

## TRANSPORT FINDINGS

# Analyzing Public Transport Mode Share by Generational Cohort in Montreal Canada (1998-2018)

Stephen Hickson<sup>1</sup> , Ahmed El-geneidy<sup>1</sup> <sup>1</sup> School of Urban Planning, McGill University

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## Findings

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This paper observes generational public transport mode share in Montreal, Canada by age group using five Origin-Destination Surveys from 1998 to 2018. Using total number of trips to work and school by public transport, the findings indicate that younger generations have higher public transport use in early adulthood which corresponds to higher use later in life compared to previous generations. Across generations, public transport mode share decreases significantly for individuals in their late twenties and thirties before stabilizing and, in some cases, increasing after the age of forty. For exclusively school bound trips, the findings suggest that expanding students' discount for those 25 and older was the most impactful for students in their thirties and that return diminishes with older ages.

## 1. Questions

Over the last decade there have been significant debates among transport researchers over whether the travel behaviour of younger generations such as Millennials and Generation Z are fundamentally different than those of older generations (Delbosc and Ralph 2017). One side of the debate asserts that younger generations have different lifestyle preferences with desires to live in dense, mixed-use urban centres which reduces their dependency on automobiles. Opponents argue that Millennials are simply delaying life milestones such as obtaining a driver's license and buying a car in response to economic factors (Klein and Smart 2017).

In a previous mode share analysis using three Montreal Origin-Destination (OD) Surveys, Grimsrud and El-Geneidy (2014) found that younger generations used public transport at a higher rate in early adulthood, which corresponded to higher use later in life compared to previous generations. Our study asks whether these findings remain valid ten years later by expanding the time frame of observation to 20 years, which was only limited to 10 years in their paper, through adding data from the 2013 and 2018 Montreal OD surveys. Our study also expands the age range to include those who were born between 1939 and 1998. The main research questions we are trying to answer are: Are today's youth using public transport at a higher rate compared to previous generations? Does higher public transport use amongst younger generations in early adulthood correspond with relatively higher use later in life? And are these results different exclusively for school trips?

## 2. Methods

The Montreal OD survey is a cross-sectional household travel survey conducted every five years covering 5% of the population residing in the Montreal metropolitan area. The OD is administered by the Autorité Régionale de Transport Métropolitain (ARTM) (“Enquête Origine-Destination 2018,” n.d.), and documents detailed information regarding each trip made by all individuals in each surveyed household, including mode choice, trip purpose, and time of departure. The survey includes documentations of individuals personal and household characteristics. The 1998, 2003, 2008, 2013, and 2018 OD survey data was clipped using Geographic Information System (GIS) to only include origins and destinations within the Montreal Metropolitan Area (CMA). Data was then filtered to only include those aged 20 to 59, as well as only trips made for work and school purposes that originated from home. The final count for the number of trips in the analysis was 53,739 trips in 1998, 45,822 trips in 2003, 45,049 trips in 2008, 50,668 trips in 2013, and 43,180 in 2018. The mode choices were filtered into 5 categories: public transport, walk/bike, park and ride, car driver or passenger, and other (school bus, taxi, interurban mode, and undetermined). Birth cohorts were created using five-year intervals dating back to 1939 and then arranged for cross-sectional analysis.

## 3. Findings

[Figure 1](#) shows the public transport mode share by OD survey year. The 2018 OD survey had the highest public transport mode share in the 20-24, 30-34, 35-39, and 40-44 age groups. The 2008 survey had the highest mode share for the 25-29, 50-54, and 55-59 age groups and the 2013 survey had the highest mode share for the 45-49 age group. Public transport mode share across all ages increased by an average of over 8 percentage points from 1998 to 2018. Across all cohorts, public transport mode share drops the fastest between the early twenties and the late twenties groups with an average decrease of over 18%. This rate of decrease slows as people age before eventually plateauing and even slightly in some cases increasing once cohorts reach their forties. It is worth noting that in recent surveys, public transport use as a proportion of all work and school trips has generally increased.

[Figure 2](#) shows the evolution of each cohort’s public transport mode share by age showing the quick decrease in early adulthood followed by a plateau after the age of 40. Public transport mode share for those in the 20-24 age group in 2018 was 46% in 2018 which was 2.5 percentage points higher than the previous high in 2013 and nearly 10 percentage points higher than the same age group in 1998. This is encouraging for public transport as the trend in previous cohorts indicates that younger generations have higher public transport use in early adulthood which, though it declines, remains higher later in life compared to previous generations.

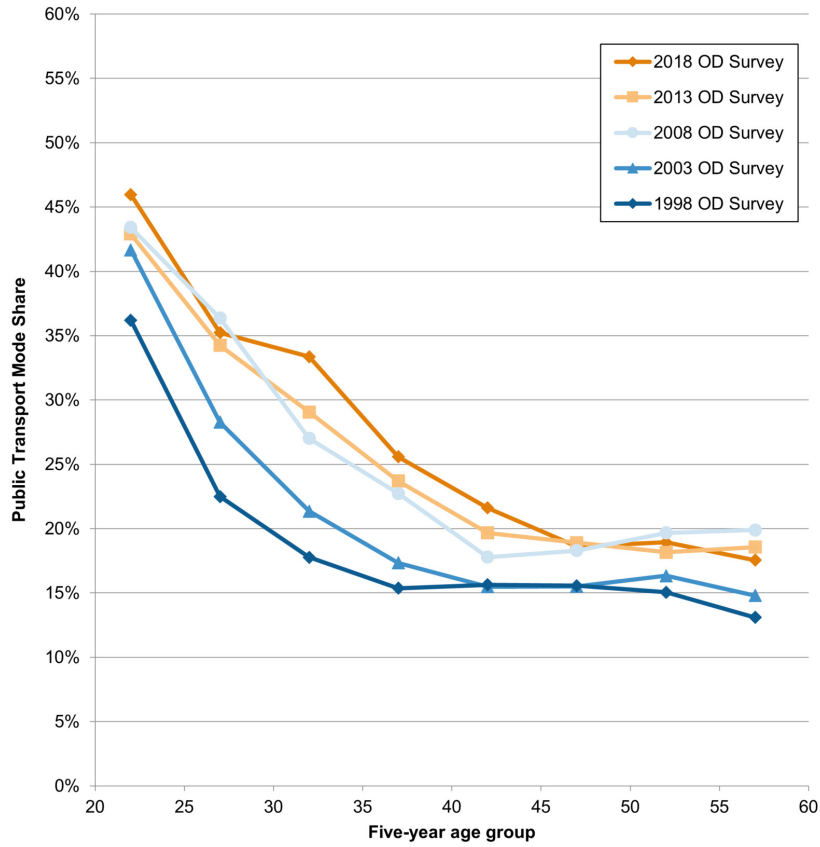


Figure 1. Public transport mode share by age group by survey year

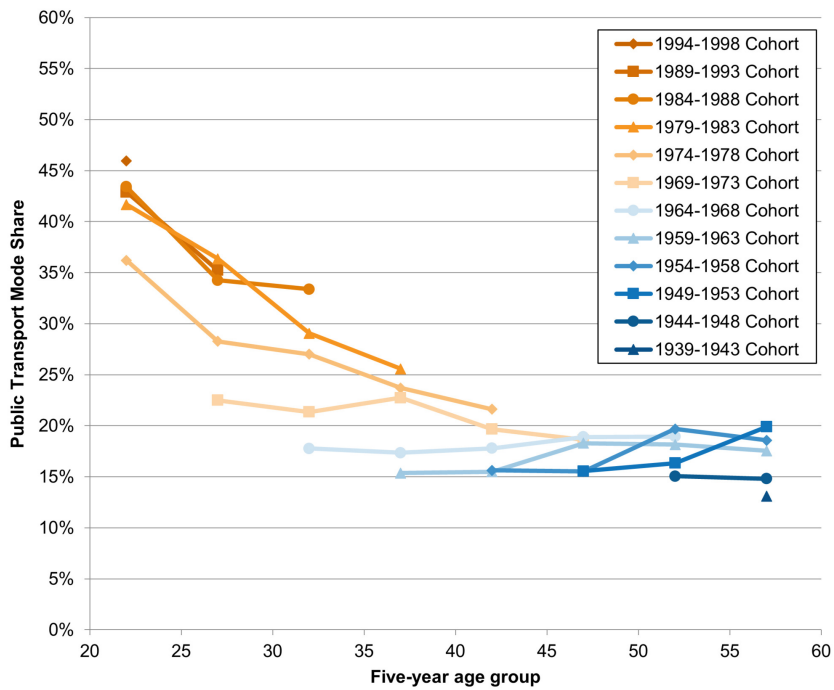


Figure 2. Public transport mode share by age group across generational cohorts

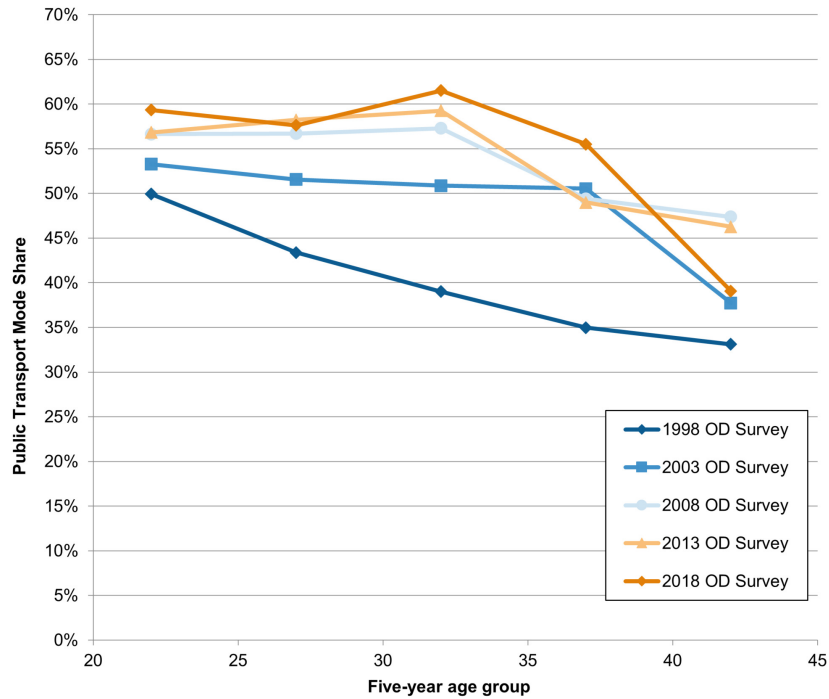


Figure 3. Public transport mode share for school bound only trips by age group by survey year

For example, the 1984-1988 cohort had a 43% public transport mode share when they were between 20-24 of age and a 33% public transport mode share when they were 30-34 of age. Such observations are higher than previous cohorts for the same age groups. The 1979-1983 cohort had a higher public transport mode share than all previous cohorts at both ages 20-24 and 35-39. With minor exceptions, this trend of younger generations having higher public transport use in early adulthood and higher public transport use later in life largely holds.

In 2017 a decision was made by the local public transport authority in Montreal to expand the student discounted fare to include students older than 25 years. The previous discount limited student discount access to those 25 years old and younger (CBC News 2017). For students living on the Island of Montreal, monthly passes are lower by 40% compared regular passes. For those living in the off-island areas monthly passes are lower by 20% compared to regular passes. As seen in [Figure 3](#) the impacts of this program on school bound public transport mode share are mixed. From 2013 to 2018, the school bound public transport mode share for the 25 to 29 age group slightly diminished (-1%), while moderate growth is observed for the 30-34 age group (3.8%), and a substantial growth is observed among the 35 and 39 (13.3%) age group. In all older age groups, public transport mode share for school bound trips decreased after the changes were implemented. While there are certainly many variables behind this decrease, it is unlikely that cheaper fares are responsible.

## Conclusions

The findings from Grimsrud and El-Geneidy (2014) are still valid after expanding the observation period to 20 years. Younger generations have higher public transport use in early adulthood which, though it decreases with age, remains higher later in life compared to previous generations. Public transport agencies looking to increase ridership in the long run should strongly consider investing in young riders through increased service to desired destinations or through reduced youth and student fares.

For students, the results seem to indicate that the expanded student pass program is most impactful toward influencing mode choice for students in their late thirties. The expanded pass appears to be less impactful for students in their late twenties, who were already using public transport at a relatively high rate, and for students above forty who have potentially moved to less public transport friendly areas, or have other obligations that discourage regular public transport use.

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