

Examining the Travel Pattern and Behaviour of Women in Delhi

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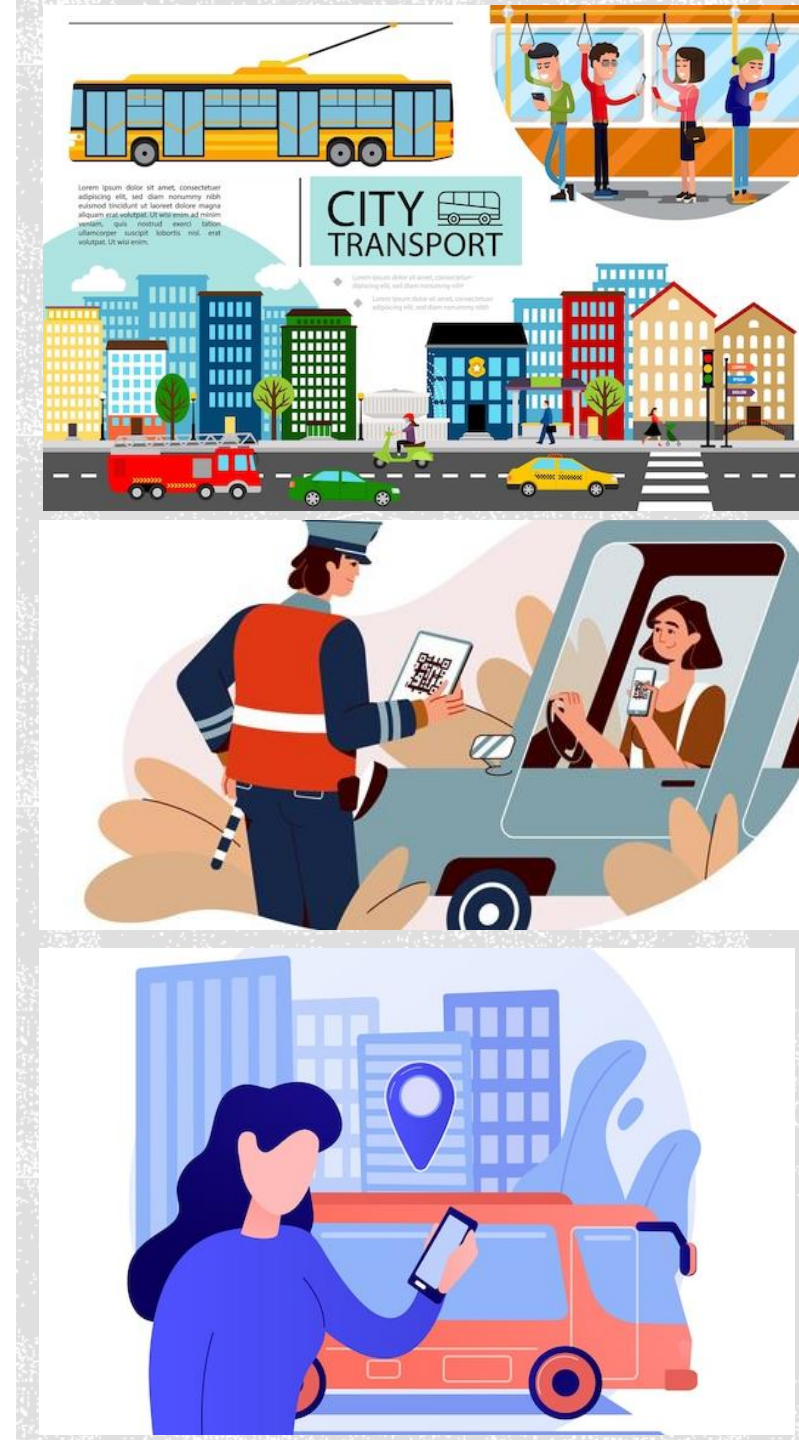


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Introduction

- Urban transport major role for citizens to access economic and social opportunities; gender as a key socio-demographic variable influences the travel behaviour, but often least understood
- Travel requirements and travel behaviour of women are distinct; more likely to consider factors such as safety, affordability, and comfort; eventually use low-carbon modes such as walking, cycling, or public transport
- However, public transport services are often inadequate and unreliable also poor NMT infrastructure
- Women and other gender minorities and differently abled people find their access to employment, education, healthcare, leisure, and public spaces constrained
- Vital to look at urban transport through a gender lens so that women do not bear disproportionate impacts



Literature Review

Gender inclusive transport linkages with Sustainable Development Goals




- While enhancing global transport opportunities, little consideration for women's requirements
- SDG 5 promotes gender equality, although there is no independent SDG for the gender inclusive mobility
- Linkages between the targets 3.6, 9.1, and 11.2

Sustainable Transport

- Compact city concept: short distance travel to minimise the negative impacts on both users and non-users such as lower exposure to air pollution and road accidents
- Short distances ideal for active transportation like walking and bicycling
- Public transport is land efficient and has high passenger carrying capacity

Gender Inclusive Mobility

- Mobility and gender two distinct yet interconnected issues; latter influences mobility choices
- Transportation allow for geographical mobility, also affects women's social mobility, improving their overall quality of life
- Transport policies biased against women as it does not take into account the unique demands of women

TARGET 3-6  REDUCE ROAD INJURIES AND DEATHS	ROAD SAFETY: By 2020, halve the number of global deaths and injuries from road traffic accidents
TARGET 9-1  DEVELOP SUSTAINABLE, RESILIENT AND INCLUSIVE INFRASTRUCTURES	SUSTAINABLE INFRASTRUCTURE: Develop quality, reliable, sustainable and resilient infrastructure, including regional and <u>transborder</u> infrastructure, to support economic development and human well-being, with a focus on affordable and equitable access for all.
TARGET 11-2  AFFORDABLE AND SUSTAINABLE TRANSPORT SYSTEMS	URBAN ACCESS: By 2030, provide access to safe, affordable, accessible and sustainable transport systems for all, improving road safety, notably by expanding public transport, with special attention to the needs of those in vulnerable situations, women, children, persons with disabilities and older persons.

Transport linkages with SDGs



Literature Review

Travelling pattern of women in Delhi

- Urban infrastructure such as Delhi Metro Rail Network and Delhi Transport Corporation buses constitute city mass transit network
- Last mile transport by interstate bus services, suburban trains, auto-rickshaws, cycle rickshaws, shared mobility, informal modes, NMT
- Metro rail laid groundwork for accessible and gender-sensitive mass transit; free ride initiative for women in buses launched with emphasis on women commuter's safety
- Women travel longer to commute to work by slower means of transportation because of other expensive personal modes and lack of access to family-owned vehicle; thus women work closer to their homes
- Women have inhibitions such as poor frequency, overcrowding, incidences of eve-teasing while commuting in Delhi
- Consequently, use informal modes of transportation to meet their transport needs including trip chaining, which develop as bottom-up responses to the gaps left by public transit system



Methodology

Objective of the survey

- To understand the **travel pattern** related to **travel mode, time, distance, and monthly expenses** along with the **household vehicle ownership pattern**.
- **For public transport users, last mile connectivity, accessibility, security, and connectivity of public transport** were also questioned to analyse the differences in travel pattern



Online survey was conducted to explore the different facets of travel pattern of commuters



Understanding the limitations of commuters, simultaneously an **offline survey** with the same questionnaire

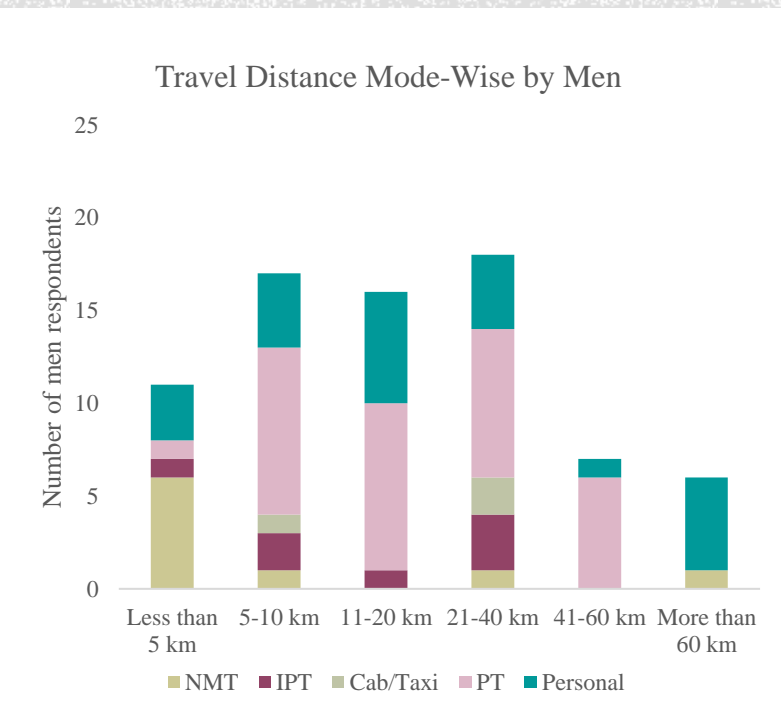
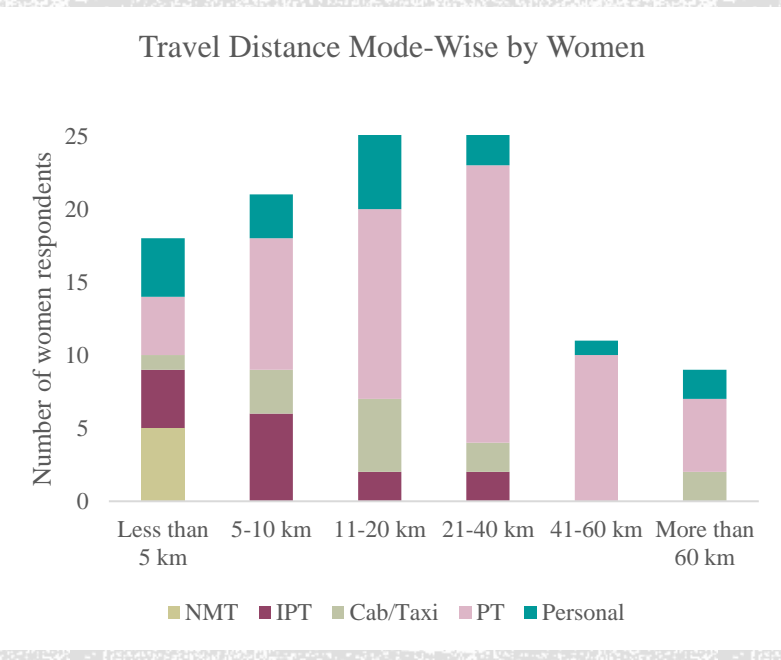


Total of **206 responses** was obtained, out of which **176** were online and **30** were on one-on-one basis (offline)

Results

a) General characteristics of travel distance mode-wise

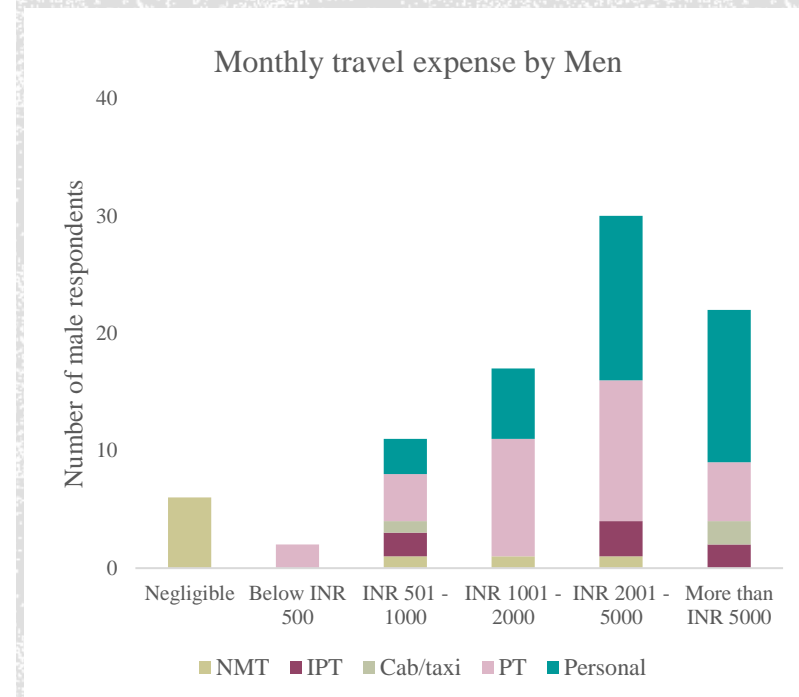
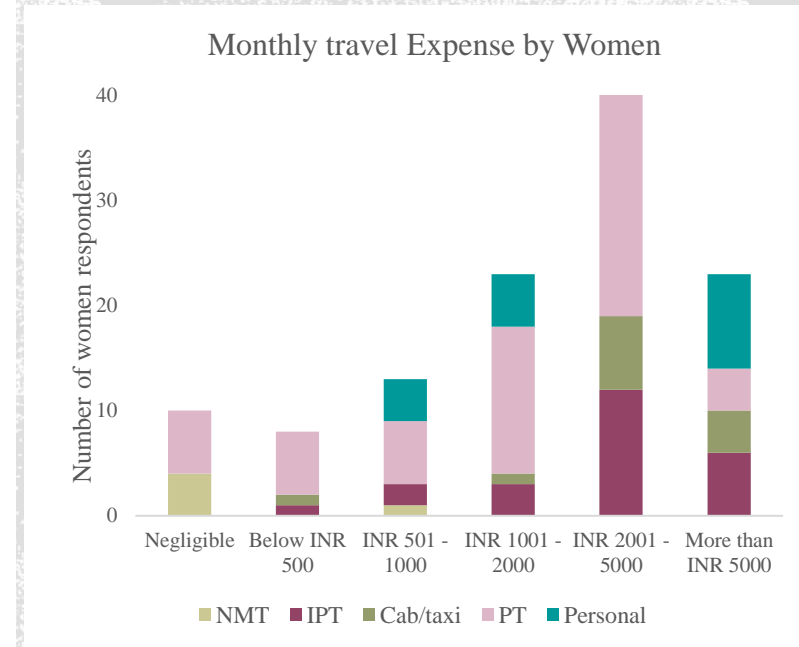
- Among NMT, female commuters depend only on walking for commutes of <5 km as stay near to places of work; beyond 5 km women do not prefer walking, mainly due to personal safety concerns
- Huge different travel behaviour of bicycles among men and women could be due to non-segregated lanes and preferred access to men of household vehicles
- Overall 65% of the public transport (PT) users are females as compared to 35% males.
- 42% of female respondents covered distances between 21-60 km for work and among them 74% used PT
- 8% survey respondents covered distances >60 kilometre among them 56% female used PT and 22% used personal transport whereas 83% male preferred personal transport as it provides seamless and comfortable trip; Personal transport is utilised by 65% of commuters who earn above INR 50,000 for longer trip distance and time
- 62% of women using PT travelled >1 hour in comparison to 45% of men; 51% men travelling for more than 1 hour use personal transport; could be due to lack of access to personal transport by women at the same time PT offering the required mobility especially for longer distances



Results

b) General characteristics of monthly travel expenses

- Cost of travel major factor for determining mode choice
- Commuters depending on NMT have negligible expense; 64% of NMT users earn below INR 30,000 these captive users with increasing incomes might shift to more carbon-intensive transport mode
- For female commuters walking or using bus services, the travel expenses were negligible
- 15% of total women have expenses below INR 500 as they utilize NMT or DTC buses as their primary mode on contrary, only 7% men have expenses below INR 500
- 20% female bus users incur expenses below INR 1,000 on account of motorised last mile connectivity
- Most of the cab/taxi users spend less than 1 hour on travel time however expenses are higher; spend on cab/ taxi giving priority to travel comfort
- With increasing incomes, commuters shift to personal motorised transport as they provide more comfortable and safe travel. Personal transport users i.e., 18% of total women and 43% of total men, incur the highest expenses in a month i.e., above INR 5,000/month



Results

c) Last-mile connectivity

- 73% of women and 79% of men change 2 – 3 modes while commuting by public transport and this inter-change between modes increases their travel time
- Difference in pattern between bus and metro, as 42% bus commuters changed only one mode on the contrary 15% commuters changed only one mode while commuting by metro

d) Preference for public transport

- 82 % of the non-users of public transport are willing to shift to public transport
- Accessibility to public transport within a comfortable distance is major factor to shift
- Other factors: improving safety, quality of transport service, awareness of low carbon intensive public transport
- Major factors hindering the shift: greater transit time of public transport and current distance from public transport stops >500 meters
- Other factors: overcrowding in public transport, high time consumption during peak hours especially from bus services even though buses provide high-capacity passenger service but does not get right of way, long waiting time for buses at stops

Number of modes changed by gender	1	2	3	4
Female	23	37	37	4
Male	21	55	24	0

Figure 3: Number of modes changed while using public transport (in percentage)

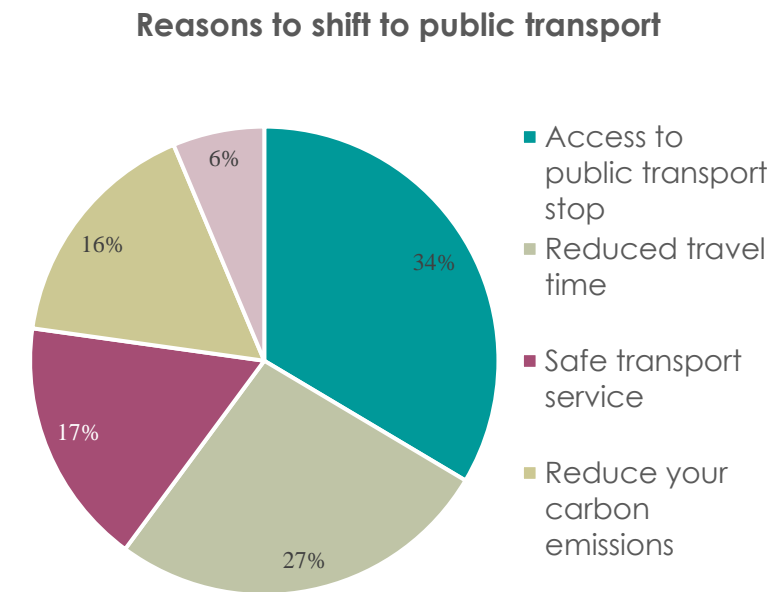


Figure 4: Reasons to shift to public transport

Results

e) Usage of personal vehicles by women

- 68% of women had a motorised vehicle in their household yet only 38% used the vehicle for daily commute
- Rest of 62% women, 43% of women cited unavailability of the vehicle due to usage by another family member, current on-road congestion deterred 39% of women, 31% women are not confident to drive, 24% women cited long distances between their source and destination
- Overall low usage of motorised vehicle by women



Conclusion

- To encourage NMT as a primary mode as well as for last mile connectivity for women, segregated infrastructure such as proper footpaths, dedicated lanes, and streetlighting are important
 - Women perceive adequate lighting on footpaths and at public transport stops as a measure of security and can opt for motorised modes especially IPT in absence of adequate infrastructure
 - Current captive users of NMT usage are mostly commuters with monthly earnings below INR 30,000 and should to be retained
 - Surveyed cyclists mentioned accidents while commuting in the same lane along with heavy motorised traffic
- Rationalize routes of buses with point-to-point services for short routes which will save travel time and expense of commuters
 - High waiting time at stops causing the overall travel time to be high
 - Women considering safety in overcrowded buses, wait for longer at bus stops which also result in overall travel time to be higher
 - Female respondents highlighted concern that bus drivers avoid stoppage at stops where only a group of women are waiting because they would avail free services
- Public transport has high occupancy ratio yet utilise same lanes as single-occupant personal transport, therefore, dedicated bus lanes should be taken up to reduce the time for PT commuters
- Innovative use of Information and Communications Technology (ICT) to report harassment and improve access to information and gender sensitization training for transport staff should be encouraged
 - Safety instruments such as CCTV cameras or panic buttons are often not working, harassment by other commuters and lack of cleanliness
- Seamless inter-modal connectivity is required at metro stations; intermodal connectivity especially for fixed route services such as metro and buses need to be planned for smooth transfer
- Dedicated lanes for IPT as near as possible to metro stations to provide a smooth and secure last mile or public bus as a shuttle service option
- At large, more women in transport authorities, community involvement in public transport project design, implementation, and monitoring, and relevant communication campaigns can steer the changes towards gender-inclusive mobility



References

1. Anand, A., & Tiwari, G. (2006). A gendered perspective of the shelter–transport–livelihood link: the case of poor women in Delhi. *Transport Reviews*, 26(1), 63-80.
2. Bamberger, M., Lebo, J., Gwilliam, K., & Gannon, C. (1999). Gender and transport: A rationale for action. PREM Notes, Number 14, January 1999. (Washington, D.C.: The World Bank).
3. Deb, K. (2002). Restructuring Urban Public Transport in India. *Journal of Public Transportation*, 5(3).
4. Gera, K., & Hasdell, P. (2020). The context and experience of mobility among urban marginalized women in New Delhi, India.
5. Ghate, A. T., & Sundar, S. (2013). Can we reduce the rate of growth of car ownership?. *Economic and Political Weekly*, 32-40.
6. Government of NCT of Delhi. 2021. Economic Survey of Delhi, 2020–2021. Planning Department.
7. Grieco, M. and Turner, J. 1997, Gender Poverty and Transport, UN International Forum on Urban Poverty (HABITAT), Florence.
8. Kapoor, A. (2021). *Municipal Performance Index 2020*. New Delhi and Gurugram: Institute for Competitiveness and Ministry of Housing and Urban Affairs.
9. Mahadevia, D. (2015). *Promoting Low Carbon Transport in India*. United Nations Environment Programme (UNEP) DTU Partnership.
10. Ministry of Road Transport and Highways. (2023). *Road Transport Year Book (2019-20)*. New Delhi: Ministry of Road Transport and Highways, Government of India.
11. NUTP, M. (2014). National Urban Transport Policy. *Government of India*.
12. Ollivier, G., Nikore, M., & Natasha, S. (2022). *Toolkit for Enabling Gender Responsive Urban Mobility and Public Spaces India; Volume I: The ‘What-To-Do’ Note for Policymakers*. Washington, DC.: World Bank.
13. Paul, A. (2023). Promoting Gender-Inclusive Mobility.
14. Prakash, S., & Qamar, S. (2022). *Clean Transport in India*. New Delhi: TERI Alumni Association.
15. Sadana, R. 2010. On the Delhi Metro: An Ethnographic View. *Economic and Political Weekly*, 77–83.
16. Sengar, S. 2019. Delhi Govt Claims Free Public Transport For Women Will Ensure Safety, Will It Really Help? India Times. June 4.
17. Siemiatycki, M. (2006). Implications of private-public partnerships on the development of urban public transit infrastructure: The case of Vancouver, Canada. *Journal of Planning Education and Research*, 26(2), 137-151.
18. Singhai, A., & Singhai, K. (2021). Gender, Inclusive Transport and Sustainable Development Goals: A Legal Perspective to Transport Policies. *Transport and Communications Bulletin for Asia and the Pacific*, 91, 58-71.
19. Sundar, S., (2018). Inclusivity, Gender, and Safety in mobility. *The Energy and Resources Institute*.
20. Tarei, P. K., Chand, P., & Gupta, H. (2021). Barriers to the adoption of electric vehicles: Evidence from India. *Journal of Cleaner Production*, 291, 125847.
21. Tayal, D., & Mehta, A. K. (2021). Working women, Delhi Metro and Covid-19: a case study in Delhi-NCR. *The Indian Journal of Labour Economics*, 64(2), 389-413.
22. Tiwari, G., & Nishant. (2018). *Travel to Work in India: Current Patterns and Future Concerns*. New Delhi: Transport Research & Injury Prevention Programme, Indian Institute of Technology Delhi.
23. Turdalieva, C., & Edling, C. (2018). Women’s mobility and ‘transport-related social exclusion’ in Bishkek. *Mobilities*, 13(4), 535-550.
24. World Bank. (2004). *Gender and development in the Middle East and North Africa: Women in the public sphere*. The World Bank.

