



# Constraints to Women's Use of Public Transport in Developing Countries, Part I: High Costs, Limited Access, and Lack of Comfort

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This Brief, the first in a two-part series, provides an overview of the evidence on key features of women's travel behavior and the barriers they face in accessing public transport in developing countries, including affordability, frequency, coverage, and comfort (also see Borker 2022, which focuses on safety issues). Women make more frequent, shorter trips with more stops along the way to combine multiple tasks. In contrast, men follow direct and linear routes. These patterns have important implications. As this Brief shows, the cost and frequency of public transport affect women more than men, and given women's income constraints, create trade-offs between travel and other economic opportunities. This Brief also highlights how the current design of public transport does not accommodate the unique needs of women. Notably, coverage issues such as a poorly connected network, including last mile problems, limit women's use of public transport and increase their reliance on private and informal modes of transport. Infrastructure design does not prioritize women's comfort. Understanding the evidence on the challenges faced by women is a first step in identifying policies and interventions that could improve women's accessibility.

## Women and men have different mobility needs and travel patterns

Transport is key to promoting development, access to essential services and social support networks, and economic opportunity. With cities expected to contain more than 5.2 billion people by 2050 (UN 2018), there is a strong case for developing sustainable and equitable urban transport. One crucial component of this process is developing transport that serves women's mobility needs given that women and men travel differently.

In developing countries, women make frequent, shorter trips with more stops, while men follow more direct and linear patterns (Gonzalez et al. 2020). This difference partly reflects sociocultural norms and women's existing roles in the household and economy. Men care more about commute duration and affordability—perhaps because they make more work-related trips and have higher incomes (Carvajal and Alam 2018; Gauvin et al. 2020), while women rank infrastructure quality and service frequency as major barriers to public transport (Soman et al. Ganesan 2019). Women engage in more travel that is not related to paid employment to cater to household duties, caregiving and economic responsibilities (CIVITAS 2014). Women share similar roles across developing and developed countries. For instance, in Bogotá, women undertake 75 percent of care trips and 42 percent of work trips. Similarly, women carry out more than 70 percent of the unpaid work in countries like Ireland, Italy and Portugal (Vaalavuo 2016). Women also

consider comfort to be an important factor affecting their travel because they are more likely to “trip chain,” combining multiple tasks and destinations in one trip (Allen et al. 2016) and to be accompanied by children and the elderly (Duchène 2011). Buying numerous single-fare tickets during chained trips makes public transport costlier for women (Shah et al. 2017), which affects the distance they cover (Uteng and Turner 2019).

Women constitute a lower proportion of travelers in public transport but when they do travel, they are more dependent on public transport than men. Expensive multistop trips and more limited access to financial resources increase women's reliance on public transport (Gonzalez et al. 2020). In India, two-thirds of female workers in urban areas commute for work, and among women who travel, a higher proportion (67 percent) than men (41 percent) walk and use buses (Tiwari and Singh 2018). In Lima and Buenos Aires, women use public transport more than men: 58 percent of women compared to 54 percent of men in Lima and 50 percent of women compared to 37 percent men in Buenos Aires (Gonzalez et al. 2020).

Mobility issues are similar across urban and rural regions, while the consequences are worse in rural areas (Gauvin et al. 2020). Women across urban and rural areas have inferior access to privatized transport modes than men (Peters 2013). Sixty percent of women in India rely on buses as their primary transport mode, followed by informal or nonmotorized modes (Shah et al. 2017). Nonmotorized modes (such as bicycles and rickshaws) and paratransit (such as electric rickshaws) play a

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substantial role in women's access to employment and other opportunities (Uteng and Turner 2019). Ninety-three percent of female garment workers in Dhaka walk or use informal paratransit modes like manually pedaled cycle-rickshaws for their work commute (Sikdar et al. 2014). In rural regions, however, women's limited access reduces their health and economic outcomes, especially in time-sensitive cases like childbirth. In fact, a 10 percent increase in distance from a hospital is associated with a 2 percent increase in the mortality rate (Uteng and Turner 2019). Women also have lower access to automobile-based trips in rural regions than in urban areas due to constraints on availability and income (Adeel 2016).

Transport infrastructure in most countries is designed to cater to typical commute journeys, characterized by linear, uninterrupted travel between home and the central business district (CBD). This pattern tends to disfavor women (Allen et al. 2016; Gonzalez et al. 2020). To address women's complex travel needs, transport design must be gender-aware and serve both linear and nonlinear travel. Women need connections to diverse locations beyond the CBD (Shah et al. 2017), and vehicles with ample luggage space, suitable for shopping and buggies. Traveling by public transport goes beyond the transit itself and includes walking and waiting (Allen, Vanderschuren, and the University of Cape Town 2016). To improve women's access to public transport, stations, stops, and vehicles must be barrier-free, safe, and well lit (Peters 2013). Investments are needed in even walkways, easier road crossings, and gender-balanced public signage.

The efficiency of a transportation system, defined by its coverage, flexibility, and comfort, shapes women's mobility and economic opportunities (Aloul et al. 2019; IFC et al. 2018; Tilley and Houston 2016). An increase in bus service has been shown to increase women's nonfarm employment by 23 percent in India's rural regions between 2005 and 2012 (Lei et al. 2019). Women in developing countries travel longer than men and are more dependent on paratransit due to the lack of reliable transport services (Lecompte and Bocajero 2017; Peters 2013). Women also depend on factors like cleanliness, availability of shelter at bus stops, reliable information systems, and helpfulness of personnel to have a comfortable trip (Márquez et al. 2014).

This policy Brief reviews the evidence on four key constraints to women's mobility—affordability, coverage, frequency, and comfort. It provides an overview of the nature of each of these constraints, the factors driving them, and their impact on women's mobility. Together with transport safety constraints (see also Borker 2022), these constraints align closely with the widely used 4A's framework of adequacy of transport that is centered around four attributes: affordability, availability, accessibility, and acceptability (de Avila Gomide et al. 2005). Within the "A" of affordability, the Brief discusses direct monetary costs, indirect nonmonetary costs, and the opportunity costs to travel. Within the "A" of availability, it discusses coverage and frequency. Within the "A's" of accessibility and acceptability, it discusses comfort. The discussion focuses on urban regions in developing countries, considering the fast-paced urbanization in the developing world (EC 2020). However, many challenges women face in urban settings in developing countries also apply to rural settings and developed countries. The constraints discussed have broader implications that can be considered by all transport planners.

## Cost of public transport constrains women's mobility and access to economic opportunities

Affordability of transport refers to households' ability to spend on transportation while being able to access basic goods and complete daily chores (Dewita et al. 2020; Fan and Huang 2011; Litman 2020). It is a key concern in transport use because families across developing countries spend 10 percent to 20 percent of their income on direct transport costs (Allen et al. 2016; Gómez-Lobo 2011; Statista 2018). Poorer households

spend a higher proportion of their income on transport because they are less likely to own a private vehicle and more dependent on public transport (Baker et al. 2005; Dewita et al. 2020; Gwilliam 2017; Lucas 2010). Transit also implies intangible costs like the time spent and potential consumption sacrificed to meet expenses (Gonzalez et al. 2020). Another important determinant of how economical public transport is for passengers is the built environment, consisting of the physical parts of where people live and work such as homes, buildings, streets, open spaces, and infrastructure (Centers for Disease Control and Prevention 2011). Features such as the size of cities, the characteristics of the passenger transport system, demographic trends, and sociocultural norms also affect transport costs (Diaz Olvera et al. 2008).

The cost of transport affects women more than men (Dodson et al. 2004). Women spend a higher share of their income on public transport than men (Lecompte and Bocajero 2017). They make more multistop trips, carry additional luggage, and are often accompanied by children and the elderly; this forces them to rely on more expensive choices like rickshaws or taxis, which provide the flexibility and space required (Mejía-Dorantes and Villagrán 2019). Costly public transport and lack of access to household vehicles also forces women to spend more on complementary and informal transport modes (Dodson et al. 2004; Gonzalez et al. 2020; Priye and Manoj 2020).

Beyond travel, commuting costs affect women's housing decisions. Facing a trade-off between affording rent or travel, women forgo economic opportunities outside their neighborhood if transport options seem expensive. For instance, women's employment rate declined by 26 percent following a large-scale resettlement in Delhi (Abebe et al. 2017; Kunieda and Gauthier 2007; Munshi 2016).

Transport costs disproportionately constrain lower-income individuals because they affect access to economic opportunities and public spaces. Most low-income women walk or take nonmotorized transport for daily travels. In India, walking is the only viable transport mode for 87 percent of low-income women. To cover longer distances, low-income women substitute time for money, while higher-income women prioritize comfort over cost (Arroyo-Arroyo and Diallo 2020). Public transport pricing essentially creates an affordability trap for women. The high cost of traveling to the city center reduces employment avenues and market access for women (Tracey-White 2005). An inability to access viable options severely impacts women's living conditions and capacity to save (Uteng and Turner 2019). This inequality creates a vicious circle, whereby the lack of public transport reduces women's avenues to earn, and in turn makes transport unaffordable. Sixty percent of women in the Middle East and North Africa believe the lack of transportation reduces their economic choices (Aloul, et al. 2019; Dodson et al. 2004).

## Inadequate transport coverage perpetuates the gender gap in mobility

The last mile of travel poses a significant constraint (Lenormand et al. 2020) due to inadequate connectivity between transit stops and the final trip destination (Tilahun and Li 2015). Last mile connectivity includes access to provisions like pedestrian walkways, bikeways, transit connections, and paratransit options. Their availability depends on the built environment where the last-mile trip takes place. This includes factors such as neighborhood design and distance from public transport that affect commuters' modal choice and travelling time (Fan and Huang 2011). For instance, the presence of pedestrian and cycle infrastructure increases walking/bicycle use (Munshi 2016).

Last mile connectivity affects women's access to transport, work, and a safe environment. Women with better connectivity or those who live closer to the center have more job opportunities and better access to those opportunities. For instance, better access to public transport allowed women in central zones in Chennai, India, to make 40 percent

longer work trips than those in the periphery, opening more job avenues for them. Moreover, women considered access to buses to be an essential factor while choosing a workplace in Chennai (Alberst et al. Baudi 2015; Srinivasan 2005). Evidence from Pakistan has shown a monotonic relationship between the distance to the final destination and the money and time costs. Each additional kilometer between the mass transit stops and end destination increases travel cost by 3.2 cents and travel time by 3.6 minutes (Field et al. 2020). Along with cost, women face safety concerns in the absence of adequate connectivity. This issue is discussed in greater detail in the companion Brief (Borker 2022). Lack of transit stations and appropriate infrastructures such as streetlights and sidewalks further impede women’s ability to travel through these connectivity gaps (Tilahun and Li 2015).

Last mile coverage is also a key determinant of public transport access among the disabled. To access public transport, disabled commuters rely on special services such as the feeder system (private or public means of transport used to reach the nearest public transport stop, including small-scale, demand-driven mobility services like taxi-buses or carpooling), as well as “dial-a-ride” and door-to-door services in adapted accessible vehicles. While upper-middle-income countries such as Brazil and South Africa have taken measures to address the needs of disabled travelers, such initiatives have found only limited application in low-income countries (Kett et al. 2020). A key issue for disabled commuters is the poor condition of amenities, especially terminal facilities including inadequate shelter against weather conditions, insufficient lighting, inappropriate entrances/exits, uncomfortable seats, inadequate toilets for wheelchair users, and poor security arrangements for female travelers (Kett et al. 2020). Disabled women are further at risk as they are more often subject to sexual crime and harassment. Inaccessible transport systems increase the fear of victimization and limit their access to work, education, and social activities (Iudici et al. 2017). Many countries lack adequate travel amenities for disabled women. In Pakistan, 92 percent of disabled women rated existing terminal facilities as “poor” and “very poor” when asked about the amenities (Ahmad 2015). Moreover, 60 percent of respondents in a Bangladesh survey reported they could not use buses because of overcrowding and inaccessibility for users with wheelchairs or crutches (Aker and Rahman 2019).

The absence of a well-connected public transport system and the missing feeder system increases dependence on private or informal transport modes. The proportion of trips made by public transport (50.2 percent) in India is 10 percent less than the desired range, as identified by a review of urban transport in India (Singh 2005), while the share of trips made by private vehicles (33.9 percent) is 18 percent higher than this range (Dev and Yedla 2015). Women who lack funds or access to a personal vehicle and who are underserved by mainstream transit systems opt for informal paratransit options (Priye and Manoj 2020). They use minibuses, shared taxis, nonmotorized vehicles, and walking for the first and final phases of their journey. Places with poor pedestrian infrastructure increase the need for other paratransit options. In Manila, the lack of pedestrian infrastructure has forced people to use paratransit-like jeepneys and motorized cars even for trips that could be accomplished by a 15-minute walk (Mateo-Babiano 2015; Walton and Sunseri 2010). For women choosing paratransit options, considerations like comfort, reliability, and driver attitude are paramount and they are willing to pay a premium for it (Basu et al. 2017; Fillone and Mateo-Babiano 2018; Ghani et al. 2007). Such paratransit modes increase users’ safety concerns and financial costs (Borker 2022; Cervero 2013). These informal transport modes also create intangible costs by increasing traffic congestion and emission of harmful pollutants (Fried and Abubaker 2019; Kumar et al. 2016).

## The low frequency of public transport when women travel limits their use

Waiting times affect women’s choice of transport modes and routes (Chowdhury and Wee 2020). Because they often combine economic

and household work, women have less free time and higher trip frequencies than men (Duchène 2011). Nonworking women in Buenos Aires make more trips in a day than their male counterparts because they are more likely to take care of school runs, household errands, and social visits (Gonzalez et al. 2020). Similarly, women in Chennai make all trips to fetch water, 85 percent of drop-off trips, and 76 percent of grocery trips (Srinivasan 2005). Women’s responsibilities make them time-poor and affect their trip patterns. To cater to multiple responsibilities, women “trip chain” and fulfill several activities within one journey. A higher frequency of transport reduces their wait and allows them to cover several destinations. This is particularly important for women who live on the periphery of cities and spend hours commuting to the center (Khosla 2009; Uteng and Turner 2019).

Unreliable and infrequent public transport falls short in serving women’s needs. Public transport either does not serve internal routes within communities or is available only at limited times (Gonzalez et al. 2020). Around half of women commuters in India believe public transport is unreliable due to its erratic schedule during nonpeak hours (Shah and Raman 2019). Bus services that tend to not show up, be late, or fail to stop for riders exacerbate the problem (Higgins 2019; Pojani and Stead 2015). Bus passengers in India face an average waiting time of 12 minutes, which is double that of informal modes like shared auto rickshaws, regardless of the time of the day (Roy and Basu 2020).

The low frequency of public transport is an outcome of transport authorities’ financial constraints and the focus on catering to male-centric travel. Peripheral regions of cities usually have dispersed settlements of low-income communities (Libertun de Duren 2018). Their inhabitants, while dependent on cheap public transport for connectivity, do not create enough traffic to justify investment in cheap and frequent public transport (UN-Habitat 2003). The lower frequency of transport reduces the number of trips that can be made in a day. Individuals living in the center of Chennai are almost 40 percent more likely to make two or fewer trips a day, compared to those living in the periphery (Srinivasan 2005). Another cause for the dip in frequency is the disregard in transport planning for off-peak-hour traffic. The planning based on male-centric linear travel patterns does not value women’s trips to cater to household responsibilities. For instance, women in Turkmenistan have longer waiting times and 10 percent to 15 percent more average total journey time than men (Kunieda and Gauthier 2007). Cost cutting exercises inevitably involve a reduction in off-peak services (Khosla 2009).

Long waiting times can have serious implications for women. Besides safety concerns while waiting for transport (Borker 2022; Shah et al. 2017), long waiting times have a financial cost because they directly affect people’s working hours and salaries. A study based in Jordan showed that the waiting cost for public transport users is 12 percent more during non-peak hours than during peak hours, and with women traveling most during non-peak hours, they disproportionately bear this higher cost. Moreover, the average cost of waiting time is higher for buses (which have nominally lower fares) than minibuses and taxis (Shtayat et al. 2019).

## Public transport is not designed to cater to the comfort of women travelers

International standards define rider comfort as usability of facilities, ambient conditions, complementary facilities, and ergonomics (Imre and Çelebi 2017). Travel comfort, as per urban mobility experts, contributes more to making a convenient trip than a better ticketing system, electronic services, and intermodality (Knapfer et al. 2018). Public transport in developing countries, however, often does not address women’s comfort needs. Three-fourths of riders in India and 67 percent in Mexico City perceive public transport to be uncomfortable (Sánchez-Atondo et al. 2020; Shah and Raman 2019). Crowding, unscheduled variabilities in transportation time, and ventilation problems contribute to making public transport an undesirable option

(Imre and Çelebi 2017). For women, vehicles' design and the way they are driven makes public transport especially inconvenient (Mahadevia 2015).

The comfort of a travel mode affects women's travel decisions. Forty-five percent of women in India consider comfort to be a barrier while using public transport (Soman, Kaur, and Ganesan 2019). The current design of public transport does not accommodate women's unique needs. For instance, the height of entry and exit steps and absence of hold rails create problems for women in a traditional everyday dress like sarees (Bhatt et al. 2015; Mahadevia 2015). Women's comfort also lies in being able to travel with children and/or luggage, which is why women are more likely to use elevators and escalators while traveling (Metro 2019). In India, women's travel comfort also depends on having better pedestrian infrastructure and on the walking environment, as 40 to 60 percent of trips are made by walking (Bivina and Parida 2020).

Factors such as transport flexibility, reliability, and privacy also contribute to women's comfort. Transport flexibility is an important consideration for women given their complicated travel patterns (Bray and Holyoak 2015). Considering time scarcity and safety concerns, women prefer predictable transport modes like cars and paratransit, which help them conduct complex trips spread across space and time (Ng and Acker 2018). Women also tend to value transparent bus shelters for better visibility and lighting (Perez 2019; see also Borker 2022).

## Conclusion

Public transport shapes how, when, and where most women travel. The need to make complex trips and fulfil multiple responsibilities during their daily activities makes all travel costly for women not only in terms of the time it takes but also in the associated monetary costs. Unreliable and infrequent public transport imposes a disproportionately higher burden on women than on men, affecting their access to education, health care, jobs, and markets. Women's inability to actively participate in daily activities influences their role in the global economy and concomitantly has long-term consequences for economic growth.

This Brief examines how women's take-up and usage of public transport is affected by constraints related to affordability, coverage, frequency, and comfort. Women spend a higher share of their income on public transport than men, and the interaction of income constraints that bind more for women makes the cost of public transport a key constraint for them. Women face the majority of the costs associated with limited last mile connectivity, making them more dependent on paratransit options that are usually unsafe and relatively costly. Women seek transport options that provide frequent and reliable travel because of their time constraints and safety considerations. Women's travel decisions also rely on the level of comfort and convenience that public transport provides.

## References

- Abebe, G. T., S. Caria, M. Fafchamps, P. Falco, S. Franklin, S. Quinn, and F. Shilpi. 2017. "Job Fairs: Matching Firms and Workers in a Field Experiment in Ethiopia." Policy Research Working Paper, 8092, World Bank, Washington, DC.
- Adeel, M. 2016. "Gender Inequality in Mobility and Mode Choice in Pakistan." *Transportation* 44 (6): 1519–34.
- Ahmad, M. 2015. "Independent-Mobility Rights and the State of Public Transport Accessibility for Disabled People: Evidence from Southern Punjab in Pakistan." *Administration & Society* 47 (2): 197–213.
- Akter, A., and M. Rahman. 2019. "Women with Disabilities in Bangladesh: Accessibility in the Built Environment." *Proshikhyan, A Journal of Training and Development* 26 (2): 1–12.
- Alberst, A., K. Pfeffer, and I. Baudi. 2015. "Rebuilding Women's Livelihoods Strategies at the City Fringe: Agency, Spatial Practices, and Access to Transportation from Semmencherry, Chennai." *Journal of Transport Geography* 55 (July): 142–51.
- Allen, H., M. Vanderschuren, and the University of Cape Town. 2016. "Safe and Sound: International Research on Women's Personal Safety on Public Transport." FIA Foundation Research Series, Paper 6, FIA Foundation, London.
- Aloul, S., R. Naffa, and M. Mansour. 2019. "Gender in Public Transportation: A Perspective of Women Users of Public Transportation." Friedrich-Ebert-Stiftung. Jordan & Iraq. [www.fes-jordan.org](http://www.fes-jordan.org).
- Arroyo-Arroyo, F., and B. Diallo. 2020. "Invisible Travelers": 3 Lessons from Freetown to Transform Urban Transport—and Your City." World Bank blog, February 27, 2020. <https://blogs.worldbank.org/ppps/invisible-travelers-3-lessons-freetown-transform-urban-transport-and-your-city>.
- Baker, J., R. Basu, M. Cropper, S. Lall, and A. Takeuchi. 2005. "Urban Poverty and Transport: The Case of Mumbai." Policy Research Working Paper 3693, World Bank, Washington, DC.
- Basu, R., V. Varghese, and A. Jana. 2017. "Comparison of Traditional and Emerging Paratransit Services in Indian Metropolises with Dissimilar Service Delivery Structures." *Asian Transport Studies* 4 (3): 518–35.
- Bhatt, A., R. Menon, and A. Khan. 2015. "Women's Safety in Public Transport: A Pilot Initiative in Bhopal." WRI Ross Center for Sustainable Cities, World Resources Institute, Washington, DC.
- Bivina, G. R., and M. Parida. 2020. "Prioritizing Pedestrian Needs Using a Multi-criteria Decision Approach for a Sustainable Built Environment in the Indian Context." *Environment, Development and Sustainability* 22 (5): 4929–50.
- Borker, G. 2022. "Constraints to Women's Use of Public Transport in Developing Countries II: Safety." Research & Policy Briefs No. 10, World Bank Group, Washington, DC.
- Bray, D., and N. Holyoak. 2015. "Motorcycles in Developing Asian Cities: A Case Study of Hanoi." In *37th Australasian Transport Research Forum*, unpublished conference paper.
- Carvajal, G. K., and M. M. Alam. 2018. "Transport Is Not Gender-Neutral." World Bank blog, January 24, 2018. <https://blogs.worldbank.org/transport/transport-not-gender-neutral>.
- Centers for Disease Control and Prevention. 2011. "Impact of the Built Environment on Health." *Fact Sheet Series*, June 2011. <https://www.cdc.gov/nceh/publications/factsheets/impactofthebuiltinvironmentonhealth.pdf>.
- Cervero, R. 2013. "Linking Urban Transport and Land Use in Developing Countries." *Journal of Transport and Land Use* 6 (1): 7–24.
- Chowdhury, S., and B. Van Wee. 2020. "Examining Women's Perception of Safety during Waiting Times at Public Transport Terminals." *Transport Policy* 94: 102–08.
- CIVITAS. 2014. "Smart Choices for Cities: Gender Equality and Mobility, Mind the Gap!" Policy Note. CIVITAS. [https://civitas.eu/sites/default/files/civ\\_pol-an2\\_m\\_web.pdf](https://civitas.eu/sites/default/files/civ_pol-an2_m_web.pdf).
- de Avila Gomide, A., S. K. Leite, and J. M. Rebelo. 2005. "Public Transport and Urban Poverty: A Synthetic Index of Adequate Service." In *Competition and Ownership in Land Passenger Transport*. 9th International Conference (Thredbo 9). Lisbon.
- Dev, S. M., & Yedla, S. 2015. *Cities and Sustainability*. Springer, India.
- Dewita, Y., M. Burke, and B. T. Yen. 2020. "The Relationship between Transport, Housing and Urban Form: Affordability of Transport and Housing in Indonesia." *Case Studies on Transport Policy* 8 (1): 252–62.
- Diaz Olvera, L., D. Plat, and P. Pochet. 2008. "Household Transport Expenditure in Sub-Saharan African Cities: Measurement and Analysis." *Journal of Transport Geography* 16 (1): 1–13.
- Dodson, J., B. Gleeson, and N. G. Sipe. 2004. "Transport Disadvantage and Social Status: A Review of Literature and Methods." Urban Policy Program. Research Monograph 5.
- Duchène, C. 2011. "Gender and Transport." International Transport Forum Discussion Paper 2011-11. [www.internationaltransportforum.org/jtrc/DiscussionPapers/jtrcpapers.html](https://www.internationaltransportforum.org/jtrc/DiscussionPapers/jtrcpapers.html).
- EC (European Commission). 2020. *Developments and Forecasts on Continuing Urbanization*. European Commission. [https://knowledge4policy.ec.europa.eu/foresight/topic/continuing-urbanisation/developments-and-forecasts-on-continuing-urbanisation\\_en](https://knowledge4policy.ec.europa.eu/foresight/topic/continuing-urbanisation/developments-and-forecasts-on-continuing-urbanisation_en).
- Fan, Y., and A. Huang. 2011. "How Affordable Is Transportation? A Context-Sensitive Framework." Report No. CTS 11-12, Center for Transport Studies, University of Minnesota.
- Field, E., S. U. Junaid, A. Majid, A. Shahid, and K. Vyborny. 2020. *Transport and Urban Labor Market Integration: Evidence on Travel Time and Congestion from a Mass Transit Quasi-experimental Evaluation and Evidence on Firms from a Randomized Control Trial in Pakistan*. 3ie Grantee Final Report. New Delhi: International Initiative for Impact Evaluation (3ie).

- Fillone, A. M., and I. Mateo-Babiano. 2018. “Do I Walk or Ride the Rickshaw? Examining the Factors Affecting First- and Last-Mile Trip Options in the Historic District of Manila (Philippines).” *Journal of Transport and Land Use* 11 (1): 237–54.
- Fried, T., and I. Abubaker. 2019. “In African Cities, Mapping Paratransit Makes for Smarter Mobility.” *The City Fix* (blog), May 27, 2019. <https://thecityfix.com/blog/african-cities-mapping-paratransit-makes-smarter-mobility-travis-fried-iman-abubaker/>.
- Gauvin, L., M. Tizzoni, S. Piaggese, A. Young, N. Adler, S. Verhulst, and C. Cattuto. 2020. “Gender Gaps in Urban Mobility.” *Humanities and Social Sciences Communications* 7 (1): 1–13.
- Ghani, M. N. N., M. Z. Ahmad, and S. H. Tan. 2007. “Transportation Mode Choice: Are Latent Factors Important?” In *Proceedings of the Eastern Asia Society for Transportation Studies, Vol. 6, 2007. Eastern Asia Society for Transportation Studies*.
- Gómez-Lobo, A. 2011. “Affordability of Public Transport: A Methodological Clarification.” *Journal of Transport Economics and Policy* 45 (3): 437–56.
- Gonzalez Dominguez, K., A. L. Machado, B. Alves, V. Raffo, S. Guerrero, and I. Portabales. 2020. *Why Does She Move? A Study of Women’s Mobility in Latin American Cities*. Washington, DC: World Bank.
- Gwilliam, K. 2017. “Transport Pricing and Accessibility.” Moving to Access, Brookings Institution, Washington, DC.
- Higgins, B. 2019. “Understanding How Women Travel.” Metro, Los Angeles, CA. <https://calcog.org/understanding-how-women-travel/>.
- IFC (International Finance Corporation), Uber, and Accenture. 2018. *Driving toward Equality: Women, Ride-Hailing, and the Sharing Economy*. Washington, DC: IFC.
- Imre and Çelebi. 2017. İmre, Ş., & Çelebi, D. 2017. “Measuring comfort in public transport: a case study for İstanbul”. *Transportation Research Procedia*, 25, 2441-2449.
- Kett, M., E. Cole, and J. Turner. 2020. “Disability, Mobility and Transport in Low- and Middle-Income Countries: A Thematic Review.” *Sustainability* 12 (2): 589.
- Khosla, R. 2009. “Addressing Gender Concerns in India’s Urban Renewal Mission.” United Nations Development Programme (UNDP) India.
- Knupfer, S. M., V. Pokotilo, and J. Woetzel. 2018. *Elements of Success: Urban Transportation Systems of 24 Global Cities*. New York: McKinsey& Company.
- Kumar, M., S. Singh, A. T. Ghate, S. Pal, and S. A. Wilson. 2016. “Informal Public Transport Modes in India: A Case Study of Five City Regions.” *IATSS Research* 39 (2): 102–09.
- Kunieda, M., and A. Gauthier. 2007. “Gender and Urban Transport: Fashionable and Affordable.” Deutsche Gesellschaft für Technische Zusammenarbeit (GTZ).
- Lecompte, M. C., and J. P. Bocarejo. 2017. “Transport Systems and their Impact on Gender Equity.” *Transportation Research Procedia* 25: 4245–57.
- Lei, L., S. Desai, and R. Vanneman. 2019. “The Impact of Transportation Infrastructure on Women’s Employment in India.” *Feminist Economics* 25 (4): 94–125.
- Lenormand, M., J. M. Arias, M. San Miguel, and J. J. Ramasco. 2020. “On the Importance of Trip Destination for Modelling Individual Human Mobility Patterns.” *Journal of the Royal Society Interface* 17 (171), 20200673.
- Libertun de Duren, N. R. 2018. “The Social Housing Burden: Comparing Households at the Periphery and the Centre of Cities in Brazil, Colombia, and Mexico.” *International Journal of Housing Policy* 18 (2): 177–203.
- Litman, T. 2020. *Transportation Affordability Evaluation and Improvement Strategies*. Victoria Transport Policy Institute. <https://www.vtpi.org/affordability.pdf>.
- Lucas, K. 2010. “Making the Connections between Transport Disadvantage and the Social Exclusion of Low-income Populations in the Tswane Region of South Africa.” *Journal of Transport Geography* 19 (6): 1320–34.
- Mahadevia, D. 2015. “Promoting Low Carbon Transport in India: Gender Sensitive Transport Planning for Cities in India.” CEPT University.
- Márquez, L., V. Cantillo, and J. Arellana. 2014. “How Are Comfort and Safety Perceived by Inland Waterway Transport Passengers?” *Transport Policy* 36: 46–52.
- Mateo-Babiano, I. 2015. “Pedestrian’s Needs Matter: Examining Manila’s Walking Environment.” *Transport Policy* 45: 107–15.
- Mejía-Dorantes, L., and P. S. Villagrán. 2020. “A Review on the Influence of Barriers on Gender Equality to Access the City: A Synthesis Approach of Mexico City and Its Metropolitan Area.” *Cities* 96, 102439.
- Metro (Los Angeles County Metropolitan Transportation Authority). 2019. “Understanding How Women Travel”. [http://libraryarchives.metro.net/DB\\_Attachments/20190294/UnderstandingHowWomenTravel\\_FullReport\\_FINAL.pdf](http://libraryarchives.metro.net/DB_Attachments/20190294/UnderstandingHowWomenTravel_FullReport_FINAL.pdf).
- Munshi, T. 2016. “Built Environment and Mode Choice Relationship for Commute Travel in the City of Rajkot, India.” *Transportation Research Part D: Transport and Environment* 44: 239–53.
- Ng, W. S., and A. Acker. 2018. “Understanding Urban Travel Behaviour by Gender for Efficient and Equitable Transport Policies.” International Transport Forum Discussion Paper.
- Perez, C. C. 2019. *Invisible Women: Exposing Data Bias in a World Designed for Men*. Random House.
- Peters, D. 2013. *Gender and Sustainable Urban Mobility*. Global Report on Human Settlements. UN Habitat. doi:10.13140/RG.2.1.4746.9287.
- Pojani, D., and D. Stead. 2015. “Sustainable Urban Transport in the Developing World: Beyond Megacities.” *Sustainability* 7 (6): 7784–805.
- Priye, S., and M. Manoj. 2020. “Exploring Usage Patterns and Safety Perceptions of the Users of Electric Three-Wheeled Paratransit in Patna, India.” *Case Studies on Transport Policy* 8 (1): 39–48.
- Roy, S., and D. Basu. 2020. “An Approach towards Estimating Critical Value of Waiting Time at Transit Stops.” *Journal of Traffic and Transportation Engineering* 8 (2): 257–66.
- Sanchez-Atondo, A., Garcia, L., Calderon-Ramirez, J., Gutiérrez-Moreno, J. M., & Mungaray-Moctezuma, A. 2020. Understanding Public Transport Ridership in Developing Countries to Promote Sustainable Urban Mobility: A Case Study of Mexicali, Mexico. *Sustainability*, 12(8), 3266.
- Shah, S., Viswanath, K., Vyas, S., & Gadepalli, S. 2017. “Women and Transport in Indian Cities”. Institute for Transportation and Development Policy, 10-1.
- Shah, S., and A. Raman. 2019. “What Do Women and Girls Want from Urban Mobility Systems?” Ola Mobility Institute, New Delhi.
- Shrayat, A., M. Abu Alfoul, S. Moridpour, N. Al-Hurr, K. Magableh, and I. Harahsheh. 2019. “Waiting Time of Public Transport Passengers in Jordan: Magnitude and Cost.” *The Open Transportation Journal* 13 (1): 227–35.
- Sikdar, M. M. H., M. S. K. Sarkar, and S. Sadeka. 2014. “Socio-economic Conditions of the Female Garment Workers in the Capital City of Bangladesh.” *International Journal of Humanities and Social Science* 4 (3): 173–79.
- Singh, Sanjay K. 2005. “Review of Urban Transportation in India”. *Journal of Public Transportation*, Volume 8 (2005): 1.
- Soman, A., H. Kaur, and K. Ganesan. 2019. *How Urban India Moves: Sustainable Mobility and Citizen Preferences*. New Delhi: Council on Energy, Environment and Water (CEEW).
- Srinivasan, S. 2005. “Influence of Residential Location on Travel Behavior of Women in Chennai, India.” In *Research on Women’s Issues in Transportation, Report of a Conference*, Vol. 2, 4–13.
- Statista Research Department. 2018. “Cost for public transport in cities worldwide”. Statista. <https://www.statista.com/statistics/275438/public-transport-cost-cities/>
- Tilahun, N., and M. Li. 2015. “Walking Access to Transit Stations: Evaluating Barriers with Stated Preference.” *Transportation Research Record* 2534 (1): 16–23.
- Tilley, S., and D. Houston. 2016. “The Gender Turnaround: Young Women Now Travelling More than Young Men.” *Journal of Transport Geography* 54: 349–58.
- Tiwari, G., and N. Singh. 2018. “Travel to Work in India: Current Patterns and Future Concerns.” Transport Research & Injury Prevention Program. Indian Institute of Technology Delhi.
- Tracey-White, J. D. 2005. *Rural-Urban Marketing Linkages: An Infrastructure Identification and Survey Guide*, Vol. 161. Food & Agriculture Organization.
- UN (United Nations). 2018. “Around 2.5 Billion More People Will Be Living in Cities by 2050, Projects New UN Report.” United Nations. <https://www.un.org/development/desa/en/news/population/2018-world-urbanization-prospects.html>.
- UN-Habitat. 2003. *The Challenge of Slums: Global Report on Human Settlements*. UNHNP. <https://www.un.org/ruleoflaw/files/Challenge%20of%20Slums.pdf>.
- Priya Uteng, T., & Turner, J. 2019. “Addressing the linkages between gender and transport in low-and middle-income countries”. *Sustainability*, 11(17), 4555.
- Vaalavuo, M. 2016. “Women and Unpaid Work: Recognise, Reduce, Redistribute!” European Commission. <https://ec.europa.eu/social/main.jsp?langId=en&catId=89&newsId=2492&furtherNews=yes>.
- Walton, D., and S. Sunseri. 2010. “Factors Influencing the Decision to Drive or Walk Short Distances to Public Transport Facilities.” *International Journal of Sustainable Transportation* 4 (4): 212–26.