

Commuting Trips, Income and Gender in the Metropolitan Maputo, Mozambique

Atanásio Tembe, Anselmo Matusse

Kaleidoscopio: Pesquisas em Políticas Públicas e Cultura, Maputo, Mozambique

Email: tembe.atanasiodz@gmail.com, anselmomatusse@gmail.com

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Abstract

The deterioration of public transport services coupled with rapid urbanization and the increased use of private transport imposes an increasing burden on the commuters in the metropolitan area of Maputo. Using household surveys conducted in Maputo, this paper seeks to investigate the commuting trips and gender relations by employing binomial logistic regression. The empirical results revealed the household income as the main attribute affecting the likelihood of using bus transportation. The results also indicated that women are less likely to use buses in their daily commute. The main implication of these findings is that commuters from the low-income households particularly women will have their motorized mobility reduced unless proper policies are designed catering to their mobility needs.

Keywords

Sub-Saharan Africa, Chapas, Paratransit, Binomial Logistic Regression, Commuting, Gender

1. Introduction

Urban mobility plays a crucial role in the residents' and workers' quality of life as well as the facilitation of economic development of a country. In this paper we use the term "mobility" to refer to the physical use of a specific mode of transport that an individual needs to cover a geographic distance from point A to point B (Goncalves et al., 2017). When analyzing urban mobility, there are three main stakeholders that need to be considered, namely: the users of urban transport systems, transportation service providers, and public municipal authorities (PMAs) (Suguiy, Carvalho, & Ferreira, 2020). However, in this paper, we focus specifically on the users of urban infrastructures, looking at how gender and income influence their mobility and their perceptions about the transportation

service providers and the PMAs, with special geographic focus in the Greater Maputo Metropolitan Area, in Mozambique, southern Africa.

Maputo is the capital and the most urbanized region in Mozambique with more than 3 million inhabitants. Because of its political, economic and financial status, Maputo attracts a large number of people from the other provinces and emigrants from neighboring countries. In turn, the processes above-mentioned add pressure to the already deficient public transportation in the city. Like in most cities in the developing countries, daily commuting is increasingly becoming difficult specifically to the low-income residents partly due to the rapid suburban sprawl and increased use of private transport, and deterioration of public transport services. In Mozambique, few studies have focused on mobility. From those studies some focused on the drivers and safety (Couto et al., 2009; Couto & Lawoko, 2011); other studies have focused on the demand for bus services (Tembe et al., 2017); other studies have focused on mapping the rapid paratransit systems and their operations (Colaço & Serra, 1998; Leão, 2012; Klopp & Cavoli, 2019); and other studies have focused on urban transport policy choices and coordination between public and private entities (Araújo, 2014; Mendonça, 2014; Seco, Bastos-Silva, & Matos, 2017; Mabucanhane, 2018); other studies have focused on alternatives to mobility among commuters (Federhen, 2018) and some studies focused on the interplay between spatial planning and urban transportation (Jorge & Melo, 2014). However, while those studies have offered valuable insights into the dynamics of public transportation in Maputo, they don't address the interplay between mobility, gender and income, specifically in contexts like Maputo. This limitation is noticed in the mainstream literature on public transport. For example, Tara (2011) states that "gender has not been fully integrated into the mainstream of either the infrastructure debate or the debate on transport services". Scheiner and Holz-Rau (2012), argue that "gender has played an important role since about 1980, when the issue of 'women and transport' entered the field. There is now substantial evidence for gender differences in travel behavior". However, "relatively little is known about the reasons and mechanisms such differences are based on".

Understanding the interplay of these three factors is important because most women in Maputo do not own private vehicles, and according to JICA (2012), they make fewer trips (1.5 trips) than men (1.9 trips). In addition, like other Sub-Saharan African cities Maputo faces gender-based socio-economic inequalities being the women the most vulnerable group. The authors believe that a better understanding of the interplay of the three variables can contribute to diminish the socio-economic inequalities through better mobility strategies that facilitate women's participation in the urban activities (e.g. employment, school, health centers). PMAs need to consider the commuters' travel behavior and needs in their decision-making process to facilitate the commuters' mobility, ensure well-being and social inclusion in Maputo. Next, we review the foundations upon which the urban transportation system is built to better understand

travel behavior in the metropolitan area of Maputo.

After the independence in 1975, the urban transportation system was nationalized at the outset, yielding to a regulated public transport system. Urban transportation services were exclusively provided by a state-owned bus company, Transportes Urbanos de Maputo (TPM). Fares were regulated with a purpose to ensure affordability for most people. At the beginning of the 1980s, Maputo witnessed an increased immigration of people from rural areas. Meanwhile, the bus company experienced difficulties with providing bus services which persists up to this day, which led to emergence of other modes of transport that constitute the present mobility features of Maputo with their own challenges.

In the metropolitan area of Maputo, the modal share of urban transport is currently dominated by walking (45.8%), followed by paratransit chapas (32.9%), private cars (10.2%), buses (9.2%), train (0.6%) and others (1.3%). Comfort, travel time and convenience are commonly known to influence decisions about choosing a mode of transport. Compared to the train, the frequency of paratransit and buses is considered low. Overall, the crew members of the chapas are not the owners but are hired workers who must pay the agreed daily fees to the vehicle owners while ensuring the maintenance of the vehicles. In order to maximize benefits, the paratransit crew try to make as many trips as possible by boarding more passengers into the crowded vehicle while reducing the maintenance expenses. It should be noted that more than 50% of paratransit drivers do not have a driving license for the public transport service, which might contribute to the reported lack of cordiality towards passengers. The number of railway users is insignificant, and the train only makes two daily commuting trips during the morning and the evening peak hour periods.

Furthermore, public transportation users were asked about their perceptions of the service provided, namely public transport frequency, vehicle condition, crew behavior, and the fare. The results from the respondents are displayed in **Figures 1-4**. Overall, the users perceive the level of the public transport services as well as crew behavior as being of poor quality, specifically in regard to buses and chapas. Under these circumstances, the authors envisage a modal shift from

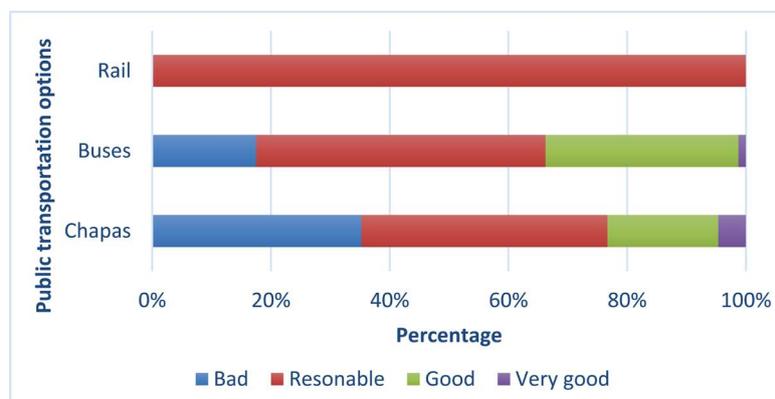


Figure 1. User perception of public transport services.

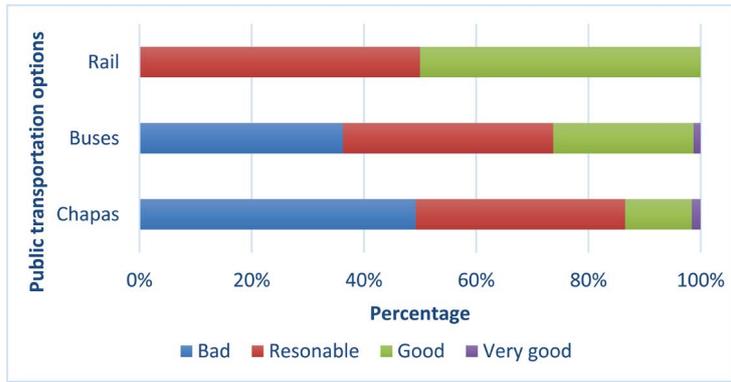


Figure 2. User perception of vehicle condition.

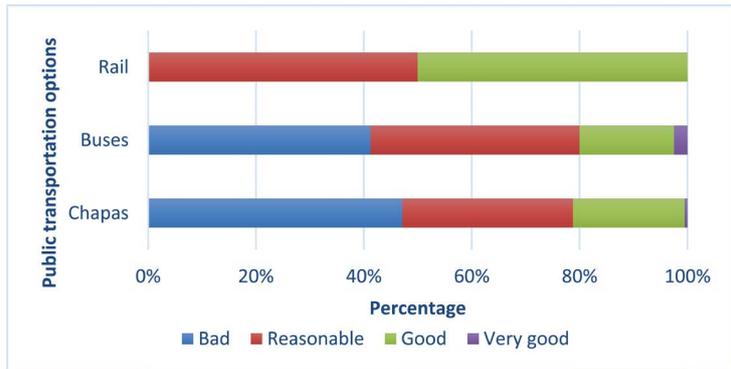


Figure 3. User perception of crew behavior.

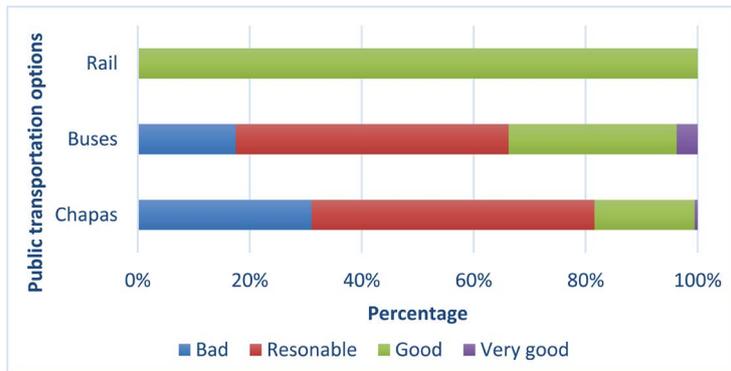


Figure 4. User perception of the transportation fare.

collective transportation to private transport.

This paper is an attempt to understand commuting trips, income and gender relations in the Metropolitan Area of Maputo, and specifically it examines the travel behavior of people and the relationship between gender and transportation behavior in the Greater Maputo Metropolitan Area.

The paper is organized as follows. In Section 2, previous studies are reviewed. Section 3 discusses data collection procedures and methods. Section 4 is devoted to model estimation and discussion of results. Finally, the conclusion is presented in Section 5.

2. Literature Review

The factors influencing the use of transportation have been one of the main concerns in the literature on mobility. According to the transport mode choice theory, mode choice is influenced by the characteristics of the decision maker or individual, the number and attributes of alternatives, and their decision rule. Under Travel Choice Theories a decision maker is assumed to rank possible alternatives in order of his or her preference and to choose the option from the available alternatives which he or she considers the most desirable considering his or her preferences and the relevant constraints placed on decision-making (Oum, 1979; Gillen, 1977; Asensio, 2002; Müller, Tscharakstschiew, & Hasse, 2008; Buehler, 2011). The decision maker can be an individual or a group of people. Individuals not only face different choice situations; they also have varying tastes which in turn impact their choice of mode of transportation. However, the Travel Choice Theory, with its overemphasis on calculus and availability of alternatives in developed countries, does not account for the travel behavior in developing countries, where other factors have been shown to impact the commuters' choice of mode of transportation.

In a study conducted in Dar es Salaam, Tanzania, *Sohail et al. (2004)* showed that most poor people are dependent on public transport and concluded that poor people are affected not only by the fares, but also by the lack of services on precarious roads. Another research in six cities in Sub-Saharan Africa by *Diaz Olvera et al. (2013)*, revealed a relatively small public transport sector, concentrated on the main radial roads, on the one hand, and a growing informal sector or paratransit on the other hand. Domestic ownership of two-wheeled motor vehicles and private cars are reported to be very low. A comparison of urban transport systems between African cities by *Godard (2013)* identified accessibility as the main concern for the use of buses and paratransit. For example, it has been found that a substantial part of urban dwellers does not have daily access to public transport services, because they are expensive and not easily accessible.

A research by *Srinivasan and Rogers (2005)* examined the travel behavior of low-income groups in India and found that travel behavior measures such as choice of mode, travel time, cost and frequency are affected by location. According to *Cheng et al. (2013)*, low-income families in China have lower levels of mobility than other income groups. Low-income families not only make fewer trips, but also shorter trips. Regarding the mode of transport, hiking, motorcycles and bicycles were identified as the main non-motorized transport, while for motorized trips the bus is the most dominant mode. A further analysis by *Barter (1999)*, reveals that the mobility of poor people is extremely limited mainly because many cannot afford any form of private motorized transport or public transport, although in some Asian cities low-income households have motorcycles. Despite making shorter and shorter trips, the urban poor take longer travel time than people from higher-income families.

Since Rosenbloom (1978) articulated the need for a study of women's travel issues some studies have sought to pay special attention to gender and mobility from a variety of disciplinary fields. A mode choice investigation in Germany by Scheiner and Holz-Rau (2012) with focuses on car use in car deficient households in Germany and concluded that "deeply rooted gender norms are at play" in car use in such households feminist and economic studies have shown that low income and restricted access to labor market influence women's mobility (Blumen, 1994; McDonald, 1999). Other studies, specifically in sociology, have shown the link between social roles of women and mobility (Hanson & Johnston, 1985; Wen & Koppelman, 2000). Social psychological studies have focused on how attitudes and norms based on preference shape women's travel behavior (Hakim, 2000). Anthropological and feminist studies also highlighted the patriarchal power relations that might impact women's mobility (Hartman, 1979; Walby, 1990). Finally, some studies have focused on gender and race and their impacts on women's mobility (Hu, 2020).

3. Data Collection and Methods

In this paper, data collection was carried from December 9-24, 2019 in the metropolitan area of Maputo namely Maputo City, Matola, Boane and Marracuene. Ten surveyors were selected from the main universities in Maputo. The surveyors were selected on the basis of their academic records and were invited to join a workshop program on how the questionnaires should be filled as well as ethical issues related to data collection. The sample size was determined based on the proposal from (Israel, 1992) and the number of daily commuters in the metropolitan area. Israel (1992) proposes that to determine an appropriate sample size the following criteria must be considered: "the purpose of the study, the level of precision, the level of confidence or risk and the degree of variability in the attributes being measured". In terms of the level of confidence or risk Israel (1992) suggests that for a size of population greater than 100,000 the equivalent sample size should be of 400 for a 95% confidence level. Consequently, considering the fact that according to (JICA, 2012) Maputo records more than 1.5 million travelers in a daily basis, and to compensate for risks resulting from bad questionnaire filling and the refusal to answer, the sample size was increased from 400, as suggested by 38 to 800 observations. Of the 800 questionnaires distributed, 762 could be used in the study

A 4-page questionnaire with two basic sections was prepared. Similar to the questionnaires used in household surveys, the first part of the form comprises questions related to the socioeconomic attributes of households. Some variables included the number of vehicles, composition of households, income, occupation, gender of household members. The second part of the questionnaire consisted of the daily mobility of household members. Respondents were asked about the mode of transport used in the last 24 hours, the points of origin and arrival, the time of departure and arrival, the costs of the modes used, the travel

time and the reasons for choosing the mode used. Additionally, respondents were questioned about their perceptions of the attributes of the existing transportation modes.

In this research the authors used the binomial logistic regression because they believe that in developing cities like Maputo the majority of the population has no choice in terms of transport alternatives. In Maputo the majority of the population using public transport tends to take the mode of transport that first arrives at the public transport terminals or bus stops. This observation is at odds with previous studies on transportation.

The sample of the data collected in Maputo is described in **Table 1**. From **Table 1**, approximately 37% of individuals are less than or 19 years old. The proportion of individuals aged between 20 years and 30 years old is approximately 32%. Approximately 28% of individuals are aged between 30 and 60 years old whereas individuals over 60 years old are less than 5%. More than half of households have more than 3 persons per family. With respect to occupation, the combined ratio of persons with no job, housewives, and students, is at 52%. The proportion of households with a car is about 24% implying that most individuals rely on walking or public transportation in their commuting trips.

Table 1. Social and economic status of respondents (1490).

Characteristics	Statistics
Gender	Male (48.9%), Female (51.1%)
Age	
≤19 years old	Male (18.2%), Female (18.6%)
20 - 30	Male (15.6%), Female (15.8%)
31 - 40	Male (6.0%), Female (6.0%)
41 - 50	Male (3.5%), Female (5.0%)
51 - 60	Male (3.2%), Female (3.8%)
60+	Male (2.0%), Female (2.3%)
Household size	
3 persons or less	18.8%
4 or more persons	51.2%
Occupation	
No job	6.9%
Housewives	7.5%
Primary school students	14.7%
High school students	17.3%
University students	5.5%
Employees	20.5%
Own account	16.6%
Others	11.0%
Car ownership	No car (76.4%), With a car (23.6%)

4. Model Estimation and Discussion

The literature advocates some associations between transportation alternatives and the attributes of individuals. A binomial logistic regression equation was estimated with the variables selected in accordance with the literature review. Only individuals commuting by paratransit and public buses were considered in the analysis. **Table 2** shows the variables that are included in the binomial logistic regression.

The following assumptions are made:

- The dependent variable is the transport mode—buses and paratransit chapas.
- Explanatory variables are individual attributes—gender, income, and work status.

Table 3 shows the likelihood of selecting a bus over paratransit in Maputo. In general, statistical indicators show that the model is relatively appropriate and a good fit with the Pseudo R-square at 69%, while the p -value (the exact level of significance level) is almost zero. As stated by [Gujarati \(2011\)](#), the Pseudo R-square value is not a measure of the proportion of the variance in the regressand explained by the regressors included in the model. Therefore, the Pseudo

Table 2. Variables in the model

Transportation alternative	1 = Bus; 0 = paratransit Chapas
Attributes of the commuter	
Gender	1 = Female; 0 = Male
Income (Mozambican Metical)	Income levels (Mts)
	1 = Mt 4999 or less
	2 = Mts 5000 - 14,999
	3 = Mts 15,000 - 29,999
	4 = Mts 30,000 - 49,999
	5 = Mts 50,000 or above
Job status	1 = Worker; 0 = Otherwise

Table 3. Binomial logistic results.

Variables	Coefficients	p -value
Intercept	-3.658	000***
Gender (Female)	-0.468	0.087
Income 1	4.860	000***
Income 2	4.010	000***
Income 3	3.307	000***
Income 3+	4.233	000***
Job 1	0.105	0.777
Job 2	0.439	0.177

Number of observations: 800; Loglikelihood: -211.633 (8 df); Chi-square p -value: 0.000; Pseudo R-square: 0.696. "***" 0.001 "**" 0.01 "*" 0.05 "." 0.1 "1".

R-square value should be carefully considered. Most of the variables included in the model are statistically significant with their p -values being practically zero.

As it is shown in **Table 3**, two variables are the most relevant when choosing buses in Maputo, namely, income; and gender. A negative coefficient implies reduced odds of an alternative over the other, whereas a positive coefficient implies the opposite. From **Table 3** it can be noted that individual income increases the likelihood of using buses over chapas, holding other variables constant. This positive relationship between the choice of buses and income is consistent with travel demand (Ben-Akiva & Lerman, 1985). The negative relationships between the choice of buses and gender indicate that women are less likely to use buses in their daily commute. Surprisingly, Salon and Gulyan (2019), also reported that women are less likely to use motorized modes in the large and small Kenyan cities. In a comparative analysis of the travel behavior between Maputo and Nairobi by (Tembe et al., 2020) it was reported that gender had no impact on the likelihood of selecting Non-Motorized Transportation (NMT) either in Maputo or Nairobi. This indicated that men and women are equally likely to walk. Another study by Tembe et al. (2019), revealed that gender (female) had no effect on the probability of choosing buses over paratransit in both cities.

In a research conducted by Tembe et al. (2019), Sub-Saharan African cities were described to have a relatively denser bus network in central areas and therefore also a higher service frequency compared to suburban zones. Because of this, paratransit are more likely to attract more users than buses in the city area.

Considering the results above, the authors conclude that with the continued rapid urbanization it is expected that a significant proportion of residents will continue to make their daily trips by foot. This means that their mobility (especially women's), will be reduced and consequently the difficulties in accessing, for example one's workplace or basic public services, will result in a lower quality of life. Additionally, given the perception of poor quality of the public transport service, the authors envisage a modal shift from collective transportation to private transport, creating a vicious cycle with negative implications for society and the environment. This modal shift from collective to private transportation is also evidenced by the literature on travel demand. According to Ortúzar and Willumsen (2011), economic growth provides the first impetus to increase car ownership and use while reducing public transport use. The literature suggests that with the reduced number of public transportation users, transportation operators might respond by increasing fares, reducing service frequency or both. Meanwhile these measures make car usage more attractive than before and induce more people to buy cars, thus accelerating the vicious cycle.

5. Conclusion

This research examined the interplay between mobility, gender and income in the Maputo Metropolitan Area, Mozambique. The survey was carried out from December 9-24, 2020 in the metropolitan area of Maputo, specifically, in Matola,

Boane and Marracuene. A 4-page questionnaire with two sections was prepared and a binomial logistic regression was applied. The first part of the form comprised questions related to the socioeconomic attributes of households and individuals. The second part of the questionnaire consisted of the travel behavior of the respondents.

The empirical results revealed the household income as the main attribute affecting the likelihood of using bus transportation in Maputo. The findings also indicated that women are less likely to use buses in their daily commuting. These results show that transportation behavior is strongly influenced by income and gender variables with women and men being unequally affected.

In view of these findings, the authors conclude that with the continued rapid suburban sprawl it is expected that a significant proportion of low-income commuters, especially women, will continue to make their daily trips on foot. Although walking is good for the environment and health purposes in sprawling developing cities like Maputo it constrains commuters' opportunities to participate in urban activities resulting in a low quality of life. What this implies is that transportation planners should consider income and gender while planning, designing and implementing transportation policies. Moreover, given the perception of poor quality of the public transport service, the authors envisage a modal shift from the collective to private transportation, creating a vicious cycle with negative implications for the society and the environment.

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Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

References

- Araújo, A. (2014). *Estudo do funcionamento dos transportes públicos em Maputo e desenvolvimento de ações de melhoria*. Master's Dissertation, Porto: Porto University.
- Asensio, J. (2002). Transport Mode Choice by Commuters to Barcelona's CBD. *Urban Studies*, 39, 1881-1895. <https://doi.org/10.1080/0042098022000003000>
- Barter, P. A. (1999). Transport and Urban Poverty in Asia: A Brief Introduction to the Key Issues. *Regional Development Dialogue*, 20, 143-163.
- Ben-Akiva, M. E., & Lerman, S. R. (1985). *Discrete Choice Analysis: Theory and Application to Travel Demand*. Cambridge, MA: MIT Press.
- Blumen, O. (1994). Gender Differences in the Journey to Work. *Urban Geography*, 15, 223-245. <https://doi.org/10.2747/0272-3638.15.3.223>
- Buehler, R. (2011). Determinants of Transport Mode Choice: A Comparison of Germany

- and the USA. *Journal of Transport Geography*, 19, 644-657.
<https://doi.org/10.1016/j.jtrangeo.2010.07.005>
- Cheng, L., Bi, X. Y., Chen, X. W., & Li, L. (2013). Travel Behaviour of the Urban Low-Income in China: Case Study of Huzhou City. *Procedia—Social and Behavioral Sciences*, 96, 231-242. <https://doi.org/10.1016/j.sbspro.2013.08.030>
- Colaço, J., & Serra, C. (1998). *Mentalidade “chapa 100” na cidade de Maputo*. Oficina de Sociologia.
http://www.mozambiquehistory.net/periodicals/estud_moc/15/colaco_em_15.pdf
- Couto, M., & Lawoko, S. (2011). Burnout, Workplace Violence and Social Support among Drivers and Conductors in the Road Passenger Transport Sector in Maputo City, Mozambique. *Journal of Occupational Health*, 53, 214-221.
<https://doi.org/10.1539/joh.L10102>
- Couto, M., Lawoko, S., & Svanström, L. (2009). Violence against Drivers and Conductors in the Road Passenger Transport Sector in Maputo, Mozambique. *African Safety Promotion: A Journal of Injury and Violence Prevention*, 7, 1-20.
<https://doi.org/10.4314/asp.v7i2.54593>
- Diaz Olvera, L., Plat, D., & Pochet, P. (2013). The Puzzle of Mobility and Access to the City in Sub-Saharan Africa. *Journal of Transport Geography*, 32, 56-64.
<https://doi.org/10.1016/j.jtrangeo.2013.08.009>
- Federhen, A. (2018). *Avaliação da motivação do uso de sistemas “partilha de viagem” como forma de transporte alternativo nas cidades de Maputo e Matola*. Master's Dissertation, Maputo: Eduardo Mondlane University.
- Gillen, D. (1977). Estimation and Specification of the Effects of Parking Costs on Urban Transport Mode Choice. *Journal of Urban Economics*, 4, 186-199.
[https://doi.org/10.1016/0094-1190\(77\)90022-5](https://doi.org/10.1016/0094-1190(77)90022-5)
- Godard, X. (2013). Comparisons of Urban Transport Sustainability: Lessons from West and North Africa. *Research in Transportation Economics*, 40, 96-103.
<https://doi.org/10.1016/j.retrec.2012.06.033>
- Goncalves, J., Gomes, M., & Ezequiel, S. (2017). Defining Mobility Patterns in Peri-Urban Areas: A Contribution for Spatial and Transport Planning Policy. *Case Studies on Transport Policy*, 5, 643-655. <https://doi.org/10.1016/j.cstp.2017.07.009>
- Gujarati, D. N. (2011). *Econometrics by Example*. New York: Palgrave Macmillan.
- Hakim, C. (2000). *Work-Lifestyle Choices in the 21st Century: Preference Theory*. Oxford: Oxford University Press.
- Hanson, S., & Johnston, L. (1985). Gender Differences in Work-Trip Length: Explanations and Implications. *Urban Geography*, 6, 193-219.
<https://doi.org/10.2747/0272-3638.6.3.193>
- Hartman, H. (1979). Capitalism, Patriarchy, and Job Segregation by Sex. In Z. R. Eisenstein (Ed.), *Capitalist Patriarchy* (pp. 206-247). New York: Monthly Review Press.
- Hu, L. (2020). Gender Differences in Commuting Travel in the U.S: Interactive Effects of Race/Ethnicity and Household. *Transportation*.
<https://doi.org/10.1007/s11116-020-10085-0>
- Israel, G. D. (1992) *Determining Sample Size* (pp. 1-5). Gainesville, FL: Institute of Food and Agricultural Sciences (IFAS), University of Florida, PEOD-6.
- JICA (2012). *Comprehensive Urban Transportation Master Plan for the Greater Maputo*. Final Report, Vol. 1 & 2, Master Plan Report.
- Jorge, S., & Melo, V. (2014). Processos e dinâmicas de intervenção do espaço peri-urbano:

- O caso de Maputo. *Cadernos de Estudos Africano*, 27, 55-77.
<https://journals.openedition.org/cea/1488>
<https://doi.org/10.4000/cea.1488>
- Klopp, J., & Cavoli, C. (2019). Mapping Minibuses in Maputo and Nairobi: Engaging Paratransit in Transportation Planning in African Cities. *Transport Reviews*, 39, 657-676.
<https://doi.org/10.1080/01441647.2019.1598513>
- Leão, C. (2012). *Passageiros. Caso: "Encurtamento de rotas na cidade de Maputo"*. BA's Dissertation, Maputo: Eduardo Mondlane University.
- Mabucanhane, N. (2018). Políticas, programas e projetos governamentais: Perspectiva conjuntural na busca de soluções ao problema dos transportes públicos. *Estudos IAT*, 3, 173-191.
- McDonald, H. (1999). Women's Employment and Commuting: Explaining the Links. *Journal of Planning Literature*, 13, 267-283.
<https://doi.org/10.1177/08854129922092397>
- Mendonça, I. (2014). Mobilidade urbana na área metropolitana de Maputo: Análise dos órgãos de gestão do planeamento e mobilidade urbana, arranjos institucionais e insumos para a sua efectiva articulação. *Journal of Transport Literature*, 8, 244-270.
<https://doi.org/10.1590/S2238-10312014000200011>
- Müller, S., Tsharaktschiew, S., & Hasse, K. (2008). Travel-to-School Mode Choice Modelling and Patterns of School Choice in Urban Areas. *Journal of Transport Geography*, 16, 342-357. <https://doi.org/10.1016/j.jtrangeo.2007.12.004>
- Ortúzar, J. D., & Willumsen, L. G. (2011). *Modeling Transport*. Hoboken, NJ: John Wiley & Sons, Ltd. <https://doi.org/10.1002/9781119993308>
- Oum, T. (1979). A Warning on the Use of Linear Logit Models in Transport Mode Choice Studies. *The Bell Journal of Economics*, 10, 374-388.
<https://doi.org/10.2307/3003339>
- Rosenbloom, S. (1978). Trends in Women's Travel Patterns. *Proceedings from the Second National Conference*, University of Arizona, 123-143.
- Salon, D., & Gulyan, S. (2019). Commuting in Urban Kenya: Unpacking Travel Demand in Large and Small Kenyan Cities. *Sustainability*, 11, 3823.
<https://doi.org/10.3390/su11143823>
- Scheiner, J., & Holz-Rau, C. (2012). Gendered Travel Mode Choice: A Focus on Car Deficient Households. *Journal of Transport Geography*, 24, 250-261.
<https://doi.org/10.1016/j.jtrangeo.2012.02.011>
- Seco, A., Bastos-Silva, A., & Matos, A. (2017). Políticas sustentáveis de transporte em áreas metropolitanas em países em desenvolvimento: O caso de Maputo. *Proceedings CLME2017/VCEM 8º Congresso Luso-Moçambicano de Engenharia/V Congresso de Engenharia de Moçambique*, Maputo, 4-8 Setembro 2017, 93-94.
- Sohail, M., Maunder, D. A. C., & Miles, D. W. J. (2004). Managing Public Transport in Developing Countries: Stakeholder Perspectives in Dar es Salaam and Faisalabad. *International Journal of Transport Management*, 2, 149-160.
<https://doi.org/10.1016/j.ijtm.2005.06.001>
- Srinivasan, S., & Rogers, P. (2005). Travel Behaviour of Low-Income Residents: Studying Two Contrasting Locations in the City of Chennai, India. *Journal of Transport Geography*, 13, 265-274. <https://doi.org/10.1016/j.jtrangeo.2004.07.008>
- Suguiy, T., de Carvalho, M., & Ferreira, P. (2020). Efficiency versus Satisfaction in Public Transport: Practices in Brazilian Cities. *Cases Studies in Transport Policy*, 8, 938-945.

<https://doi.org/10.1016/j.cstp.2020.05.003>

- Tara, S. (2011). Private Space in Public Transport: Locating Gender in the Delhi Metro. *Economic and Political Weekly*, 46, 71-74.
- Tembe, A., Nakamura, F., Tanaka, S., Miura, S., & Ariyoshi, R. (2017). Urban Travel Demand Analysis: A Case Study of Maputo, Mozambique. *Proceedings of the Eastern Asia Society for Transportation Studies*, Vol. 11.
<http://www.easts.info/on-line/proceedings/vol.11/head.htm>
- Tembe, A., Nakamura, F., Tanaka, S., Miura, S., & Ariyoshi, R. (2020). Travel Behavior of the Urban Poor: A Comparative Study between Maputo and Nairobi. *Transportation Research Procedia*, 48, 1478-1492. <https://doi.org/10.1016/j.trpro.2020.08.193>
- Tembe, A., Nakamura, F., Tanaka, S., Miura, S., & Ariyoshi, R. (2019). The Demand for Public Buses in Sub-Saharan African Cities: Case Studies from Maputo and Nairobi. *IATSS Research*, 43, 119-122. <https://doi.org/10.1016/j.iatssr.2018.10.003>
- Walby, S. (1990). *Theorizing Patriarchy*. London: Blackwell.
- Wen, C.-H., & Koppelman, F. (2000). A Conceptual and Methodological Framework for the Generation of Activity-Travel Patterns. *Transportation*, 27, 5-23.
<https://doi.org/10.1023/A:1005234603206>