of public infrastructure projects

Safety Regulations

- Establish mandatory CCTV coverage with 24/7 monitoring in all public spaces
- Create legal framework for regular safety audits of public spaces
- Implement penalty structure for non-compliance with gender-responsive design guidelines

7.3 Infrastructure Development Policies

7.3.1 Transportation Infrastructure

Public Transport Enhancement Drawing from Mumbai's experience with dedicated women's compartments and Kochi's integrated transport approach:

Bus Rapid Transit System (BRTS) with Gender Focus

- Reserve 30% seats for women in all city buses
- Install GPS tracking and panic buttons in all public transport vehicles
- Establish well-lit, secure bus stops with separate waiting areas for women
- Implement dynamic bus scheduling during evening hours (6 PM - 10 PM) with frequency of every 10 minutes on major routes

Non-Motorized Transport Infrastructure Following Umeå's inclusive mobility approach:

- Develop 200 km of dedicated cycling lanes by 2030 with proper lighting and surveillance
- Establish bicycle sharing system with 50% reservation for women during peak hours
- Create separate pedestrian pathways with minimum width of 3 meters on all arterial roads
- Install pedestrian crossings with audio signals at 500-meter intervals

Last-Mile Connectivity

- Deploy electric auto-rickshaws operated exclusively by women drivers
- Establish feeder services connecting residential areas to main transport corridors
- Create women-only taxi services with trained female drivers

7.3.2 Public Space Development

Neighborhood-Level Interventions Based on Vienna's successful neighborhood transformation model:

Parks and Recreation Spaces

- Redesign existing 45 parks in Prayagraj with gender-responsive features:

    - Improved lighting systems with LED fixtures providing minimum 50 lux illumination
    - Clear sightlines by strategic landscaping to eliminate blind spots
    - Multipurpose areas for different age groups and activities
    - Accessible toilet facilities with baby changing stations
- Establish 20 new pocket parks in high-density residential areas
- Create women-only exercise areas in 50% of city parks

Market and Commercial Area Upgrades

- Redesign traditional markets (sabzi mandis) with:
    - Covered walkways with adequate lighting
    - Separate vendor spaces for women entrepreneurs
    - Clean sanitation facilities with attendants
    - Designated parking areas for two-wheelers
- Establish women-only shopping hours (6 AM - 8 AM) in major markets

Community Centers and Social Infrastructure

- Establish 25 community centers in underserved areas with:
    - Childcare facilities for working mothers
    - Skill development and training programs
    - Health and counseling services
    - Safe spaces for women's group meetings

7.3.3 Housing and Neighborhood Design

Affordable Housing with Gender Lens Adapting Vienna's social housing model for Indian context:

Layout and Design Standards

- Mandate open space ratio of 40% in all residential developments
- Require community facilities within 500 meters of residential clusters
- Establish design guidelines ensuring natural surveillance and visibility
- Create dedicated spaces for home-based enterprises

Safety and Security Features

- Install motion-sensor lighting in all common areas
- Mandate intercom systems and visitor management in residential complexes
- Create neighborhood watch programs with 50% women participation
- Establish emergency response protocols with local police stations

7.4 Safety and Security Policies

7.4.1 Comprehensive Safety Framework

Technology-Enabled Safety Solutions

- Deploy city-wide CCTV network with 10,000 cameras by 2028
- Establish centralized command and control center with dedicated women's helpline
- Launch mobile safety app with features:
    - Real-time location sharing
    - Emergency alert system
    - Safe route navigation
    - Crowd-sourced safety reporting
- Install emergency call boxes at 200-meter intervals on major roads

Community Policing and Response

- Train 500 police personnel on gender-sensitive policing
- Establish 20 women-only police stations across the city
- Deploy mobile patrol units during evening hours in vulnerable areas
- Create rapid response teams with maximum 8-minute response time

7.4.2 Lighting and Surveillance Infrastructure

Street Lighting Enhancement Following successful models from Vienna and Umeå:

- Upgrade 50,000 existing street lights to LED systems by 2027
- Ensure continuous lighting on all pedestrian pathways and cycling tracks
- Install smart lighting systems with motion sensors in low-traffic areas
- Maintain illumination standards of minimum 30 lux on major roads and 20 lux on residential streets

Surveillance System Integration

- Integrate CCTV systems with AI-powered analytics for threat detection
- Establish live monitoring of high-risk areas during evening hours
- Create public access to safety information through digital displays
- Implement predictive policing using data analytics

7.5 Economic Empowerment and Livelihood Policies

7.5.1 Women's Economic Participation

Market Access and Entrepreneurship

- Reserve 30% of shops in new commercial developments for women entrepreneurs
- Establish women-only commercial complexes in 5 strategic locations
- Create dedicated vendor spaces for women in weekly markets
- Provide subsidized transportation for women vendors

Home-Based Enterprise Support

- Modify zoning regulations to permit home-based businesses in residential areas
- Establish collection and distribution centers for home-based products
- Create marketing platforms and e-commerce support for women entrepreneurs
- Provide skill development programs in high-demand sectors

7.5.2 Access to Services

Healthcare and Education Accessibility

- Establish mobile health clinics serving remote areas with female medical staff
- Create women-only timings in government hospitals and health centers
- Ensure all educational institutions have separate toilet facilities and safe transportation
- Provide scholarships and financial support for girls' higher education

Financial Services and Digital Inclusion

- Establish women-only banking hours in all public sector banks
- Create digital literacy programs targeting 50,000 women by 2030
- Provide subsidized smartphones and internet connectivity for women
- Establish micro-finance support for women's self-help groups

7.6 Implementation Strategy

7.6.1 Phased Implementation Plan

Phase I (2025-2027): Foundation Building

- Establish institutional framework and legal amendments
- Complete safety infrastructure in 30% of the city
- Launch pilot projects in 3 selected wards
- Conduct baseline survey and establish monitoring systems

Phase II (2027-2030): Scale-up and Expansion

- Extend infrastructure improvements to 70% of the city
- Launch economic empowerment programs at scale
- Implement technology solutions city-wide
- Conduct mid-term evaluation and policy adjustments

Phase III (2030-2035): Consolidation and Sustainability

- Achieve 100% coverage of safety infrastructure
- Establish self-sustaining financing mechanisms
- Replicate successful models in neighboring districts
- Conduct comprehensive impact assessment

7.6.2 Financial Framework

Budget Allocation and Resource Mobilization

- Total estimated investment: ₹2,500 crores over 10 years
- Central government funding: 40% through Smart Cities Mission and other schemes
- State government contribution: 30% through state urban development programs
- Municipal resources: 20% through property tax and development charges
- Private sector partnership: 10% through CSR and PPP models

Sector-wise Budget Distribution

- Transportation infrastructure: 35% (₹875 crores)
- Safety and security systems: 25% (₹625 crores)
- Public space development: 20% (₹500 crores)
- Housing and community facilities: 15% (₹375 crores)
- Institutional development and capacity building: 5% (₹125 crores)

7.6.3 Monitoring and Evaluation Framework

Key Performance Indicators

- Women's participation in public spaces: Increase by 40% by 2030
- Reported incidents of harassment: Reduce by 60% by 2030
- Women's economic participation: Increase formal employment by 50%
- Public transport usage by women: Increase by 45% during evening hours
- Women's access to digital services: Achieve 80% smartphone penetration

Data Collection and Analysis

- Conduct annual perception surveys with 5,000 women respondents
- Implement GPS-based mobility tracking studies
- Establish crime mapping and incident reporting systems
- Create real-time dashboard for policy monitoring
- Conduct independent third-party evaluations every two years

7.7 Stakeholder Engagement and Participation

7.7.1 Community Participation Framework

Women's Participation Mechanisms Drawing from Umeå's participatory approach:

- Establish Ward-level Women's Safety Committees
- Conduct regular "gendered landscape" tours for awareness building
- Create citizen advisory panels with 60% women representation
- Implement participatory budgeting for 20% of development funds

Multi-stakeholder Partnerships

- Engage civil society organizations and women's groups in policy design
- Establish partnerships with academic institutions for research and evaluation
- Create industry partnerships for employment and skill development
- Collaborate with media for awareness and behavior change campaigns

7.7.2 Capacity Building and Training

Professional Development Programs

- Train 200 urban planners and engineers in gender-responsive design
- Provide certification courses for 500 government officials

- Establish gender mainstreaming training for all new municipal recruits
- Create peer learning networks with other cities

Community Capacity Building

- Train 1,000 community leaders as gender equality champions
- Establish women's leadership development programs
- Create awareness campaigns reaching 5 million residents
- Develop local expertise in participatory planning methods

7.8 Innovation and Technology Integration

7.8.1 Smart City Solutions

Digital Infrastructure for Safety

- Deploy IoT sensors for real-time monitoring of public spaces
- Implement AI-powered video analytics for automated threat detection
- Create blockchain-based identity verification for secure service access
- Establish 5G connectivity for seamless communication and emergency response

Data-Driven Decision Making

- Develop predictive models for safety and mobility planning
- Create open data platforms for public access to safety information
- Implement big data analytics for transport optimization
- Use satellite imagery and GIS for spatial analysis and planning

7.8.2 Behavioral Change and Social Innovation

Awareness and Education Campaigns

- Launch multimedia campaigns on women's rights to public space
- Create interactive mobile exhibitions following Umeå's model
- Develop educational curricula on gender equality for schools
- Establish community theater and cultural programs

Social Innovation Pilots

- Test innovative solutions through living labs and pilot projects
- Support social enterprises addressing women's mobility challenges
- Create innovation challenges and hackathons for local solutions
- Establish partnerships with startups and technology companies

7.9 Sustainability and Long-term Vision

7.9.1 Environmental Sustainability

Green Infrastructure Integration

- Incorporate climate-resilient design in all infrastructure projects
- Promote sustainable transportation modes with dedicated infrastructure
- Create green corridors connecting parks and public spaces
- Implement rainwater harvesting and waste management systems

Carbon Neutral Mobility

- Transition to electric public transport fleet by 2035
- Promote cycling and walking through infrastructure development
- Establish renewable energy-powered street lighting
- Create carbon offset programs through urban forestry

7.9.2 Financial Sustainability

Revenue Generation Mechanisms

- Implement congestion pricing in central areas
- Generate revenue through advertising in improved public spaces
- Create social impact bonds for specific outcome-based programs
- Establish user fees for premium services and facilities

Cost Optimization Strategies

- Use standardized designs to reduce infrastructure costs
- Implement energy-efficient systems to reduce operational expenses
- Create maintenance partnerships with local communities
- Leverage technology for automated monitoring and maintenance

7.10 Conclusion and Recommendations

The policy framework presented in this chapter provides a comprehensive roadmap for transforming Prayagraj into a women-friendly city that ensures safety, accessibility, and economic opportunities for all women. The success of Vienna's gender mainstreaming approach since 2000 and Umeå's innovative gendered landscape methodology demonstrates that systematic policy interventions can create significant positive change in women's urban experiences.

Key Recommendations:

1. **Immediate Actions (2025-2026):**
    - Establish institutional framework and dedicated budget allocation
    - Launch pilot projects in 3 selected wards with highest women's population
    - Begin safety infrastructure upgrades in major public spaces and transport corridors
    - Conduct comprehensive baseline studies and stakeholder consultations
2. **Medium-term Priorities (2027-2030):**
    - Scale up successful interventions across the city
    - Implement technology solutions and smart city infrastructure
    - Launch economic empowerment programs and market access initiatives
    - Establish partnerships with private sector and civil society organizations
3. **Long-term Vision (2030-2035):**

- Achieve full integration of gender considerations in all urban policies
- Establish Prayagraj as a model city for women's safety and empowerment in India
- Create sustainable financing mechanisms for continued improvement
- Replicate successful models in other cities of Uttar Pradesh

The implementation of these policies requires strong political commitment, adequate financial resources, and sustained community engagement. With proper execution, Prayagraj can become a leading example of how Indian cities can create inclusive urban environments that support women's full participation in public life while preserving cultural values and promoting economic development.

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