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## Gendered differences in mobility and the demand for transport in Ethiopia

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- In spite of rapid urbanisation, many urban African residents continue to be constrained by poor transport options and generally low mobility. Inadequate transportation system in African cities has a particularly disproportionate effect on women, whose travel patterns, needs, and means of mobility are notably different from men's.
- The introduction of effective transportation services for women has the potential to meet their latent demand for transport, promote access to services and improve well-being.
- We study how mobility and latent travel demand vary by gender, particularly for women, with the introduction of improved transport.
- We conduct a field experiment with 1,000 couples in Addis Ababa, Ethiopia. Participants received travel credit that they could use to reimburse the cost of trips taken with a private taxi service over two months. Couples were randomly assigned to either: 1) a woman arm, where the taxi service and credit was offered to women; 2) a man arm, where the credit was offered to men; or 3) a couples arm, where the credit was offered to the couple jointly.
- Our findings highlight the need for policymakers and urban planners to recognize the role of gender as a core determinant of a high-quality, equitable transport system. Effective transport policies and programs must internalise and proactively respond to gender-based differences in travel demand, mobility, and access across all phases of planning, design, and implementation.

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## Overview of the research

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### Transportation in urban Africa

Africa's cities are the most rapidly growing in the world; current estimates indicate that by 2050, African cities will grow by an additional 900 million inhabitants and will be home to more than two-thirds of the continent's population (OECD et al., 2022). While urban expansion in Africa will offer opportunities for growth and development, such growth will also present significant challenges to the planning, managing, and financing of public infrastructure and services, particularly urban transportation systems.

A well-connected transport network would have the potential to significantly reduce people's travel burden, both in terms of costs and travel time, which could encourage growth, foster innovation, and improve access to local services (Glaeser, 2008; Glaeser and Ponzetto, 2010). As cities grow, however, the demand for transportation may increase at a faster pace than what transit systems are able to accommodate, which can lead to poor access to and inefficiencies in service provision. Common problems include increased traffic and congestion, road accidents, delays and longer waiting times, and limited access to transport service providers. Moreover, increased urbanisation can push city boundaries farther out, and newly inhabited areas may be at higher risk of isolation and experiencing breaches in connectivity in the absence of effective planning (e.g. the introduction of additional transport routes, the expansion of road networks, etc.).

### Gendered differences in transport

Inadequate transportation in African cities has a particularly disproportionate effect on women, who are likely to face additional social and structural barriers that prevent them from accessing public services (Bryceson and Howe, 1993; Seedhouse et al., 2016). Women's travel patterns are notably different from men's, and these differences can be characterised by deep and persistent inequalities. Within any given urban setting, women have inferior access to both private and public means of transport while at the same time assuming a higher share of their household's travel burden (Allen et al., 2016; Babinard and Crochet, 2012; Bryceson and Howe, 1993). Limited access to financial resources and poor access to safe transit may limit a woman's ability to choose whether and how to travel outside the home, particularly if she has to be more conscientious of her security and wellbeing in public settings (Christensen and Osman, 2021). A woman may therefore be compelled to modify her travel behaviour (e.g. traveling during the day, taking multiple transport routes, avoiding travel on weekends and peak travel times, etc.) in order to ensure her personal safety and to minimise any risks of social and sexual harassment that she may face in public spaces, and particularly while using public modes of transport (Borker, 2019). To this end, a woman's constrained mobility adversely affects her autonomy, economic and social empowerment, and overall wellbeing (Allen et al., 2018; Babinard and Crochet, 2012; OECD et al., 2022).

## Our study

Improved transportation services for women have the potential to:

1. Meet women's demand for transport and increase their physical mobility;
2. Promote access to destinations of interest and services that enhance human capital and productivity (health, education, etc.);
3. Improve women's economic, political, and social opportunities (jobs, markets, social services, cultural and political spaces, etc.), which in turn, may positively affect their autonomy and wellbeing.

We study the extent to which mobility and travel demand vary by gender, particularly for women, with the introduction of high-quality, on-demand, private transport. We conducted a field experiment in Addis Ababa, Ethiopia, to evaluate the impact of introducing this private transport option on mobility, access to services, and desired destinations as well as measures of empowerment, particularly for women. As part of the study, 1,000 married couples in Addis Ababa were recruited and were offered travel credit that could be used to reimburse the costs of private taxi rides over a two-month period. Couples were randomly assigned into one of three arms - a Woman arm, a Man arm, or a Couple arm - which determined whether the credit was presented to the woman alone, the man alone, or the couple jointly. Data on travel behaviour, trips taken, and passengers' demand for transport was collected both before and after the credit and transport service was offered. Spatial data on trip routes are also collected, which allows us to observe gendered differences in preferred destination, travel time, and distance. By randomising the credit recipient, we aimed to learn how utilisation of the credit and travel behaviour may change when a recipient's spouse is also aware of the opportunity to cover travel costs with the credit received. This may be particularly important in contexts where a woman's spouse may restrict her travel outside the home because they control the household's finances and travel more (Babinard and Crochet, 2012; OECD et al., 2022).

**Figure 1: Pedestrian facilities in Ethiopia**



(a) Pedestrians crossing the road and a mini-bus, Addis Ababa



(b) Pedestrian crossing the road, Harar

**Figure 2: Modes of transportation in urban Ethiopia**



(a) Mini-buses parked at the Abrehot Library, Addis Ababa



(b) Parked bajajes waiting for the passengers, Harar

**Figure 3: Markets in Ethiopia**



(a) Mini-buses waiting at Mercato, Addis Ababa



(b) Weekday market in a small town, Omo Valley

**Figure 4: Peak hour waiting lines at Megenagna, the busiest transport intersection of Addis Ababa**



## Key findings

We establish a series of facts about residents' experiences with the existing state of travel and the public transportation system in Addis Ababa.

| FINDING   | POLICY IMPLICATION   |
|---|--|
| 1. Half of all respondents in our study report that accommodations for pedestrians are poor in Addis Ababa, and facilities for pedestrians (e.g. sidewalks, walkways) are limited in the city. More than 80 percent of all respondents say that it is difficult to be a pedestrian.   | 1. Measures to improve pedestrian travel, the most common form of transport in Addis, include upgrading and maintaining roads, peri-urban streets, and sidewalks to facilitate travel by foot, improving access to public transport stops, and reducing the cost of travel for people who reside in peripheral neighborhoods.  |
| 2. Safety is a concern for both men and women in Addis, with 65 percent of women and 48 percent of men reporting that they feel unsafe walking in their neighborhood at night. Over 90 percent of respondents say that they avoid traveling at night. The choice to restrict hours of travel is correlated with having previously experienced harassment or unwanted attention, as confirmed by 23 percent of women and 21 percent of men in our study. | 2. Measures to address these risks include but are not limited to 1) employing security personnel at stations and on public transport modes (buses, metro), with increased security measures at times when women travel; 2) providing adequate lighting on sidewalks and at bus/metro stops; 3) and introducing gendered transport modes (women-only buses, metro cars, etc.). |

We find significant differences in travel behaviour by gender.

| FINDING  | POLICY IMPLICATION  |
|--|---|
| 3. Men report traveling more frequently than women, with 80 percent of men traveling daily or almost every day compared to less than 40 percent of women.  | 3. Expanding access to effective and convenient transport for women can increase women's travel and mobility.   |
| 4. About 35 percent of women work from home or do not commute to their workplace compared to 15 percent of men. Women whose work requires travel also choose workplaces that are closer to their residences: an average of 33 minutes to travel to work compared to 38 minutes for men. Moreover, the proportion of women who only walk to work (44 percent) is double that of men (22 percent). While almost all women in our sample reported traveling to the market for grocery shopping, less than 30 percent of men do so. Women also go grocery shopping more often, with over a quarter reporting weekly or more frequent travel compared to only 3 percent of men. | 4. Destination choices, such as workplaces and markets, and their respective travel routines are also gendered. Data on women's travel behaviour, including preferred travel destinations, times of travel, modes of travel, and constraints to mobility, is needed to inform the planning and implementation of transport services that effectively meet women's demand. |

From our intervention, we also note gender differences in mobility and utilisation of travel credit:

- 1. We find no significant differences in voucher take-up** (about 75 percent of respondents in each arm took at least one trip), **total trips made, and the proportion of credit spent**, suggesting that the improved transport option may have contributed to closing the physical mobility gap.

2. Although we do not see significant differences in the total number of trips, **participants in the Woman Arm spent, on average, 13 ETB more per trip than in the Man Arm**, suggesting they might have travelled longer distances.

**3. Women were significantly more likely than men to go on taxi trips alone** (62 percent in Woman Arm compared to 48 percent in Man Arm). The proportion of trips made with the spouse was lowest in the Couple Arm (only 17 percent of all trips), potentially because spouses could travel separately. The proportion of trips made with children is higher in the Woman Arm (34 percent) than in the Man Arm (21 percent).

Finally, our preliminary findings show that the intervention helped respondents to reduce costs related to the job search: about 30 percent of women and 24 percent of men who made at least one trip agree that the taxi service helped with their job search. This observation suggests the presence of a spatial mismatch, where job opportunities for women and lower-income households are located farther from their places of residence. Offering access to free and efficient transport services reduces barriers to physical mobility and the cost of job search, which may result in increased employment and labour force participation.

## Policy motivation and recommendations

Our study seeks to achieve a number of goals that are important for policy and practice. By providing high-quality, free transport that is available on demand and at any time, we reduce a wide range of constraints that may be contributing to existing travel burdens in Addis Ababa. In doing so, we can more effectively measure the latent demand for travel by observing how mobility patterns, travel frequency, and measures of travel behaviour change in a less constrained environment. This understanding of latent demand will allow practitioners and planners to more effectively target resources to eliminate weaknesses and gaps in access and service provision.

In order to meet the demand for safe, efficient, and inclusive transport, policies should be designed with vulnerable groups in mind. Our findings can directly inform policymakers on how transport and the current infrastructure can be more effectively leveraged to expand mobility, meet travel demand, and positively contribute to wellbeing, particularly for women and households in resource-constrained settings. Inadequate transportation can discourage people from traveling, which in turn results in reduced access to amenities and lower utilisation of healthcare, schooling, and other public goods and services. Lower-income households living in less accessible areas with poor means of transport are therefore most likely to suffer the most.

Transport is gender-sensitive, and the provision of high-quality, affordable transport has direct implications for more expansive measures of social and economic wellbeing, including employment, job seeking, and labour force participation, for women. Investigating gender-specific travel demand will help policymakers identify gender-based barriers and inequalities in mobility and will provide a basis for

developing more inclusive transportation strategies. For transport planning to effectively address gender differences in travel demand and behaviour, it is crucial that programmes and interventions: 1) be informed by data on gender differences to ensure they meet the travel needs of women as well as men; and 2) ensure that women, both as planners and as stakeholders, be involved in the planning process from the onset. To this end, our findings are directly commensurate with and can serve to inform key transport and infrastructure development initiatives that are being planned in Addis Ababa, such as the Non-Motorised Transport Strategy (NMT) and particularly the 2030 Strategic Comprehensive Transport Development Plan (SCTDP).

Improving mobility through the expansion of public transport networks and other related investments has long been considered a major development priority, particularly in urban settings where the demand for efficient and effective transport, both as a means and as an end, is high. Well-organised and effective public transport has the potential to minimise travel burden and increase mobility to a range of desirable and productive destinations, both for women and for households more generally. These improvements may boost demand for the utilisation of local services, encourage productivity, and, in the long run, foster growth and development.

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