Mobility of Care: An Exploratory Analysis in Montréal, Canada

Léa Ravensbergen
School of Urban Planning
McGill University
Email: lea.ravensbergen@mcgill.ca
orcid: 0000-0003-3259-6673

Juliette Fournier
School of Urban Planning
McGill University
Email: juliette.fournier@mail.mcgill.ca
orcid: 0000-0003-2770-0931

Ahmed El-Geneidy
School of Urban Planning
McGill University
Email: ahmed.elgeneidy@mcgill.ca
orcid: 0000-0002-0942-4016

Word Count: 5,565 words + 4 tables (4 * 250 words) + 4 figures (0 words) = 6565 words

Submitted September 30, 2021

For Citation Please use: Ravensbergen, L., Fournier, J., & El-Geneidy A. (2022). *Mobility of Care: An Exploratory Analysis in Montréal, Canada.* Paper to be presented at the Transportation Research Board 101st Annual Meeting.

Mobility of Care: An Exploratory Analysis in Montréal, Canada

ABSTRACT

Mobility of care refers to the daily travel required to complete care labour such as travel to the grocery store, or to escort children. Though past research has examined the distribution of individual types of household-serving travel, little research to date, especially in the North American context, has examined mobility of care which combines all travel required to fulfill a household's care needs. This paper presents the results of an exploratory analysis of mobility of care drawing on Montréal's 2018 Origin-Destination Survey. Specifically, we explore who completes this type of travel and how this mobility is completed. Findings indicate that mobility of care comprises 28% of adults' daily mobility. Further, women are found to complete more of this type of travel than men, especially women from lower-income households. The presence of children in the household further widens this gendered gap, though the number of children present does not alter this trend greatly. Mobility of care are shorter on average than other types of travel and are frequently completed as part of a trip-chain. Further, car use and active modes are more frequently used for mobility of care than other types of travel, while the opposite is true for public transport. The use of public transport for mobility of care trips is greater amongst women than men, especially those living in lower-income households. Taken together, results highlight the importance for practitioners to explicitly address mobility of care in transport planning, and particularly in public transport planning.

Keywords: Mobility of Care; Household-Serving Travel; Gender; Income; Public Transportation

INTRODUCTION

Coined by Sánchez de Madariaga (*1)*, mobility of care refers to all the travel required to perform care work, i.e. the "unpaid work carried out by adults having responsibility for children and other non-physically autonomous individuals, as well as those activities needed for the upkeep of the home" (p. 147). The concept was developed as a counterpart to mobility for paid employment. Though mobility for paid employment is well studied, mobility of care is rarely explicitly considered in urban transport planning. Trips linked to care activities such as grocery shopping and dropping off/picking up children are essential and must be made regularly. Further, preliminary evidence indicates that they comprise a large proportion of daily travel (*2*). In one study, the total number of trips made for the purposes of care is close to the total number of trips made for employment, at least amongst those within the age-range of having children (*2*).

Mobility of care may also warrant special consideration amongst transport planners aiming to reduce cities' carbon footprints by discouraging travel by car for frequent trips and encouraging more sustainable travel modes. Preliminary research has found that this type of travel may be considered easier to complete by car than by more sustainable modes such as walking, cycling, and public transport because mobility of care tends to include carrying items (groceries, library books, etc.) or children (*3*). Therefore, a careful consideration of mobility of care is required in policies aiming to encourage sustainable mobility.

Mobility of care are also important when it comes to transport equity. Past research looking at the distribution of household-serving travel has found that it is disproportionately completed by women (*4-7*) and preliminary work examining mobility of care, the sum of all household-serving travel, has also found this trend (*1; 2*). Therefore, considerations of mobility of care may be integral to gender-mainstreaming in urban planning. This paper contributes to the nascent literature on mobility of care by presenting the results of an exploratory analysis in Montréal, Canada. Drawing on the 2018 Origin-Destination Survey, this study quantifies mobility of care and examines who completes this type of mobility, as well as how people travel for care purposes.

LITERATURE REVIEW

The gendered distribution of household labour received ample attention in the literature. Women today tend to be responsible for more household labour than men in many geographic contexts; even though their participation in paid employment has grown over time (*8*). For instance, in the United States, women spend 27 hours per week on average doing unpaid household work, compared to men's 16 hours per week (*9*). In Quebec, women and men spend similar amounts of time being 'active', i.e., executing paid or unpaid work in a day (7.7 hours for women vs. 7.5 hours for men). However, women and men spend this 'active' time differently: women spend more time on average completing domestic chores (3.8 hours per day vs. 2.6 hours) while men spend more time on average working (4.9 hours per day vs. 3.9 hours) (*10*). Because many aspects of household labour require travel, this disproportionate distribution of domestic work has been argued to contribute toward gendered differences in travel behaviour.

Research has examined the gendered distribution of household-serving travel. For instance, studies have found that women make more shopping trips (*5*) and run more errands (*4*) than men. Further, children are at least five times more likely to travel with their mothers than with their fathers (*6*). Women have also been found to escort their grandchildren more than men (*7*) and to complete the bulk elder care (*11*), which would likely result in more travel for care purposes. Finally, women have been found to be responsible for planning mobilities of care, even when a male partner undertakes them (*12*). Of course, gender does not exist in isolation, but intersects with other aspects of difference such as class, race, age, and ability (*13*). Though many studies have found gendered discrepancies in household-serving travel, less research has examined how these travel characteristics vary across intersecting axes of identity. We address this research gap in this paper by considering the distribution of mobility of care across gender and income.

Further, though a large body of work examined household-serving travel, research have only recently begun to consider mobility of care. Research on mobility of care differentiates from that on household-serving travel as it considers all care trips as a whole instead of considering different care trips individually. In doing so, it highlight the sheer significance of this type of travel, travel that Sánchez de Madariaga (*1)* argues is under-quantified, undervalued, and rendered invisible due to gender bias in the way we gather, interpret, analyze, and visually represent travel data. Research on mobility of care has examined the challenges – as well as the opportunities - of completing this type of travel by bicycle (*14-16*). Other research has examined mobility of care amongst older adults (*17*), some of which considers the burden of this mobility on both care recipients and care givers (*18*). Finally, an Australian paper argues that major transport investments are built and planned to benefit commuting patterns, a prioritization that hinders child-friendly mobility and mobility of care (*19*).

Beyond seminal pieces by Sánchez de Madariaga (*1; 2*), little work has quantified mobility of care, none of which is set in the North American context. Further, the trip characteristics of this mobility has yet to be examined. Also, while women have been found to complete more mobility of care than men, little work how the distribution of mobility of care varies across gender and other axes of identity, a research gap recently outlined by Grant-Smith (*19)*. We address these research gaps in this study by quantifying mobility of care in a North American city and exploring who completed this care across gender and incomes as well as how they make care trips.

DATA AND METHODS

This study uses data from the 2018 Montréal Origin Destination (OD) Survey, the most recent publicly available edition (*20*). Conducted every five years since 1970, the Montréal OD Survey is a large-scale travel survey completed by a random sample of five percent of the Montréal population. Respondents provide information on their household (location, number of residents, car ownership, income), their household's occupants (age, gender, driver's license ownership, etc.), and are asked to detail each resident's travel behaviour over the preceding 24-hour week-day period (origin, destination, time of departure, motive, and mode for each trip). The OD contains more than 360,000 trips. The analysis for this study focuses on trips conducted by

individuals between 25 and 60 years old. This age group was selected because people in this age-range are more likely to perform care labour, rather than benefit from others' care.

The first step of the analysis involved quantifying mobility of care from the OD Survey. Here, we followed Sanchez de Madariaga (*2)*'s method where two thirds of trips labeled as shopping, one third of trips with the motive "visiting someone" and all the trips with motive "health", "pick up someone" and "accompany someone" are considered mobility of care. Though this method provides only an approximation of mobility of care, previous research has developed survey methodology to capture actual mobility of care and found that the original method used by Sanchez de Madariaga (*2)* closely resembles actual mobilities of care.

Once care trips were identified, we analyzed how they were distributed across gender, income, and presence of children in the household. Although gender is more complex than the male/female binary, Montréal's OD survey only allows these two options. Therefore, we had to rely on these over simplistic categorizations in this paper. The decision was made to identify male-female differences in all types of households (i.e., single parent, and multi-parent (i.e., 2+ adults, regardless of sex/gender composition) households). This was done to avoid heteronormative assumptions about two-parent households. When assessing how the presence of children influenced mobility of care, we only considered children 12 years of age and under because previous research has found that children in this age-range are more dependent on their parents to meet their travel needs (*21*).

Then, the ways in which residents complete this type of mobility was analyzed. Here, we investigated travel mode, trip duration, and whether the trip was part of a chain or not. Travel mode was provided in the OD Survey. Trip duration, on the other hand, was generated using the R statistical software program *r5r* (*22*). The OD Survey provided each journey's departure time. All trips were generated on the same date, a random non-holiday weekday in 2018 meant to represent typical travel conditions. For car trips, local speed limits were obtained from Open Street Maps. Because this did not include congestion, a linear regression model was calculated based on a sample month of trips (February 2020) in Montréal with congested times generated by the Google API to apply a congestion factor. For public transit trip durations, public transit providers operating during the OD survey time period's General Transit Feed Specification (GTFS) feeds were acquired from the Open Mobility Website. Finally, we defined trip chains based on spatial location. Trip-chains are defined as instances where a succession of trips occurred (at least two) where the first trip begins, and last trip ends at the home location. For example, a parent accompanying their child from home to school in the morning, then going directly to work, followed by picking up groceries on their way home from work was considered a chain of 3 trips (accompanying someone, work, and shopping).

RESULTS

This results section contains two sub-sections. The first quantifies mobility of care and explores who complete these trips. The second examines how these trips are completed by exploring trip mode, length, and whether the trips are part of a chain or not.

Who Completes Mobility of Care?

Following the method put forth by Sanchez de Madariaga (*2)*, results indicate that 28% of daily trips comprise mobility of care (Figure 1). When the sample is expanded to the population of Montréal adults aged between 25 to 60 years old, mobility of care represents 915,000 daily trips. Mobility of care therefore comprise three times the number of trips than those for leisure and only 20% less than those for work. The bulk of care trips (60%) involve escorting others (accompanying someone or picking someone up). Of these trips, men made 41.8%, leaving the rest, 58.2%, to women. These results confirm that mobility of care is not distributed equally amongst men and women.

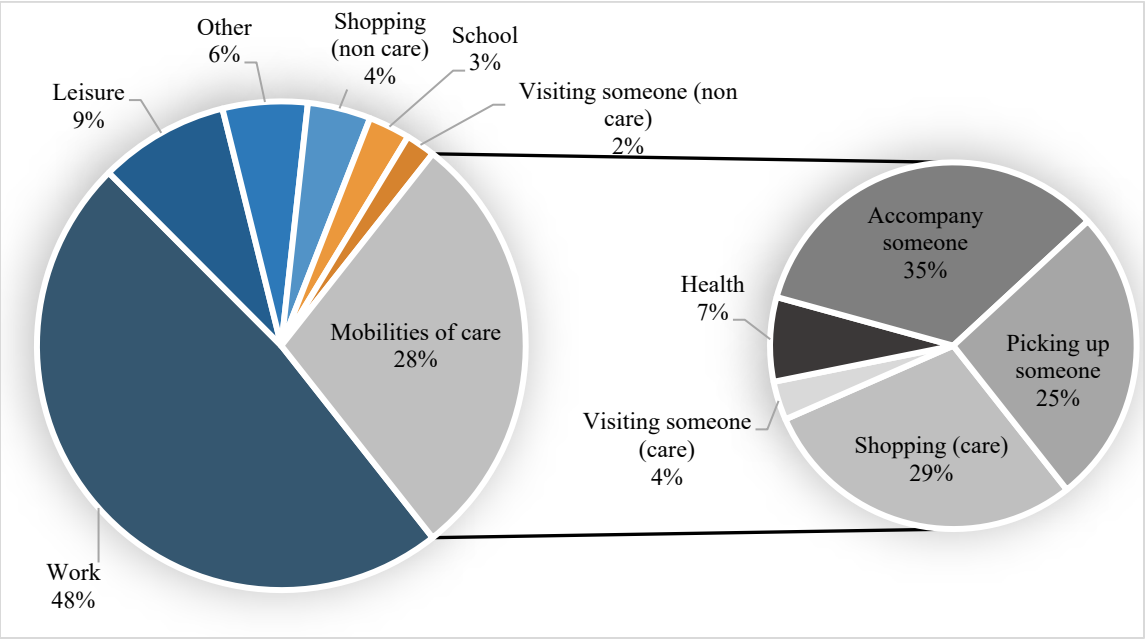

Figure 1- Summary of Daily Mobility (adults between 25 and 60 years old)

Figure 2 highlights the distribution of men and women's travel by trip purpose. Though all trip purposes vary by gender at $p < 0.05$, major differences exist when it comes to work and mobility of care. Namely, mobility of care represents 32% of women daily mobility and 25% for men. Travel to and from work, on the other hand, comprises 52% of men's mobility, compared to 44% of women's mobility.

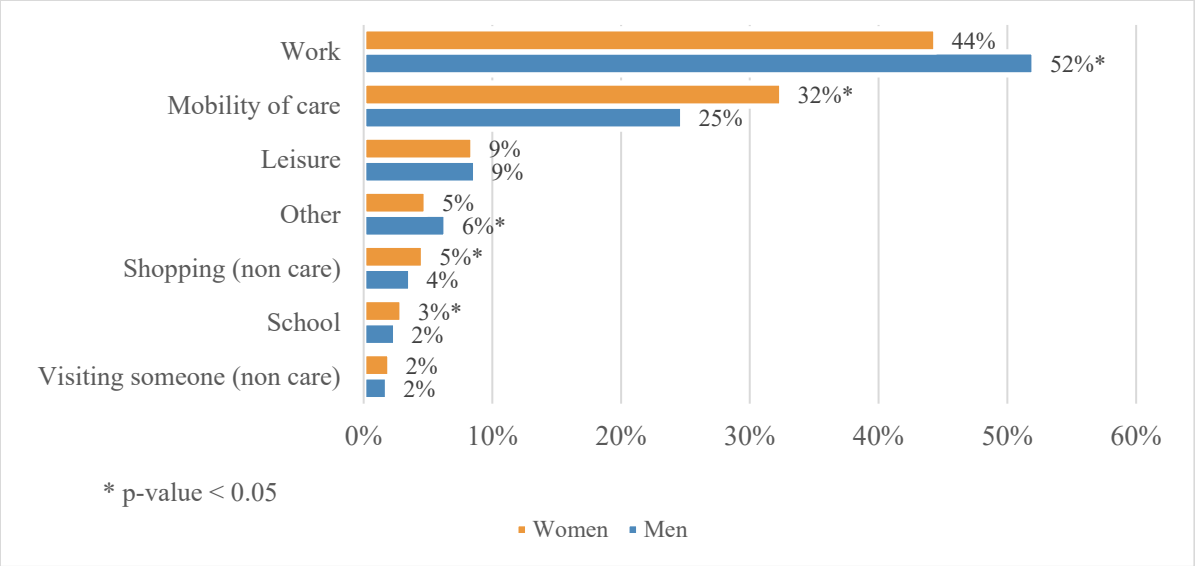

Figure 2: Daily Mobility Trip Purpose by Gender

The exploratory analyses revealed that gender was not the only social factors that influences the distribution of mobility of care. Indeed, the intersection of gender and income revealed an interesting pattern. Namely, as household income increases, the division of care trips becomes more equitable (Figure 3). In lower income households ($60,000 and lower), women complete 50% more care trips than men. This gap reduces to 22% in households earning $150,000 or more.

Figure 3: Proportion of Care Trips Between Gender by Household Income

Finally, the presence of children in the household was also found to influence the proportion of daily travel that comprises mobility of care (Table 1). In fact, having at least one child in the household doubles the share of mobility of care trips (20% to 42%). A gradient in mobility of care exists whereby additional children in the household result in higher shares of mobility of care. In fact, care trips represent 38% of adult's mobility in households with one child. A second child increases this share to 45% (an increase of 7%). However, the presence of more than three children only increases this share by 2%.

Table 1 Percentage of Daily Trips Dedicated to Care by Number of Children (≤12 years) and Household Income

	All Incomes	**≤ $ 59,999**	**$60,000 - $150,000**	**≥ $ 150,000**
Households without children	19.78%	22.18%	18.91%	18.67%
Households with at least one child	42.22%	45.40%	42.04%	39.97%
1 Child Households	37.79%	40.81%	37.53%	35.40%
2 Child Households	44.81%	49.05%	44.44%	42.63%
3+ Child Households	47.12%	49.07%	47.25%	43.34%

Children were also found to influence the gendered distribution of mobility of care (**Error! Reference source not found.**). Simply put, the gendered distribution of mobility of care gap widens when there are children in the home. Compared to households without children, women in households with one child complete 5% more of the mobility of care while men do 5% less resulting in a 10% difference in care trips. Interestingly, the number of children in the household does not influence this gendered division greatly. In fact, the burden of care trips on women does not change significantly when there is one or three children in the household (61.39% vs 61.75%).

Income plays a role here again: households with children and the highest incomes have the smallest gendered gaps in mobility of care while those with the lowest incomes have the largest (**Error! Reference source not found.**). Indeed, women living in households with at least 1 child under 12 and household incomes under 30,000$ make 68% of the care trips. Women in the same situation but in households earning $150,000 or more make 10% less mobility of care (58%). Income also influences the share of care trips in daily mobility. In households with higher incomes, mobility of care represents a lower portion of adults' daily mobility, no matter the number of children. For example, in households with at least one child, care trips share decreases

from 45.50% in households with lower incomes to 40% in households with higher incomes (**Error! Reference source not found.Error! Reference source not found.**).

Table 2 Gendered Distribution of Mobility of Care by Presence of Children (≤12 years) and Household Income

	All Incomes		**< $60,000**		**$60,000 - $150,000**		**≥ $150,000**	
	Women	**Men**	**Women**	**Men**	**Women**	**Men**	**Women**	**Men**
Households without children	55.15%	44.85%	55.68%	44.32%	53.97%	46.03%	51.58%	48.42%
Households with at least one child	60.30%	39.70%	64.68%	35.32%	59.26%	40.74%	56.66%	43.34%
1 Child Households	61.39%	38.61%	67.76%	32.24%	58.21%	41.79%	57.98%	42.02%
2 Child Households	58.96%	41.04%	64.22%	35.78%	58.28%	41.72%	55.72%	44.28%
3+ Child Households	61.75%	38.25%	59.03%	40.97%	64.69%	35.31%	56.96%	43.04%

How are Care Trips Made?

With regards to mode share, mobility of care trips are more frequently made by car and with active modes than by public transport (Table 3). Indeed, car use is 7.62% higher for care trips than for work trips, regardless of gender. Further, the use of active modes of transport (walking and cycling) is approximately two times greater for care trips than work trips. However, public transport use for care trips is 2.5 times lower than for work trips. While little difference was identified between men and women's use of active modes for mobility of care, women were found to complete a greater proportion of both work and care trips by transit and a lower proportion by car than men ($p < 0.05$).

Table 3 - Mode share of work and care trips by gender

	Car		Public transportation		Active transportation	
	Care trips	Work trips	Care trips	Work trips	Care trips	Work trips
WOMEN	81.60%	73.41%	6.42%*	20.00%*	11.37%*	5.94%†
MEN	83.29%*	75.83%*	4.96%	17.55%	11.11%	5.93%
TOTAL	82.30%	74.68%	5.81%	18.72%	11.26%	5.93%

* Differences between men and women are statistically different (p-value < 0.05)
† Differences between men and women not statistically different (p-value > 0.05)

Though public transport is less commonly used for mobility of care than cars or even active travel modes, Figure 4 demonstrates income disparities in public transport use for this type of travel. Namely, as income increases, the use of public transport for care trips decreases. This is most pronounced for adults living in households with incomes lower than $30,000 per year. These lower income residents use public transport for mobility of care almost three times as much those earning higher incomes (14% vs. 5%). Further, no matter the household income, women use public transport to complete care trips more than men ($p < 0.05$). While this gendered division in public transport use for mobility of care exist across all income groups, the disparity is far larger amongst lower income households where women make 5% more care trips using public transport than men (16% vs. 11%).

Figure 4: Share of Public Transport Used for Care Trips by Income and Gender

In terms of trip duration, care trips were found to be shorter than all other trips. In fact, Montréalers spend an average of 16 minutes by car (congestion time taken into account) to

complete care trips compared to 25 minutes, which is the average duration of all other trips. This trend was identified for trips using public transport as well, where the average trip for care purposes was 6 minutes shorter than those for all other purposes (36 vs. 42 minutes). Differences in trip length by gender and the presence of children in the household are not reported herein as none were identified.

Over half of mobility of care trips (59.55%) are part of a trip chain, i.e., people frequently combine travel for car with travel for other purposes. When comparing care trips made as part of a chain and those not part of a chain, it becomes evident that completing care trips in chains increases the use of car and public transport and decreases the active transport use (Table 4). This trend is starker for car use which increases by 7% and active travel which decreases by 8%. Gendered differences in mode share were identified as well (Table 4). For instance, 16.44% of women's work trips are part of a chain which includes at least one care trip compared to 12.28% for men. Consequently, women are 34% more likely than men to achieve at least one care trip on their way to (or from) work. When completing care trips as part of a chain, men were more likely to use a car while women were more likely to use public transport and active transport, though the latter difference is minor ($p < 0.05$).

Table 4: Mode share of chained and not chained care trips

	Care trips not part of a chain			**Care trips part of a chain**		
	Car	Public transportation	Active transportation	Car	Public transportation	Active transportation
WOMEN	77.38%	5.50%*	16.27%*	84.44%	7.05%*	8.07%*
MEN	79.07%*	4.21%	15.82%	86.18 %*	5.47%	7.89%
TOTAL	78.09%	4.96%	16.08%	85.28%	6.40%	8.00%

* Differences between men and women are statistically different (p-value < 0.05)

DISCUSSION AND CONCLUSION

This paper quantifies mobility of care, the travel required to perform unpaid labour for care purposes, in Montréal and explores who carries out this mobility as well as how this type of travel is completed. Drawing on the 2018 OD survey, results indicate that mobility of care make up a significant portion of daily travel. Indeed, 28% of Montréal adults' daily trips comprise mobility of care. This represents almost one million trips (915,000) made every day and is the second most common form of travel after commuting to and from work (48% of daily mobility). This result highlights the importance of formally incorporating this type of mobility into transport research and planning. As Sánchez de Madariaga (*1)* stipulated, when we combine the different types of trips that make up of mobility of care, it becomes clear that travel for unpaid care labour is an important aspect of daily mobility.

Further, we find that the division of mobility of care is inequitable. Results support previous work that has found that women complete the bulk of household-serving trips (*4-7*) and mobility of care (*1; 2*). In Montréal, we find that 58.2% of all daily mobility of care trips are completed by women. In other words, adult women complete 150,060 more daily care trips than men. This inequality was also found proportionally where mobility of care was found to represent 32% of women's daily trips compared to 25% of men's trips. These findings are consistent with the time working aged (25-54 years old) men and women spend per day fulfilling paid (5 vs. 3.9 hours respectively) and unpaid (2.6 vs. 3.8 hours) work in Quebec (*23*).Therefore, a correlation appears to exist between time spent in paid and unpaid labour, and time spent traveling for that labour.

The presence of children in the household was also found to influence mobility of care. Namely, the gendered distribution of this type of travel is more inequitable in households with children than those without. This finding is supported by previous work finding that mothers escort their children at far higher rates than fathers (*6*). Interestingly, women do a greater proportion of mobility of care when there are children in the household, but the number of children present barely changes this division of mobility of care. Therefore, having children seems to be the determining factor in the distribution of mobility of care, rather than the number of children present in the household.

Beyond identifying a gendered distribution in mobility of care, we also find that gender intersect with other aspects of identity to influence participation in this form of travel. Namely, when considering the distribution of mobility of care across gender and income, it became apparent that the gendered gap in the distribution of mobility of care was twice as large in low-income households than high income households. While this gendered gap was largest in households earning less than $60,000, an income gradient in the distribution of care work exists whereby men and women's participation in this mobility narrows as income increases. This income gradient was also found when considering the distribution of mobility of care in households with and without children. Taken together, women from lower income households do a greater proportion of mobility of care, especially when children are present in the household.

Future work can examine why income influences the gendered distribution of mobility of care. Perhaps higher income households can afford hiring help to complete mobility of care (it is interesting to note that this labour would likely be completed by women from lower-income households). These results highlight the importance of considering gender in an intersectional way: the mobility experiences of women vary across other axes of social difference. Because only gender and income are considered in this paper, we call for more research considering how the distribution of mobility of care varies not only by income, but by other identities including race and ethnicity, age, and (dis)ability. For instance, examining older adults' mobility of care might be of interest, as retirement, or the discontinuation of the commute to work, may result in a greater proportion of one's daily travel compromising mobility of care.

Further, while this paper highlights the uneven distribution of mobility of care across gender and income, it does not explore the social factors underpinning this inequality. Future research examining why this type of travel falls disproportionately on women, especially women from lower-income households is needed. For instance, research could examine the socialization of

care labour. Further, this paper relies on the male/female gender binary, a categorization that was self-reported in the OD survey. Because gender is not a simple binary, we call for more research examining the ways in which mobility of care are distributed across more varied gender identities.

Beyond examining who completes mobility of care, we also analyzed how this type of mobility is completed. Travel by car was found to be the most common mode used to complete mobility of care. In fact, the proportion of trips completed by car for mobility of care was greater than those completed for work purposes. Further, an even greater proportion of mobility of care are completed by car when completed as part of a trip chain. Given that the bulk of mobility of care (89% of total) comprises accompanying someone, picking someone up, and shopping for care purposes (Figure 1), and that these trips involve carrying items (i.e., shopping) or escorting people (accompanying or dropping off), perhaps they are considered easier to complete by car than by other modes. Indeed, support for this hypothesis has been found in a recent Spanish study (*3*).

Results also show that public transport is proportionally used twice as frequently for work trips than for mobility of care. Future work can examine the distribution of mobility of care across different types of public transport. For instance, perhaps bus use is more common for this type of travel than subway or light rail due to the closer distances between bus stops. Results also indicate that care trips are shorter than those for other purposes. Short trips are often put forth as ideal trips to complete using sustainable modes such as public transport. This highlights the importance of including considerations of this type of mobility in sustainable transport planning. Further, the use of public transport for care trips was highest amongst lower income households. Given that traveling by public transport is less expensive than by car, this may indicate that those who use public transport for mobility of care do so for cost-saving purposes rather than out of convenience. This highlights the importance of making public transport the easy and most convenient choice for these short care trips.

In this research we not only found that mobility of care comprises a significant proportion of individuals' daily travel, but that women, and low-income women in particular, complete a greater proportion of these trips. Mobility of care trips likely differ from other trips. We found that they are shorter than the average trip to work, and they likely also take place closer to the home, in the company of children, and/or involve carrying items (e.g., groceries). Therefore, it is important that practitioners explicitly consider this significance form of travel with unique needs in transport planning. For instance, rather than focus on the trip to work as the de facto destination in travel models, researchers can instead explore modelling with care-locations destinations.

Further, people use public transport less, and cars and active modes more, to complete mobility of care than the commute to work. Therefore, public transport practitioners, in particular, should plan for this type of travel. This might involve re-considering where public transit routes and stops are located to improve accessibility to locations where care activities occur. Indeed, access to jobs is the usual destination used when generating accessibility metrics. Perhaps shifting toward different types of destinations, such as locations where care takes place (e.g., daycares,

grocery stores, schools), would result in accessibility metrics that better represent women's travel needs.

Additionally, payment systems that charge two fares when passengers trip chain disproportionality financially burden women, especially low-income women, as they complete mobility of care (an already unpaid form of labour). Charging fares according to travel time rather than travel routes (e.g., one fare for every 2hrs travelling on the system rather than every continuous trip) would make trip-chaining using transit more cost effective. Further, public transit designs that accommodate children, strollers, and carrying items might make mobility of care using public transport more convenient and encourage people to complete this travel by public transport. Doing so would not only promote sustainable travel in the city; it would also benefit women, and low-income women in particular, who complete the bulk of mobility of care. Increased attention to and considerations of mobility of care may answer recent calls to integrate gender equity in urban planning (24; 25).

ACKNOWLEDGEMENTS

The authors would like to thank Pegah Nouri from the Autorité Régionale de Transport Métropolitain (ARTM) for providing access to the OD-survey used in the analysis. This research was funded by the Natural Sciences Research Council of Canada (NSERC) project number RGPIN-2018-04501.

AUTHOR CONTRIBUTION

The authors confirm contribution to the paper as follows: study conception and design: Ravensbergen, Fournier, & El-Geneidy; data collection: Fournier; analysis and interpretation of results: Ravensbergen, Fournier & El-Geneidy; draft manuscript preparation: Ravensbergen, Fournier, & El-Geneidy. All authors reviewed the results and approved the final version of the manuscript.

WORKS CITED

[1] Sánchez de Madariaga, I. Mobility of Care: Introducing New Concepts in Urban Transport.In *Fair Shared Cities: the Impact of Gender Planning in Europe*, 2013.

[2] Sanchez de Madariaga, I., Zucchini, E. . Measuring Mobilities of Care, a Challenge for Transport Agendas.In *Integrating Gender into Transport Planning*, 2019.

[3] Maciejewska, M., Miralles-Guasch, C. . "I Have Children and Thus I drive": Perceptions and Motivations of Modal Choice Among Suburban Commuting Mothers. *Finisterra,* Vol. 110, 2019, pp. 55-74.

[4] Root, A. Women, travel, and the idea of 'sustainable transport'. *Transport Reviews,* Vol. 20, No. 3, 2000, pp. 369-383.

[5] Sweet, M., and P. Kanaroglou. Gender differences: The role of travel and time use in subjective well-being. *Transportation Research Part F: Traffic Psychology and Behaviour,* Vol. 40, 2016, pp. 23-34.

[6] McDonald, N. Exploratory analysis of children's travel patterns. *Transportation research record,* Vol. 1977, No. 1, 2006, pp. 1-7.

[7] Plyushteva, A., and T. Schwanen. Care-related journeys over the life course: Thinking mobility biographies with gender, care and the household. *Geoforum,* Vol. 97, 2018, pp. 131-141.

[8] Schwanen, T. I., M. P. Kwan, and F. Ren. The Internet and the gender division of household labour. *The Geographical Journal,* Vol. 180, No. 1, 2014, pp. 52-64.

[9] Krantz-Kent, R. Measuring time spent in unpaid household work: results from the American Time Use Survey.In *Monthly Labour Review*, U.S. Bureau of Labor Statistics, 2009. pp. 46-59.

[10] Statistique Canada. Tableau 45-10-0014-01 Moyenne de temps consacré en heures par jour à diverses activités par groupe d'âge et sexe, 15 ans et plus, Canada et provinces.In, 2017.

[11] Smith, P. Elder care, gender, and work: The work–family issue of the 21st century. *Berkeley Journal of Employment and Labor Law,* Vol. 25, No. 2, 2004, pp. 351-399.

[12] Schwanen, T. Gender differences in chauffeuring children among dual-earner families. *The Professional Geographer,* Vol. 59, No. 4, 2007, pp. 447-462.

[13] Crenshaw, K. Demarginalizing the intersection of race and sex: A black feminist critique of antidiscrimination doctrine, feminist theory and antiracist politics. *u. Chi. Legal f.*, 1989, p. 139.

[14] Ravensbergen, L., R. Buliung, and S. Sersli. Vélomobilities of care in a low-cycling city. *Transportation research. Part A, Policy and practice,* Vol. 134, 2020, pp. 336-347.

[15] Sersli, S., M. Gislason, N. Scott, and M. Winters. Riding alone and together: Is mobility of care at odds with mothers' bicycling? *Journal of Transport Geography,* Vol. 83, 2020.

[16] Montoya-Robledo, V., L. Montes Calero, V. Bernal Carvajal, D. Galarza Molina, W. Pipicano, A. J. Peña, C. Pipicano, J. López Valderrama, M. Fernández, I. Porras, N. Arias, and L. Miranda. Gender stereotypes affecting active mobility of care in Bogotá. *Transportation Research Part D: Transport and Environment,* Vol. 86, 2020, p. 102470.

[17] Croucher, K., R. Gilroy, M. Bevan, and K. Attuyer. The mobilities of care in later life: exploring the relationship between caring and mobility in the lives of older people. *Ageing and Society,* Vol. 41, No. 8, 2021, pp. 1788-1809.

[18] Werner, S., G. Auslander, N. Shoval, T. Gitlitz, R. Landau, and J. Heinik. Caregiving burden and out-of-home mobility of cognitively impaired care-recipients based on GPS tracking. *International Psychogeriatrics,* Vol. 24, No. 11, 2012, pp. 1836-1845.

[19] Grant-Smith, D., Osborne, N. & Johnson, L. . Managing the challenges of combining mobilities of care and commuting: an Australian perspective. *Community, Work & Family,* Vol. 2, No. 2, 2016, pp. 201-210.
[20] Agence métropolitaine de transport. Enquête origine–destination, 2018.In, Montréal, 2018.
[21] Zwerts, E., D. Janssens, and G. Wets. How the presence of children affects parents' travel behavior.In *Transportation Research Board 86th Meeting, Washington, No. 2125*, Citeseer, 2007.
[22] Pereira, R. H. M., M. Saraiva, D. Herszenhut, C. K. V. Braga, and M. W. Conway. r5r: Rapid Realistic Routing on Multimodal Transport Networks with R5 in R. *Transport Findings*, 2021.
[23] Canada, S. Tableau 45-10-0014-01 Moyenne de temps consacré en heures par jour à diverses activités par groupe d'âge et sexe, 15 ans et plus, Canada et provinces.In, 2017.
[24] Damyanovic, D., and B. Zibell. Is there still gender on the agenda for spatial planning theories?: Attempt to an integrative approach to generate gender-sensitive planning theories. *disP - The Planning Review,* Vol. 49, No. 4, 2013, pp. 25-36.
[25] Scholten, C., and T. Joelsson. Integrating gender into transport planning : From one to many tracks.In, Springer International Publishing, Cham, 2019.