



# Regionalization and Recent Immigrants' Access to Jobs: An Analysis of Commuting in Canadian Metropolitan Areas

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## ABSTRACT

Examining the transportation modes used to commute by the growing numbers of immigrants locating in medium and small metropolitan areas, this study investigates the social geographies of mobility inequality, the uneven distribution of transportation burdens and benefits. Using microdata from the 2016 Census of Canada, we compare immigrants' propensity to commute by car, transit, and active modes (cycling and walking) among large, medium, and small metropolitan areas and we analyze the varying determinants of commuting mode in each context. In every metropolitan context, recent immigrants are more likely than established immigrants and the Canadian-born to commute on transit or by active modes. Although recent immigrants' use of public transportation declines from large to medium and small metropolitan areas, social differentials in reliance on public transportation persist. Women, workers who are not married, people who identify as non-White and non-Aboriginal and workers who do not have dependent children use transit and active modes more than other workers. Recent immigrant women's reliance on alternative modes is striking in metropolitan areas of all sizes. The findings indicate that policies encouraging immigrants to settle in medium and small metropolitan areas should also include investments in public transportation and pedestrian-friendly environments to reduce mobility inequality and enhance equitable access to employment.

## 1. Introduction

Limited transportation access restricts the mobility of many immigrants, especially recent immigrants (Blumenberg, 2009; Newbold et al., 2017; Farber et al., 2018; Reid-Musson, 2018). The issue has urgency at the current time when many countries of the Global North are seeing significant shifts in the spatial distributions of immigrant populations from transit-rich, high-density areas to suburban and rural locations where the principal transportation mode is the car (OECD, 2022). In this study, we examine how the dispersion of immigrants in Canada, from large gateway cities to small and medium-sized metropolitan areas affects their reliance on transit and other modes for commuting. Although immigrants' dependence on transit is well established (Heisz and Schellenberg, 2004; Newbold et al., 2017; Harun et al., 2021; Preston et al., 2022), less is known about disparities across metropolitan areas and their impacts on immigrant men and women. We ask what happens when immigrants live in low-density car-oriented metropolitan areas with limited public transportation that impede use of non-car modes.

Although the dispersion of immigrants, often described as

regionalization, is thought to facilitate their employment and improve access to affordable housing, observers also acknowledge that the supports and infrastructure to facilitate settlement are often in short supply outside the gateway cities (Wilkinson et al., 2016; Belkhdja, 2017; Hanley, 2017; Fang et al., 2018; Esses and Carter, 2019). This is especially true for crucial transportation infrastructure that enables mobility. In small and medium metropolitan areas, auto-oriented infrastructure predominates, public transportation is limited, and low-density land uses are likely to render transit and active modes such as walking and bicycling time-consuming and even unsafe (Reid-Musson, 2018). We examine the potential impacts of regionalization on immigrants' geographical access to jobs, a crucial aspect of wellbeing, by investigating the commuting modes of recent immigrants and their determinants in small, medium and large metropolitan areas, defined on the basis of population size. Like all travel, commuting has multiple aspects. Some recent research (McAlpine and Piszczek, 2022; Pinduk et al., 2023) indicates that commuting may offer a welcome transition between the demands of the workplace and the residence, although most literature still emphasizes the undesirable aspects of commuting

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(Murphy et al., 2022), a view that underpins our analysis. The analysis extends current understandings of immigrants' mobility inequality in two directions. We focus on alternatives to commuting by car: active commuting that includes walking and bicycling and public transit comprising buses, subways, light rail, and rail. We also provide a spatial analysis by comparing immigrants' commuting modes and their determinants across three types of metropolitan areas: the historic gateway cities, Canada's largest metropolitan areas, and medium, and small metropolitan areas.

We situate the analysis within a mobility inequality perspective that emphasizes the uneven distribution of the benefits and burdens of transportation plans and projects (Hidayati et al., 2021). Mobility inequalities emerge from "intrinsic", person-level factors and processes, and "extrinsic", contextual factors and processes, and the intersections and interactions among them (Hidayati et al., 2021). Immigrants' commuting modes are influenced by personal and household characteristics including gender, and length of residence in Canada, as well as the metropolitan setting in which the immigrant lives. With residential areas, workplaces, and other services and amenities spread out over long distances and limited public transportation systems, travel by any means other than car can be time-consuming and difficult in many Canadian metropolitan areas. We compare recent immigrants' reliance on various modes for commuting with that of established immigrants and Canadian-born and evaluate the impacts of personal and household characteristics on commuting mode in three metropolitan settings where public transportation systems, land use densities, and infrastructure for alternative commuting modes such as walking and cycling differ (Gilmore, 2019).

## 2. Background

### 2.1. Immigrant Settlement in Canada

More than a third of immigrants who arrived in Canada between 2006 and 2016, 35.3%, settled in medium and small metropolitan areas (Statistics Canada, 2017b). Their individual decisions to locate outside the three gateway cities are due to many factors but two stand out: job growth outside large metropolitan areas (Jeram and Nicolaidis, 2019) and government policies that promoted immigrant settlement in medium and small metropolitan areas. Since the 1990s, Canadian provinces and territories have taken more control of selecting and recruiting immigrants (Leitner and Preston, 2011; Akbari and MacDonald, 2014; Paquet and Xhardez, 2020), mainly through individual agreements with the Canadian federal government that allowed them to select some economic immigrants (Baglay and Nakache, 2014; Jeram and Nicolaidis, 2019). The numbers of permanent residents recruited directly by provinces and territories has increased steadily, accounting for more than 20 percent of all permanent residents admitted to Canada in 2019 (Immigration, Refugees, and Citizenship Canada 2020). In several small provinces, the provincial territorial program is the most important route for recruiting immigrants, accounting for 76.4%, 71.6%, and 65.0% respectively of all immigrants admitted to Prince Edward Island, Saskatchewan, and Manitoba, in 2018 (Paquet and Xhardez, 2020). Policymakers have also encouraged immigrants to disperse to small and medium-sized metropolitan areas within provinces. For example, in Quebec, provincial governments funded recruitment campaigns and service providers to attract and retain immigrants in metropolitan areas outside Montreal (Simard, 1996; Hanley, 2017).

As regionalization took hold, researchers documented the limited availability of supports for immigrants outside the gateway cities. In St. John's, Newfoundland and Labrador, service providers did not have sufficient funding to serve high-need refugees (Fang et al., 2018). A recent survey of immigrants in small urban centers and rural areas of Western Canada underscored immigrants' limited access to language training, settlement services, culturally sensitive health services, and, crucially from our perspective, public transportation (Wilkinson et al.,

2016).

Immigrants' access to transportation is key to finding a job, accessing essential services, building a new social network, and fostering social interaction (Farber et al. 2018). Economic constraints and lack of driver's licenses limit car ownership among immigrants, increasing their reliance on alternative modes such as public transit, cycling, and walking. Repeated studies (Heisz and Schellenberg, 2004; Newbold et al., 2017; Harun et al., 2021; Preston et al., 2022) confirm the significance of public transit for immigrants, especially during the first ten years of residence in Canada. Immigrants' reliance on transit diminishes over the first decade of residence in Canadian cities as the commuting modes of Canadian-born and immigrant workers converge, a process known as transportation assimilation (Heisz and Schellenberg, 2004). The same is true for active commuting. Although recent immigrants are more inclined than the Canadian-born to walk or bike to work (Yu and Teschke, 2018), this tendency declines during immigrants' first decade in Canada (Newbold et al., 2017). Reliance on alternative modes, especially during their first decade in Canada, affects every aspect of immigrants' work trips from commuting time to the predictability of commuting schedules, the ease with which workers can combine domestic chores and recreation with commuting, and the perceived comfort and safety of work trips.

### 2.2. Factors Influencing Immigrants' Commuting Modes

A large body of research, in Canada and in other car-dependent countries, especially the United States, has examined how social characteristics – intrinsic factors – influence immigrants' mode choices for commuting. Immigrant women have a higher propensity to use public transit than immigrant men (Preston et al., 2022). Economic factors are also important. Studies in the United States show that reliance on public transportation and active commuting tends to be higher for part-time workers than for full-time workers (McQuaid and Chen, 2012). As employment income rises, immigrants' transit use decreases (Delbosc and Shafi, 2023; Heisz and Schellenberg, 2004); similarly, the rate of active commuting is highest among low-income immigrants (Yu and Teschke, 2018). Marital status and the presence of dependent children under the age of fifteen also influence immigrants' mode choices. Single workers and workers without dependent children at home use public transportation and walk and bike more than their married counterparts or workers with dependent children (Hu, 2017; Newbold and Scott, 2018; Maciejewska et al., 2019; Maciejewska and Miralles-Guasch, 2020). Age affects access to cars, so it is not surprising that young adults and seniors are more likely to commute by alternative modes such as transit, cycling, and walking (Newbold and Scott, 2018). Finally, people who self-identify as non-Aboriginal and non-White (Statistics Canada, 2017a), have a greater propensity to use transit, even after the effects of other social characteristics such as income are considered (Newbold et al., 2017).

The impacts of extrinsic factors on immigrants' mode choices have also been investigated, especially at the neighborhood and intra-metropolitan scales. In American cities, high residential densities and the ready availability of transit in many neighborhoods where immigrants settle increase their use of transit and active commuting modes (Matsuo, 2016; Delbosc and Shafi, 2023). Attributes of immigrants' local social and built environments, such as housing type and ethnic group concentration, have also been studied, although evidence about their effects on mode use is mixed (Fan et al., 2014; Preston et al., 2022; Delbosc and Shafi, 2023). However, little is known about how immigrants' mode choices, and the factors influencing them, vary among metropolitan contexts. We investigate this question in the Canadian context where increasing numbers of recent immigrants are settling in smaller and mid-sized metropolitan areas where transportation options are limited.

### 2.3. Methods

We examine recent immigrants' commuting modes by comparing the commuting modes of recent immigrant, established immigrant, and Canadian-born workers in three metropolitan contexts: the gateway destinations of Montreal, Toronto and Vancouver and the small and medium metropolitan areas where immigrants are settling in increasing numbers. In addition to documenting mode choices in each context, the analysis also investigates the determinants of commuting mode in each metropolitan context for all workers and separately for recent immigrants.

Individual records from the 2016 census provide detailed commuting, social, and economic information for each immigrant who lives in a Canadian metropolitan area and was employed at the time of the census. Immigrants are people born outside Canada who have permanent residence or have been naturalized as Canadian citizens at the time of the census. The three dominant transportation modes are considered: private automobiles, public transit, and active commuting that consists of walking and cycling to work. Together these modes account for the commutes of 91.5% of all workers nationwide with only 1.1% of workers using other modes such as motorcycles and another 7.4% working from home in 2016. Information about multimodal trips is not available since workers are asked to identify their main commuting mode (Statistics Canada, 2017a).

To take account of transportation infrastructure and densities, we classify Canadian metropolitan areas (CMA) into three groups:

- The primary CMAs consist of Montreal, Toronto, and Vancouver where extensive subway, light rail and fixed rail systems link the city core and adjacent suburbs. As Canada's gateway cities with populations ranging from 2,500,000 to almost 6,000,000 in 2016, the three large metropolitan areas were also home to approximately 56% of Canada's recent immigrant population.
- With total populations that range from 230,000 to 1,400,000 in 2016, secondary CMAs are home to almost one third of recent immigrants, 31.5%. Found in most provinces, they typically have extensive bus systems but lack much rapid transit.
- Seventeen tertiary CMAs have total populations under 230,000 and only 3.7% of the recent immigrant population. Serving less than 100,000 commuters, the bus system in each tertiary metropolitan area is often sparse and service is scheduled mainly at peak hours.

With their unique transportation infrastructure (Wilkinson et al., 2016), rural areas and small towns where the remaining 8.8% of recent immigrants reside, are outside the scope of this study.

The analysis explores how recent immigrants' social characteristics and metropolitan contexts affect commuting mode in four stages. We first describe the metropolitan locations and social characteristics of recent and established immigrants. Next, we compare the modes reported by recent immigrant workers with those of established immigrants and Canadian-born workers in the three types of metropolitan area. In the third stage, multinomial logistic regression is used to evaluate the impacts of social and economic variables as well as immigrant status on the probability of using public transportation and active modes of commuting in each type of metropolitan area. Separate logistic regression equations are estimated for each type of metropolitan area to take account of their diverse social and built environments. In the fourth stage, we estimate separate logistic regression models of mode use for recent immigrants only by metropolitan area type, to examine how the determinants of commuting mode vary across metropolitan settings.

Social characteristics were selected for inclusion in the models based on relevance to immigrants' mode choices and data availability. The variables include gender, hours of work, employment income, age, marital status, the presence of dependent children under the age of fifteen and being non-White and non-Aboriginal. In some instances, variable categories had to be combined. For example, among recent

immigrants, the number of recent immigrants between 18 and 24 years of age who also work full-time is small, so age distinguishes working age adults (18–64 years of age) from seniors. Household composition was also simplified to distinguish households with dependent children at home from all others. People who are married, either legal or common-law status, are distinguished from people who are not married. Finally, minority status is dichotomized between those who identify as non-White and non-Aboriginal and the remaining population that is overwhelmingly White.

Multinomial logistic analysis allows us to evaluate how each social characteristic affects the probabilities of commuting on transit or actively by walking and cycling. For each nominal social characteristic, a reference category was identified for comparison with other variable categories. The reference categories reflect the emphasis in much of the literature on workers who are male, working age, and married with dependent children in the household (Crane and Takahashi, 2009; Hidayati et al., 2021). For individuals, the reference categories are men, working age adults, having a dependent child in the household and being married. Full-time hours, identifying as White, and being Canadian born are the remaining reference categories. Odds ratios describe for each variable the probability of using each alternative mode compared to the probability of travelling to work by car, controlling for all other variables in the model. An odds ratio greater than 1 indicates that the odds of using the alternative mode increases as the variable increases. An odds ratio less than 1 indicates that the odds of using alternative modes fall as the variable increases<sup>1</sup>. Due to the large sample size when the required weights are applied, all odds ratios are significant ( $p \leq 0.05$ ), so we report the 95% confidence intervals and emphasize the direction, magnitude, and interpretation of the odds ratios.

### 3. Results

#### 3.1. Spatial and Social Characteristics of Recent and Established Immigrants

Fig. 1 shows the uneven geographic distribution of immigrant populations among and within the three types of metropolitan areas in 2016<sup>2</sup>. In the three primary CMAs, immigrants comprise much larger shares of total population than in secondary or tertiary CMAs. In Toronto, almost half the CMA population is immigrant (47%), and the corresponding percentages for Vancouver and Montreal are 42% and 24% respectively. Although some secondary CMAs (e.g., Calgary, Winnipeg, Edmonton, Hamilton) have immigrant percentages that exceed that for Montreal, none are close to those for Toronto and Vancouver. Focusing on recent immigrants' share of the workforce, in primary and secondary metropolitan areas they account for 9.7% and 6.4% of workers respectively, but only 1.6% in tertiary metropolitan areas (Statistics Canada, 2017c). Although low, the numbers of recent immigrants in the tertiary metropolitan areas increased between 2006 and 2016 as jobs grew outside the primary metropolitan areas and government policies encouraged regionalization.

Examining recent immigrants as a percentage of a CMA's total immigrant population shows strong, albeit uneven, evidence of regionalization (Fig. 1). The percentage is highest in Regina, Saskatoon, Trois Rivières, Moncton, and Quebec City – all secondary and tertiary metropolitan areas – where recent immigrants make up over half the CMA's immigrant population. In contrast, in the three primary CMAs, the percentages range from 26% in Toronto to 36% in Montreal. Geographically, CMAs in which recent immigrants comprise a relatively

<sup>1</sup> When describing the findings, the percentage change in the likelihood of using a mode is calculated sometimes to facilitate comparison of the odds ratio across worker groups and metropolitan areas.

<sup>2</sup> The data are drawn from *Focus on Geography, 2016 Census* (Statistics Canada, 2017a).

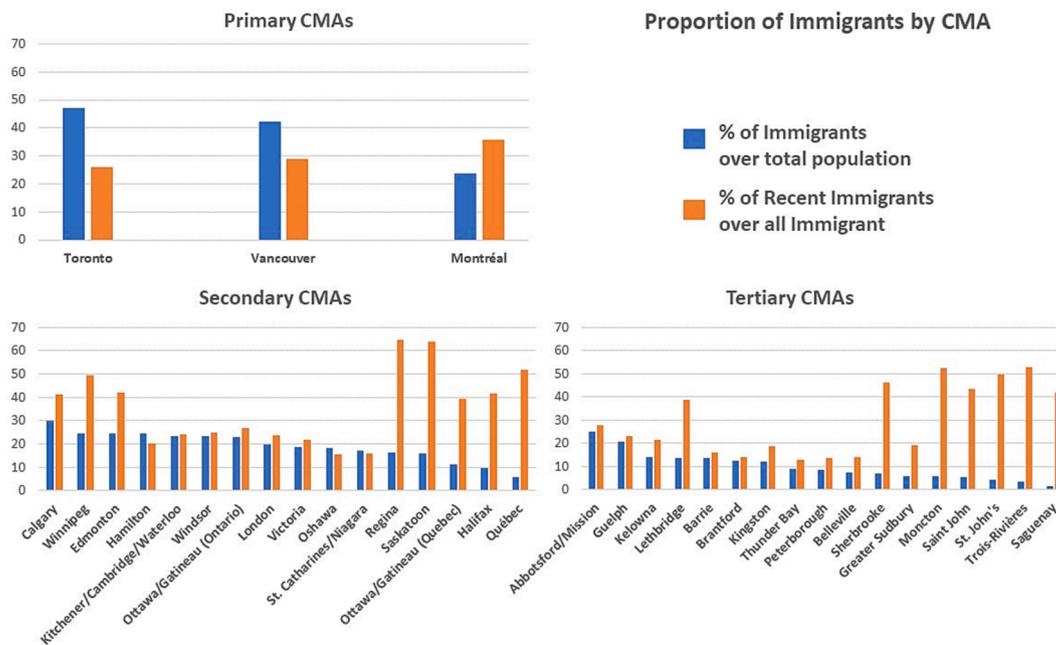


Fig. 1. Distribution of all immigrants and recent immigrants by CMA and CMA Type, 2016.

large share of the CMA immigrant population are mostly located in the Atlantic and Prairie provinces, and Quebec, where economic opportunities and provincial policies have attracted new immigrants.

A brief review of the social characteristics of each group of workers underscores how recent immigrant workers stand out (Table 1)<sup>3</sup>. More likely than other workers to live with dependent children, a higher percentage is married than either established immigrant or Canadian-born workers. Recent immigrants mostly identify as non-White and non-Aboriginal. They also report low average employment incomes, markedly lower than those reported by the other two groups of workers. The percentages of recent immigrants reporting part-time work are also higher in primary and secondary metropolitan areas. A larger percentage of established immigrants are also working age compared to recent immigrants and the Canadian-born.

Unlike the social characteristics of established immigrant and Canadian-born workers that are similar across all metropolitan area, several social characteristics of recent immigrant workers vary across the three sizes of CMAs (Table 1). The percentage of recent immigrants that are not married is highest in primary metropolitan areas and declines in secondary and tertiary metropolitan areas. Average employment income is also lower in primary CMAs than in either secondary or tertiary CMAs. The percentages of recent immigrants who identify as non-White and non-Aboriginal is also much higher in primary and secondary metropolitan areas than in tertiary metropolitan areas where only 68% of recent immigrant workers are non-White and non-Aboriginal.

### 3.2. Commuting Modes in Metropolitan Canada

Cars are still the dominant commuting mode in Canadian metropolitan areas (Fig. 2), especially in tertiary metropolitan areas, where more than 80% of each group of workers commute by private automobile. Census data (Statistics Canada, 2019) indicate the relative importance of alternative modes: transit, walking and cycling varies by CMA size. Transit reliance is highest in primary metropolitan areas, the three gateway cities where rapid transit and bus systems are well developed.

<sup>3</sup> Data about individual workers and their commutes are taken from *The Census of Canada, Individuals File* (Statistics Canada, 2019).

Transit and active modes (cycling and walking) are the second and third choices for work trips in primary and secondary metropolitan areas. In tertiary metropolitan areas, limited bus services and short distances may contribute to active commuting being more popular than transit.

Recent immigrants' reliance on transit and active commuting stands out in comparison to established immigrants' and Canadian-born workers' reliance on cars in all types of metropolitan area (Fig. 2). In primary metropolitan areas, 38.1 percent of recent immigrant workers commute by transit almost double the 19.7 percent of Canadian-born workers and a substantially higher percentage than the 22.1 percent for established immigrants. Similarly, in secondary and tertiary metropolitan areas, almost twice as large a share of recent immigrants as other workers use transit, even though transit riders are a small proportion of all commuters. In secondary metropolitan areas, 22.4% of recent immigrants use transit and this percentage falls to 6.0 percent in tertiary metropolitan areas. These percentages are much higher than the equivalent percentages for established immigrants and Canadian-born workers. Active commuting is much less common than driving or riding public transportation; however, in tertiary metropolitan areas it is an important mode for recent immigrants. More than one tenth of recent immigrants, 10.7%, walk or bike to work, a higher percentage than in either primary or secondary metropolitan areas and higher than the percentages for other workers.

### 3.3. Determinants of Commuting Mode by CMA Type

The differences in commute modes set the stage for analysis of the factors influencing transit use and active commuting. Odds ratios for multinomial regression models estimated separately for each mode are presented in Table 2. Looking first at transit users, the odds ratios underscore recent immigrants' reliance on transit. Compared to Canadian-born workers, recent immigrant workers are twice as likely to commute by transit in each type of metropolitan area. The odds ratios also confirm that the impact of being a newcomer on mode choice diminishes rapidly after the first decade of settlement. Established immigrants who have lived in Canada for at least a decade have only a slightly higher likelihood to use transit than Canadian-born workers in primary and secondary metropolitan areas, and they are less likely than the Canadian-born to use transit in tertiary metropolitan areas.

The odds ratios indicate that metropolitan context structures gender

**Table 1**  
Social Characteristics of Workers by CMA Type.

	Recent immigrant			Established immigrant			Canadian-born		
	Primary	Secondary	Tertiary	Primary	Secondary	Tertiary	Primary	Secondary	Tertiary
Gender									
Men*	54.4%	54.9%	53.6%	52.3%	52.7%	53.5%	51.9%	52.1%	52.6%
Women	45.6%	45.1%	46.4%	47.7%	47.3%	46.5%	48.1%	47.9%	47.4%
Age									
Working age (18–65)*	90.4%	90.1%	91.5%	96.2%	95.6%	96.5%	85.3%	86.6%	88.5%
Senior (65 and over)	9.6%	9.9%	8.5%	3.8%	4.4%	3.5%	14.7%	13.4%	11.5%
Parental status									
Dependent children*	41.2%	43.7%	44.2%	24.3%	29.9%	30.4%	23.6%	25.2%	25.4%
No dependent children	58.2%	56.3%	55.8%	75.7%	70.1%	69.6%	76.3%	74.8%	73.6%
Marital status									
Married*	71.4%	76.5%	82.2%	70.9%	73.6%	80.1%	54.9%	60.8%	66.5%
Not married	28.6%	23.5%	17.9%	29.1%	26.4%	19.9%	45.1%	39.2%	33.5%
Work hours									
Full-time hours*	79.9%	79.8%	81.9%	84.0%	83.1%	79.9%	80.2%	81.7%	81.5%
Part-time hours	20.1%	20.2%	18.1%	16.0%	16.9%	20.1%	19.8%	18.3%	18.5%
Employment income (\$ mean)**	\$37,935	\$42,725	\$43,510	\$54,175	\$59,400	\$52,670	\$60,985	\$60,505	\$48,870
Minority status									
White*	20.0%	16.7%	32.0%	28.4%	41.0%	76.5%	87.3%	96.0%	99.4%
Non-white/Non-Aboriginal	80.0%	83.3%	68.0%	71.6%	59.0%	23.5%	12.7%	4.0%	0.6%

\*Reference category.

\*\*Rounded to 0 or 5.

Source: [Statistics Canada \(2019\)](#).

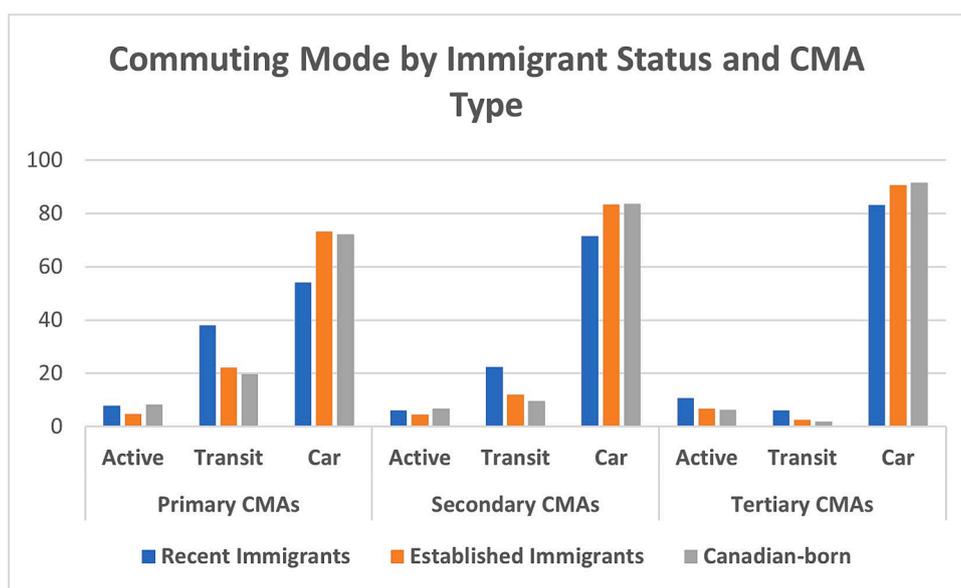


Fig. 2. Commuting Mode by Immigrant Status and CMA Type, 2016.

differences in transit use (Table 2). In primary and secondary metropolitan areas, working women are between 67.0% and 42.4% more likely to commute by transit than male workers, even after immigration status and the other social characteristics including employment income, work hours, marital status and the presence of dependent children are controlled. This is not the case in tertiary metropolitan areas where working women are slightly less likely than men to commute on transit. It appears that near-universal reliance on the car for commuting in tertiary metropolitan areas contributes to a reversal of differences in transit use between men and women and between established immigrants and the Canadian-born.

In all types of metropolitan areas, non-White and non-Aboriginal workers are more likely than Whites, the reference group, to use transit (Table 2). In primary metropolitan areas, the odds of commuting by transit are approximately 50% higher for workers who identify as non-White and non-Aboriginal than for White workers. The gap is even

wider in secondary and tertiary metropolitan areas, where non-White and non-Aboriginal workers' odds of commuting by transit are 76.6 percent and 127.5 percent higher respectively than those of White workers. The smaller gap in the primary CMA may result from higher transit use among White workers and the heterogeneity of the workers who identify as non-White and non-Aboriginal in the historic gateway cities. Toronto is typical in this respect. The three largest non-White and non-Aboriginal groups in the metropolitan area are South Asian, itself a broad category that includes diverse people from all parts of India, Sri Lanka, Pakistan, Bangladesh, Afghanistan, and their global diasporas, Chinese, and Black (Statistics Canada, 2017b). Gentrification in the three primary metropolitan areas has also attracted many White workers to central areas where frequent and accessible transit affords convenient access to jobs (Preston and Ray, 2020).

Age also affects transit use. Specifically, senior workers are more likely than those of working age to use transit in every type of

**Table 2**  
Multinomial Logistic Regression for Commuting Mode by CMA Type.

Predictor	Odds Ratios (95% Confidence Interval)*					
	Transit			Active		
	Primary CMA	Secondary CMA	Tertiary CMA	Primary CMA	Secondary CMA	Tertiary CMA
Female	1.670 (1.663, 1.678)	1.424 (1.414, 1.434)	0.979 (0.965, 0.992)	1.180 (1.171, 1.188)	1.025 (1.017, 1.034)	1.152 (1.143, 1.161)
Seniors (65 + )	1.425 (1.414, 1.436)	1.325 (1.311, 1.339)	1.480 (1.453, 1.508)	0.938 (0.927, 0.949)	1.071 (1.580, 1.085)	0.950 (0.939, 0.962)
No dependent children	1.380 (1.372, 1.388)	1.306 (1.294, 1.317)	1.370 (1.344, 1.396)	1.775 (1.757, 1.793)	1.391 (1.375, 1.407)	1.310 (1.297, 1.323)
Not married	1.665 (1.663, 1.678)	1.749 (1.735, 1.763)	1.812 (1.784, 1.840)	1.710 (1.696, 1.724)	1.732 (1.716, 1.749)	1.581 (1.567, 1.595)
Part-time hours	1.141 (1.134, 1.149)	1.146 (1.135, 1.157)	1.685 (1.656, 1.714)	1.409 (1.396, 1.423)	1.391 (1.375, 1.407)	1.318 (1.318, 1.344)
Log income	1.021 (1.016, 1.026)	0.889 (0.884, 0.895)	0.999 (0.986, 1.013)	0.832 (0.827, 0.837)	0.807 (0.801, 0.813)	0.719 (0.715, 0.723)
Recent immigrant	2.440 (2.420, 2.460)	2.042 (2.012, 2.072)	2.089 (1.987, 2.197)	1.984 (1.957, 1.201)	1.458 (1.425, 1.491)	2.000 (1.931, 2.072)
Established immigrant	1.027 (1.021, 1.033)	1.105 (1.091, 1.118)	0.825 (0.791, 0.861)	0.793 (0.705, 0.802)	0.787 (0.773, 0.801)	1.039 (1.016, 1.064)
Non-white/Non-Aboriginal	1.524 (1.516, 1.533)	1.787 (1.767, 1.807)	2.275 (2.185, 2.368)	0.667 (0.661, 0.674)	0.764 (0.751, 0.777)	1.050 (1.019, 1.082)
Intercept	-2.328	-2.408	-4.541	-2.173	-2.120	-1.751
Weighted N	1,084,998	401,479	88,146	345,175	243,010	276,307

Calculations by authors.

\*Due to the large sample sizes created when the required weights are applied, all intercept values and odds ratios are significant ( $p < 0.01$ ).

Source: [Statistics Canada \(2019\)](#).

metropolitan area. The odds ratios are similar, ranging from 1.480 in tertiary metropolitan areas to 1.325 and 1.425 in secondary and primary CMAs, even though the transit infrastructure varies tremendously. The odds ratios underscore how aging encourages transit use.

Employment income also affects the odds of using transit and its effects vary across the three types of metropolitan area. In primary metropolitan areas, the likelihood of using transit increases slightly as income increases (Table 2). The reverse is true in secondary metropolitan areas where the likelihood of using transit decreases for each increase in income, possibly a reflection of the overwhelming reliance on cars for work trips (Fig. 2). The magnitudes of the effects of part-time work also differ across the metropolitan areas. As expected, part-time work increases the likelihood of transit use in all types of metropolitan area, but the impact is greatest in tertiary metropolitan areas. In primary and secondary metropolitan areas, part-time workers are only slightly more likely than their full-time counterparts to use transit. In tertiary metropolitan areas, the odds of commuting by transit are 68.5% higher for part-time workers than for similar full-time workers.

The odds ratios highlight how household responsibilities affect commuting mode. Being unmarried and not having dependent children in the household encourage transit use in every type of metropolitan area and the effects are consistent. In tertiary metropolitan areas, unmarried workers and workers without dependent children at home have odds of commuting by transit that are 81.2% and 37.0% greater than those of married workers and those with dependent children at home (Table 2). The equivalent disparities in the odds of using transit are 66.5% and 38.0% in primary metropolitan areas and 74.9% and 30.6% in secondary metropolitan areas. The significant impacts of marital status and the presence of dependent children on transit use are important for two reasons. They confirm that household responsibilities affect mode choices on work trips and both social characteristics have consistent effects independent of gender.

Turning now to active commuting, Table 2 indicates that many odds ratios for active commuting mirror those for transit use. Specifically, immigration status, being non-White and non-Aboriginal, work hours, and household responsibilities have similar effects on the chances of commuting actively as they had on the likelihood of using transit. For example, the odds ratios confirm that immigration status is a major determinant of active commuting just as it was for transit. Recent

immigrants are much more likely than the Canadian-born to walk or bike to work with odds of 1.984 and 2.000 in primary and tertiary metropolitan areas and 1.458 in secondary CMAs (Table 2). Established immigrants, however, are less likely than the Canadian-born to walk or bike to work in primary and secondary metropolitan areas, but slightly more likely to commute actively in tertiary metropolitan areas. A similar spatial ordering is also apparent in the odds ratios for minority status. In primary and secondary metropolitan areas, non-White and non-Aboriginal workers are less likely to walk or bike than White workers, with odds ratios of 0.660 and 0.755 respectively; however, in tertiary metropolitan areas, they are slightly more likely to commute actively.

The effects of hours of work and employment income on the chances of commuting actively are consistent across the CMAs. Part-time work increases the chances of active commuting even after all other social characteristics are controlled (Table 2). The odds of walking and cycling to work increase from 32.8% to 43.5% from the tertiary to primary metropolitan areas for part-time workers confirming that work hours have a major impact on active commuting and suggesting that part-time workers look for jobs near home, as shown in other recent studies (Clark et al., 2016). The odds ratios for employment income which range from 0.720 in tertiary metropolitan areas to 0.826 in primary metropolitan areas suggest that the chances of active commuting decrease with increasing income.

As with transit, workers who have fewer household responsibilities because they do not have dependent children or are not married are more likely to commute actively in every type of metropolitan area. Compared with married workers, other workers are 69.6%, 71.8% and 58.2% more likely to commute actively in primary, secondary, and tertiary metropolitan areas. The impacts of not having dependent children at home are also substantial (Table 2). These findings hint at the challenges of commuting actively for workers who juggle household responsibilities with the demands of paid work.

The odds ratios also suggest that gender and age have different impacts on active commuting than on transit use. For example, gender affects the chances of active commuting less than it affects transit use. In every size of CMA, women are more likely than men to walk or bike to work, but the odds ratios are smaller for active commuting than for transit use. Women’s chances of active commuting are only slightly higher than those of similar men in all types of metropolitan areas, as

indicated by odds ratios very close to one. The effects of age are also more muted for active commuting than for transit use. Compared with working age commuters, seniors tend to be less likely to commute actively. For seniors, the odds ratios for walking and cycling are slightly less than 1.0 in primary and tertiary metropolitan areas and only just above 1.0 in secondary metropolitan areas.

### 3.4. The Determinants of Commuting Mode for Recent Immigrants

Separate logistic regression analyses for recent immigrant workers highlight how social characteristics and metropolitan context shape recent immigrants' commuting modes (Table 3). As we found for all workers, gender and household responsibilities are key determinants of transit use and active commuting for recent immigrant workers in all types of metropolitan area. Among recent immigrants, women workers are much more likely to use transit and to walk and bike to work than workers who are men, with odds ratios ranging from 1.557 to 2.240 across the three types of metropolitan area. The observed gender differences far exceed those observed for the working population overall (Table 2), emphasizing recent immigrant women's dependence on alternative modes, even in medium and small metropolitan areas where densities are low and transit service is limited. The results also reveal the importance of household responsibilities. Having no dependent children at home and not being married positively impact use of transit and active modes in all settings.

Regarding racial minority status, the results show that metropolitan context strongly shapes its impact on use of alternative, non-car modes. Identifying as non-White and non-Aboriginal increases transit use in all contexts; however, the impact is much larger in tertiary metropolitan areas where the odds ratio is 2.801 (Table 3). In the smallest metropolitan areas, recent immigrant workers who are non-White and non-Aboriginal are almost three times as likely as White workers to rely on transit for commuting. For active commuting, the odds ratios for being non-White and non-Aboriginal also vary across metropolitan contexts. Minority status reduces active commuting in primary and secondary metropolitan areas, possibly because recent immigrants who identify as non-White and non-Aboriginal live mainly in inner suburbs far from their workplaces (Preston and Ray, 2020; Harun et al., 2021). In contrast, in tertiary metropolitan areas where recent immigrants may live closer to their workplaces and transit services are least developed, workers who are non-White and non-Aboriginal have a 35.7% higher chance of active commuting than White workers who are also recent

immigrants.

The effects of age are equally variegated between the two alternative commuting modes and across metropolitan contexts. In primary metropolitan areas, workers who are seniors are 22.3% more likely than the working age to use transit (Table 3). In secondary and tertiary metropolitan areas, seniors are less likely than the working age to use transit. The decline in the odds ratio is notable, with seniors in tertiary metropolitan areas 42.2% less likely to commute on transit than other recent immigrant workers. Older age is associated with equally large declines in the likelihood of walking and cycling to work. The odds ratios for active commuting range from a high of 0.966 in primary metropolitan areas to 0.528 in tertiary metropolitan areas. The decline in the odds ratios for active commuting underscores how metropolitan context shapes the impacts of age on recent immigrants' commute modes.

Turning to the two economic characteristics; employment income and hours of work, we also find varying effects on the likelihood of using each mode between the two modes and across the metropolitan areas. In primary and secondary metropolitan areas, recent immigrants' chances of using transit decrease as income increases, as indicated by odds ratios less than one (Table 3). In tertiary metropolitan areas, an increase in recent immigrants' employment income is associated with increased transit use. The likelihood of active commuting declines with employment income in all metropolitan areas (Table 3). Overall, the impacts of employment income contradict explanations for recent immigrants' reliance on transit and active modes that emphasize cultural preferences. The odds ratios show that rising employment incomes will usually encourage commuting by car, overcoming any cultural preferences, with the notable exception of transit use in tertiary metropolitan areas.

Part-time work increases use of alternative modes in primary and secondary metropolitan areas (Table 3). In primary and secondary metropolitan areas, the magnitudes of these effects, estimated independently of the other social characteristics, confirm earlier findings that part-time workers seek jobs near home or to which they can travel on transit (Hanson and Pratt, 1995). The impacts of hours of work are more complicated in tertiary metropolitan areas. Compared with full-time workers, recent immigrants who are part-time workers are 63.2% more likely to commute by transit, but less likely to walk or bike to work. Once again, the determinants of mode choices in the tertiary metropolitan areas where recent immigrants are being encouraged to settle are different from those in primary and secondary metropolitan areas.

The analysis of recent immigrants' commute modes has confirmed

**Table 3**  
Multinomial Logistic Regression for Mode Choices of Recent Immigrants by CMA Type.

Predictor	Odds Ratios (95% Confidence Interval)*					
	Transit			Active		
	Primary CMA	Secondary CMA	Tertiary CMA	Primary CMA	Secondary CMA	Tertiary CMA
Female	2.240 (2.211, 2.269)	2.113 (2.068, 2.160)	1.671 (1.543, 1.809)	1.828 (1.786, 1.871)	1.557 (1.501, 1.615)	1.790 (1.685, 1.901)
Seniors (65 + )	1.223 (1.191, 1.255)	0.943 (0.907, 0.981)	0.578 (0.490, 0.692)	0.966 (0.925, 1.009)	0.618 (0.578, 0.662)	0.528 (0.471, 0.591)
No dependent children	1.626 (1.603, 1.650)	1.434 (1.400, 1.469)	1.934 (1.778, 2.103)	2.282 (2.220, 2.345)	1.470 (1.409, 1.533)	2.299 (2.149, 2.461)
Not married	1.508 (1.484, 1.533)	1.805 (1.752, 1.859)	1.229 (1.092, 1.382)	1.462 (1.423, 1.503)	2.295 (2.188, 2.407)	1.951 (1.798, 2.118)
Part-time hours	1.241 (1.219, 1.264)	1.525 (1.484, 1.567)	1.632 (1.468, 1.814)	1.549 (1.503, 1.596)	1.389 (1.325, 1.456)	0.867 (0.796, 0.945)
Log income	0.937 (0.925, 0.949)	0.843 (0.827, 0.859)	1.382 (1.243, 1.537)	0.870 (0.852, 0.888)	0.788 (0.766, 0.811)	0.769 (0.730, 0.811)
Non-white/Non-Aboriginal	1.062 (1.044, 1.080)	1.882 (1.820, 1.947)	2.801 (2.525, 3.108)	0.408 (0.398, 0.419)	0.672 (0.644, 0.722)	1.357 (1.270, 1.450)
Intercept	-0.975	-1.805	-5.697	-1.660	-1.794	-2.060
Weighted N	171,270	49,242	2,999	35,373	13,219	5,407

Calculations by authors.

\*Due to the large sample sizes created when the required weights are applied, all intercept values and odds ratios are significant (p less than 0.01).

Source: Statistics Canada (2019).

that all the social characteristics influence the chances that recent immigrants commute by transit or by walking and cycling. The determinants of transit use and active commuting also differ from each other and they vary across metropolitan contexts. The metropolitan variations in the magnitudes and directions of the effects of each social characteristic on commute mode raise many issues about policies to promote the dispersion of immigrants from the gateway cities to medium-sized and small metropolitan areas across Canada.

#### 4. Discussion

Shifts in immigrant settlement geographies in Canada and other high-income and car-dependent countries have raised important concerns about the mobility challenges immigrants face in geographical settings in which transportation options, aside from the private car, are scarce. Our findings shed light on the nature and extent of these challenges for recent immigrants in diverse metropolitan settings. Confirming research in Canada (Harun et al., 2021; Preston et al., 2022), we find that recent immigrants are more likely than other workers to walk and bike as well as use transit. However, our analysis adds to that literature by showing that these differences in commuting extend to the small and mid-sized metropolitan areas where immigrants new to Canada increasingly settle in car-centric urban environments that do not necessarily facilitate commuting by transit, bike, or walking.

Recent immigrants' dependence on transit stands out. In every metropolitan context, they are more than twice as likely to use transit than established immigrant and Canadian-born workers, even after many social characteristics are controlled. The high likelihood that recent immigrants use transit cannot be fully explained by their tendency to live in transit-rich large metropolitan areas or by their social characteristics. Rather, recent immigrants may lack the wealth needed to purchase, operate, maintain, and sustain a car for their commuting journeys (Chatman and Klein, 2013; Klein and Smart, 2017). Our findings underscore earlier evidence that the availability of an efficient public transport system is key to ensure access to work for recent immigrants (Heisz and Schellenberg, 2004; Lo et al., 2011; Newbold et al., 2017).

Among recent immigrants, our findings also highlight women's particular reliance on non-car modes in all metropolitan contexts. Recent immigrant women's reliance on transit and active modes is 1.5 to 2 times greater than that of their male counterparts, even when other social characteristics, including non-White and non-Aboriginal status, household type and presence of children, are controlled. These findings are consistent with those reported in the wider literature on immigrants' commuting modes (Newbold et al., 2017; Preston et al., 2022); however, our analyses add to that work by demonstrating that for recent immigrants, gender disparities persist regardless of metropolitan setting. Beyond the gateway cities, recent immigrant women's dependence on non-car modes points to the significance of transit availability and proximity to work in facilitating their labor market participation and access to jobs.

More broadly, the analysis adds to our understanding of immigrants' commuting modes by demonstrating that the determinants of transit use and active commuting differ across primary, secondary, and tertiary metropolitan areas, revealing the interaction between intrinsic and extrinsic factors in mode use. The spatial variation in the effects of individual social characteristics on commute mode persist even when the mode choices of recent immigrants are analyzed separately. Metropolitan context shapes the determinants of commute mode, especially recent immigrants' use of alternative commuting modes.

#### 5. Conclusions

From a mobility inequality perspective (Wellman, 2018; Hidayati et al., 2021), the findings reported here raise several concerns about the recent dispersion of immigrant settlement in Canada and other countries

(OECD, 2022). With their reliance on transit and active commuting, recent immigrants who settle in small and medium metropolitan areas may be at a disadvantage as they seek employment and attempt to access the services that facilitate settlement and integration. Our findings indicate that additional transportation infrastructure is needed to accommodate the newcomers' mobility needs and reduce mobility inequality (Van Egmond et al., 2021).

Improving the level and quality of transit services in small and medium metropolitan areas will benefit all residents and may encourage use of public transit rather than private automobiles. Although mass transit systems may not be economically feasible in all small metropolitan contexts, other options include van systems that meet off-peak demand and enable extensive geographical coverage; employer-subsidized transportation; and municipal collaboration with employers to facilitate carpooling. The empirical findings also indicate that active commuting in the form of walking and cycling does not fill the gap created by limited public transportation in these metropolitan areas. Additional research is needed to investigate the extrinsic factors influencing active commuting. Do metropolitan areas have sufficient bike lanes, sidewalks, and other infrastructure to ensure that active commuting is safe? Are cycling and walking feasible in metropolitan areas marked by low-density, car-centric urban environments in which residential and other land uses may be sharply segregated?

As we see in the 2016 data for tertiary metropolitan areas, the alternative is reliance on private automobiles for commuting even during the first decade that immigrants live in Canada. Apart from the financial and logistical challenges that automobile ownership can pose for recent immigrants (Chatman and Klein, 2013; Klein and Smart, 2017), encouraging use of private automobiles for work trips is contrary to the climate goals of many provincial, territorial, municipal, and federal governments. Reliance on the automobile also raises questions of gender equity for recent immigrant women who are often less likely than men to possess driver's licenses (Blumenberg, 2009), and, within households, may have less access to cars (Matsuo, 2016). Without frequent, extensive, and affordable transit services that accommodate trip chaining (Amar and Teelucksingh, 2015; Grant-Smith et al., 2017), recent immigrants, especially women, will struggle to access jobs and many essential services in small metropolitan areas (Allen and Farber, 2020).

The quantitative analysis reported here makes an important contribution by outlining some contours of mobility inequality for immigrants in Canada's metropolitan areas. By demonstrating that the determinants of immigrants' commuting modes differ among large, medium, and small metropolitan areas, the study underscores the need for additional research examining immigrant men's and women's experiences of mobility inequality and its consequences in different metropolitan areas. In-depth qualitative research that expands on current case studies (Amar and Teelucksingh, 2015; Premji, 2017; Farber et al. 2018) would address questions about the ways that limited transit service, safety concerns, and severe weather restrict immigrants' mobility. The impacts of mobility constraints on multiple dimensions of wellbeing (Shirgaokar and Nobles, 2021), not just the economic aspects that are central in a commuting study, also warrant investigation. Given the significance of mobility for all aspects of everyday life, strategies encouraging immigrant representation in transportation and other urban planning also warrant investigation through qualitative research.

Although it is necessarily partial, our analysis of immigrants' commuting modes in different metropolitan areas responds to recent calls for research that documents mobility inequalities in contemporary car-centric environments (Wellman, 2018). By paying attention to workers' diverse social characteristics and the diversity of places where they live and work, the analysis has underscored the significance of transportation infrastructure and transportation planning that enable non-car commuting modes for all workers. Enhancing infrastructure for riding transit, walking, and cycling, especially in small and medium metropolitan areas, will improve mobility and access to employment for

all urban residents.

### CRediT authorship contribution statement

**Valerie Preston:** Conceptualization, Methodology, Formal analysis, Writing – original draft, Writing – review & editing, Funding acquisition. **Sara McLafferty:** Methodology, Validation, Writing – original draft, Writing – review & editing. **Monika Maciejewska:** Data curation, Visualization, Writing – review & editing.

### Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

### Data availability

The authors do not have permission to share data.

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