Appendix F

Appendix F

Transportation Equity

BURNSIDE

Innisfil

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Project Name: Innisfil Transportation Master Plan Update

To: Town of Innisfil

From: R.J. Burnside & Associates Limited

1.0 Introduction

1.1 Overview

Equity is a quality of being fair and impartial. An equitable transportation system ensures that the distribution of infrastructure and programs allows for different populations to have reasonably equal transportation benefits and impacts. Recent transportation planning principles have taken equity into consideration. For example, *Vision Zero* seeks to ensure that vulnerable road users such as pedestrians and cyclists are provided infrastructure to ensure robust safety and protection. *Complete Streets* seeks to ensure that a transportation system is built for all road users regardless of age or ability.

An equitable transportation system requires that the planning process takes into consideration the needs of the community. This involves ensuring that project outreach and public engagement is representative of all different demographics including race, age, and gender. Working people may have trouble finding the time or resources to attend public meetings especially if they require childcare or require special mobility needs. This can lead to planned projects and improvements to be disconnected from the needs of the community.

To ensure infrastructure planning decisions are equitable, an equity analysis is undertaken taking into consideration several indicators. Examples of transportation equity indicators can include access, affordability, reliability, and safety. Transportation equity analysis is challenging because there are several types of equity, many ways[1] to measure equity, and many different viewpoints of what is considered fair. Additionally, equity has not been an explicit part of the planning process, historically, and usually considered during or after implementation. There is also not an established framework or set of best practices for equity evaluation tools.

However, transportation equity analysis is important as transportation planning decisions can have significant impacts to the community. The impacts of these decisions include:

- Household expenditures: Transportation and living costs usually make a significant portion of household spending.

[1] Todd Litman, 'Evaluating Transportation Equity', Victoria Transport Policy Institute, Victoria, British Columbia, https://www.vtpi.org/ (Accessed: October 22, 2021)

- Access to jobs: Employment opportunities are limited to people having reasonable and consistent access to mobility choices.
- Transportation infrastructure imposes indirect and external costs such as pollution, vehicular accidents, and congestion delay. These costs usually affect certain populations such as low-income neighbourhoods disproportionally.

1.2 Types of Equity

Horizontal equity treats people in identical situations, primarily those with equal access to wealth and resources, the same way[2]. In this system, the benefit-to-cost ratio is the same regardless of access to wealth and resources. The user receives exactly what is paid. Because people in identical situations are treated the same, horizontal equity attempts to eliminate discrimination on race, gender, and other socio-economic factors.

Vertical equity aims to redistribute resources from those who have greater access to wealth and resources to those with less. In this system, those with greater access bare more of the costs relative to the same benefits. Vertical equity in transportation aims to create a universal system that accommodates people with diverse needs and abilities, planning for affordability, and provide special benefits to disadvantaged groups. For example, the Innisfil Uber transit's Fair Transit Program provides 50% all rides for low-income households.

1.3 Transportation Affordability

In the Greater Toronto Hamilton Area (GTHA), low-income households are more likely to be in areas with better transit accessibility but participate in substantially fewer daily activities than wealthier households[3]. Low-income households with no vehicle ownership had the lowest activity rates. These households were shown to have a significant positive relationship between transit accessibility and activity participation. Best practices in existing transportation evaluations rarely consider the benefits derived from unlocking suppressed demand for out-of-home activity participation among households with fewer mobility choices.

The traditional benchmark of housing affordability is no more than 30% of household income. However, a considerable proportion of a household's expenditure can be transportation[4]. Another benchmark has recently been considered considering geographic affordability which combines both housing and transportation costs. Typically, the benchmark for affordability using this measure is no more than 45% to 50% of a household's income. There is a common perception that housing in areas farther away from densely populated city centres is more affordable. However, in many cases, the increase transportation costs to work due to longer

[2] Todd Litman, 'Evaluating Transportation Equity', Victoria Transport Policy Institute, Victoria, British Columbia, https://www.vtpi.org/ (Accessed: October 22, 2021)
[3] Dr. Steven Farber et al, 'Planning for Transit Equity in the GTHA', University of Toronto, Toronto, Ontario, https://uttri.utoronto.ca/files/2019/06/Planning-for-Transit-Equity-in-the-GTHA-Report-May-29-2019.pdf (Accessed: October 22, 2021)
[4] Eric Miller et al, Travel and Housing Costs in the Greater Toronto Area, Neptis Foundation, https://neptis.org/sites/default/files/toronto_metropolitan_region_travel_and_housing_costs/travel_housing_costs_executive_summary.pdf (Accessed: October 22, 2021)

average trip lengths, reliance on the automobile, and higher automobile ownership offsets the potential savings of housing in a sub-urban or rural setting.

1.4 Emerging Technologies and Equity

Ride-sharing apps, micro-mobility such as electric scooters, on-demand transit and other emerging transportation technologies are disrupting traditional transportation systems. When these technologies are introduced by private providers, there can be a risk that the social benefits that are produced are not the same for everyone. Certain populations may encounter barriers to access these technologies such as affordability or physical access. Socio-economic impacts are usually considered after implementation and not during the planning process. Utilizing an equity framework in the planning process means that equity and fairness issues are recognized early in the process and implementation plans focus on remedying any imbalances. A few technologies that will be discussed in this memo are described below.

Rideshare

Much like existing ride-sharing services, on-demand transit offers a flexible, cost-efficient and environmentally safe alternative to traditional fixed-route mass transit. It allows riders to book their trip via an app, which uses an algorithm to program the most fast and fuel-efficient route for the bus driver to pick-up and drop-off passengers. The fleet for on-demand transit can consist of small/medium vehicles such as buses, taxes and vans. Tech companies specializing in the development of on-demand transit apps include Pantonium, Rideco, Spare and more.

Demand-responsive transit ensures that no buses are running empty, as can be seen for fixed-route buses servicing areas of lower transit-demand during off-peak periods; this ultimately achieves better fuel and cost economy as it would require a much smaller bus fleet with efficient routing. Additionally, hybrid on-demand routes that make scheduled stops at major destinations, such as senior homes, may also be considered.

The primary limitation of on-demand transit is the need for users to own smartphones. The use of the transit app may be a challenge for low-income people, seniors and potentially those that struggle with English.

Since the onset of the stay-at-home orders and social distancing regulations due to the COVID pandemic, a few municipalities within Ontario have taken the opportunity to fast-track or expand their on-demand transit. Belleville, for example, began experimenting with the on-demand transit model in 2018 via a night bus. This service proved successful and was expanded to include 3 service buses.

Carshare

Car sharing is a short-term rental of a vehicle. Payment is usually done by the hour. Conventional use of car sharing is done with established car rental agencies where they use their existing fleet to rent to trip takers. Other businesses have agreements with municipalities or private institutions such as condominiums to allow their fleet to be parked and stored in exchange for their use. These businesses can have a subscription model depending on the number of required uses by the member.

Car-sharing operators such as Zipcar sometimes make agreements with businesses or condominiums which allows the operator to store and park their fleet there and in exchange the operator provides discounted subscriptions to users who work in that business or live in the condominium. Users can find and pay for their carshare using a smartphone application. This allows these shared vehicles to be used outside of office hours and does not require an employee to confirm the car-sharing agreement. Technological innovations have also allowed the sharing of people's private automobile to others using smartphone applications such as Toro.

Bikeshare

Bike sharing is a shared transport service in which bicycles are made available for shared use to trip takers on a short-term basis. The bike is usually locked and unable to be used until the trip taker pays for the short-term rental. Most bike share systems use a system where the bike is locked to a dock and payment is made at booths adjacent to these docks. Users then input their payment information to unlock the bicycle. Users then finish their bike-share trip by locking their bicycle to the same or different dock.

Alternatively, bike share programs can have dockless or floating bikes. With recent technological innovations, these dockless bicycle programs have their bicycle inventory connected to GPS and users can find and pay for their use using a smartphone application.

2.0 Equity Evaluation

An equity evaluation requires the identification of equity-seeking groups and a set of mobility equity indicators that targets the needs of those groups. This evaluation understands and takes into consideration that the needs of communities differ for each equity-seeking group.

2.1 Categorizing Populations

Equity evaluation requires populations to be categorized by demographic and geographic factors to evaluate their needs and measure the benefits and costs of the services and goods they receive. How these populations are categorized depend on the vision of system that is aiming for equity. A list of common equity-seeking categories as it relates to transportation can be found in Table F-1.

Table F-1: Equity-Seeking Groups

Equity-Seeking Groups	Description
Vulnerable Road Users	Pedestrians, cyclists, motorcyclists, and transit users are more vulnerable on roads as they are not protected within the confines of their personal automobile.
Geography	Various neighbourhoods can have different access to transportation services.
Ability	Person with disabilities or English proficiencies or special medical needs.
Age	There are mobility constraints with children as they are too young to drive, and they are usually walking or cycling to school. The elderly may have physical limitations causing mobility challenges.
Financial Means	This includes persons with low income, unemployed persons, single parent families, and households who devote a larger proportion of income to transportation.
Race and Heritage	This includes Racialized groups, recent immigrants, or Indigenous peoples.
Gender	This includes women and other gender identities.
Caregiver	This includes those with children or independents.

2.2 Equity Indicators

Transportation services, infrastructure, and programs provide benefits and costs to a number of different factors. Traditionally the focus in mobility and transportation planning was reducing congestion. However, by addressing the need of communities with clean, sustainable mobility options, communities will also receive societal benefits, including positive health impacts, increased quality of life, and greater employment and education opportunities. Potential solutions and strategies should undertake an evaluation based on a set of indicators. The indicators that are presented in Table F-2 take into consideration more than congestion and mobility, but also consider environmental and economic opportunities and benefits[5].

[5] Creger et al., Mobility Equity Framework', *Greenlining Institute*, Oakland, California. https://greenlining.org/publications/2018/mobility-equity-framework/. (Accessed October 21, 2021)

Table F-2: Transportation Indicators

Indicators	Description
Affordability	This metric will vary by location. A common threshold is that a household should spend no more than 20% of budgets on transportation costs.
Accessibility	Physically accessible, accessible with various culture/languages, accessible payment systems (not relying on 1 method such as the smartphone)
Efficiency	Frequency of transit, travel times, time spent in traffic, optimal availability of parking, etc
Reliability	Consistency and variability of travel times
Safety	Collision rate and severity
Reduction in Greenhouse Gas Emissions	Quantities of greenhouse gas reduction
Air Quality	Quantities of air pollutants (PM, NOx) reduction, level of physical activity
Reduction in Vehicle-Kilometres Traveled	Compact and transit-oriented development, and land use
Connectivity to Places of Employment, Education, Services, and Recreation	Number of households by income within walking distance to schools and services. Number of households within 30-minute transit ride or 20-minute auto ride to employment centers.
Inclusive of Local Business and Economic Activity	Local hire agreements, increased foot traffic to local businesses, new businesses created, increased property values, benefiting the local community without displacing residents, etc.

3.0 Needs Depending on Land Use Categories

Another method of assessing transportation needs is by understanding that transportation needs are different depending on the rural or urban structure of the community.

Urban areas are defined as areas of mixed-use development, high density, and connectedness of destinations. Caltran's Smart Mobility Framework[6] recommends prioritization of transportation projects and programs that:

- Improve the connectivity of employment and transportation hubs.
- Allocate street space to benefit high-occupancy and non-motorized modes.
- Promote complete streets (streets designed to enable safety for all users, including pedestrians, cyclists, motorists, and transit riders of all ages and abilities).

Suburban areas are defined as areas that are lower-density area or mixed-use development outside of a larger city. The Smart Mobility Framework recommends prioritization of transportation projects and programs that:

- Invest in complete streets and safer walking and biking conditions.
- Increase commute transit service and ridesharing.
- Improve connectivity to reduce trip lengths and increase non-auto trips.

Rural areas are defined as areas with very low population density and highly dispersed destinations. The Smart Mobility Framework recommends prioritization of transportation projects and programs that:

- Create and maintain walkable rural towns and safety improvements on rural roads.
- Connect networks of schools, services, and employment destinations.

An example of this framework being applied to 10 transportation modes using the equity evaluation and indicators found in Section 2.2 is shown in Table F-3.

Table F-3: Example Smart Mobility Framework

Priority	Urban	Suburban	Rural
1	Active Transportation	Active Transportation	Rideshare
2	Electric Public Transit	Electric Public Transit	Active Transportation
3	Conventional Public Transit	Conventional Public Transit	Personal Electric Vehicles
4	Rideshare (Car/Vanpool, Microtransit)	Rideshare (Car/Vanpool, Microtransit)	Electric Public Transit
5	Bikeshare	Ridehailing	Conventional Public Transit
6	Carshare	Bikeshare	Personal Gas Vehicles

[6] Creger et al., Mobiility Equity Framework', *Greenlining Institute*, Oakland, California. https://greenlining.org/publications/2018/mobility-equity-framework/. (Accessed October 21, 2021)

Priority	Urban	Suburban	Rural
7	Taxis	Carshare	Carshare
8	Ride-hailing	Personal Electric Vehicles	Ridehailing
9	Personal electric vehicles	Taxis	Bikeshare
10	Personal Gas vehicles	Personal Gas Vehicles	Taxis

In urban areas, sustainable and clean modes such as active transportation and electric public transit are prioritized the highest. There are also local economic benefits in construction, operation, and maintenance of a transit system and transit employees are usually unionized and the employer practices fair employee rights. Ride-hailing, carshare, and bikeshare scored in the middle due to their lack of accessibility and affordability in low-income areas. Gas-powered and single occupancy vehicle modes scored lower as they did not reduce air pollution and greenhouse gas emissions. Ride-hailing is scored lower than taxis.

The priorities of sub-urban areas are similar to urban areas, however there is more emphasis on the first and last mile connections to conventional public transit as stops are more spaced. Although taxis have stronger labour practices (ex. Unionized), ride-hailing was deemed more accessible and feasible to implement in this suburban example.

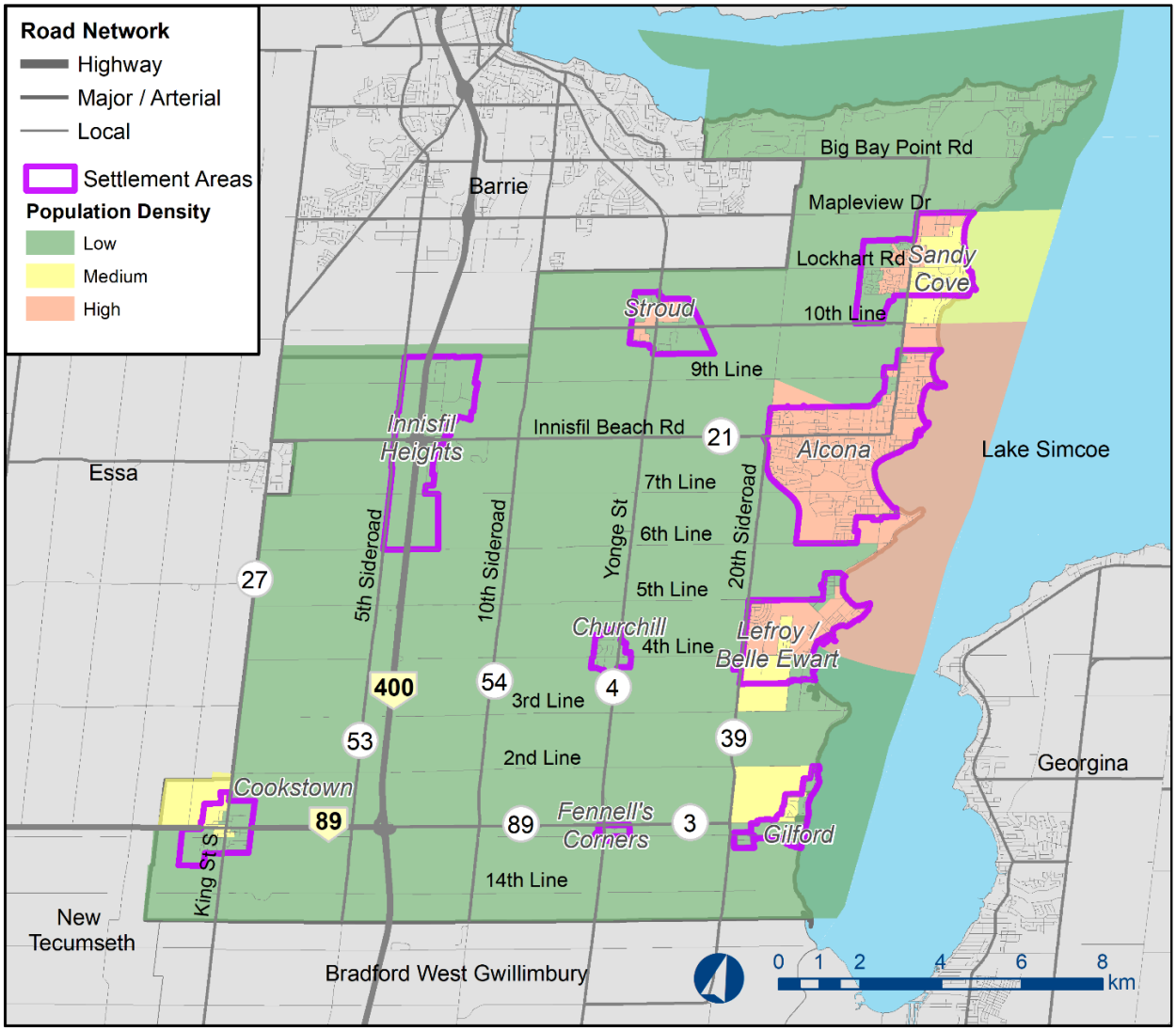
In a rural setting, rideshare and microtransit are most prioritized as on-demand transit can be adapted and scaled to rural communities. Due to dispersed housing and destinations, personal vehicles are prioritized higher than in sub-urban and urban settings. However personal electric vehicles are prioritized higher due to its environmental benefits.

To apply an equity framework to the Town of Innisfil, the Town would have to be divided into similar land use categories such as “urban”, “sub-urban”, and “rural” areas. Statistics Canada categorizes population centres as areas that have a population of at least 1,000 persons and a population density of at least 400 persons per square kilometre. The 400 persons per square kilometre is considered a primary population density threshold. A secondary population density threshold is 200 persons per square kilometre.

Given the overall rural nature of the Town of Innisfil, the three land use categories that were be used will be high-density, mid-density, and low-density areas. A high-density area will have a population density of over 400 persons per square kilometre. A medium-density area will have a population density of between 200 and 400 persons per square kilometre, A low-density area will have a population density of below 200 persons per square kilometre.

These definitions were applied to the Town of Innisfil using Statistics Canada’s Dissemination Area geography and 2016 Census data which reports population, land area, and population density. The results are found in Figure F-1.

Figure F-1: Rural, Sub-urban, and Urban Areas in the Town of Innisfil

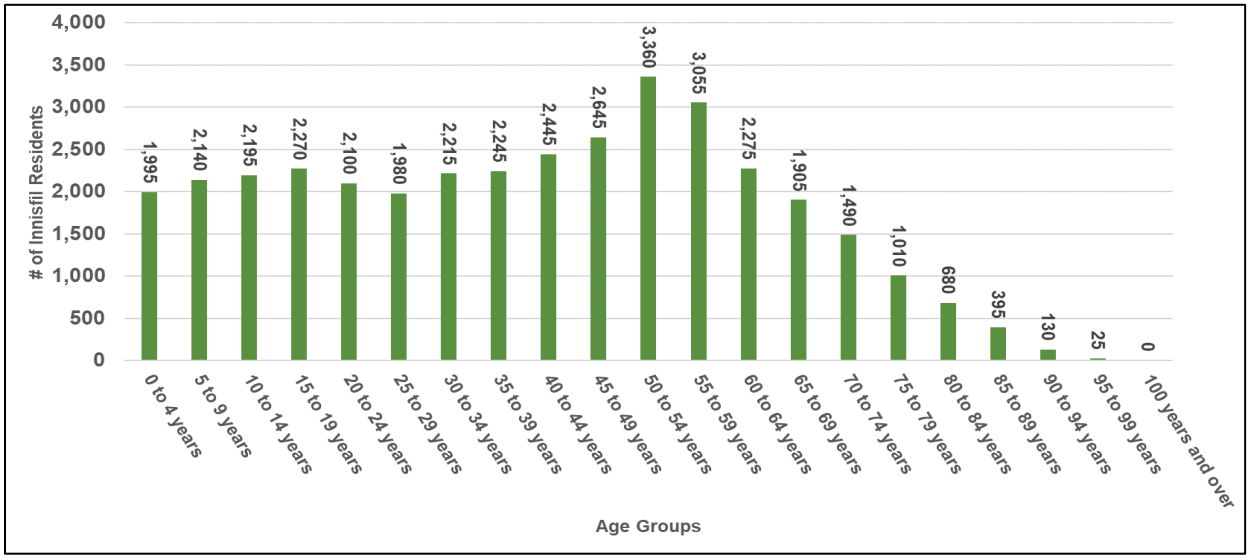


4.0 Transportation Equity in the Town of Innisfil

4.1 Sociodemographic Factors

Sociodemographic factors for Town of Innisfil residents were assessed based on 2016 Statistics Canada Census data. At the time of writing, 2021 Census data was not available and is predicted to be available early-2022. The age profile of residents in the Town of Innisfil are shown in Figure F-2.

Figure F-2: Town of Innisfil Residents Age Profile (2016)



The average age of Town of Innisfil residents is 40.7 years old, which is similar to that of the Province of Ontario which is 41.0 years old.

The private household size for Town of Innisfil residents is shown in Figure F-3. Average household size is 2.7 persons per household. According to Burnside analysis of the 2016 Transportation Tomorrow Survey data, average vehicle ownership per household is 2.2 vehicles per household.

The gross annual household income is shown in Figure F-4.

Figure F-3: Town of Innisfil Private Household Size (2016)

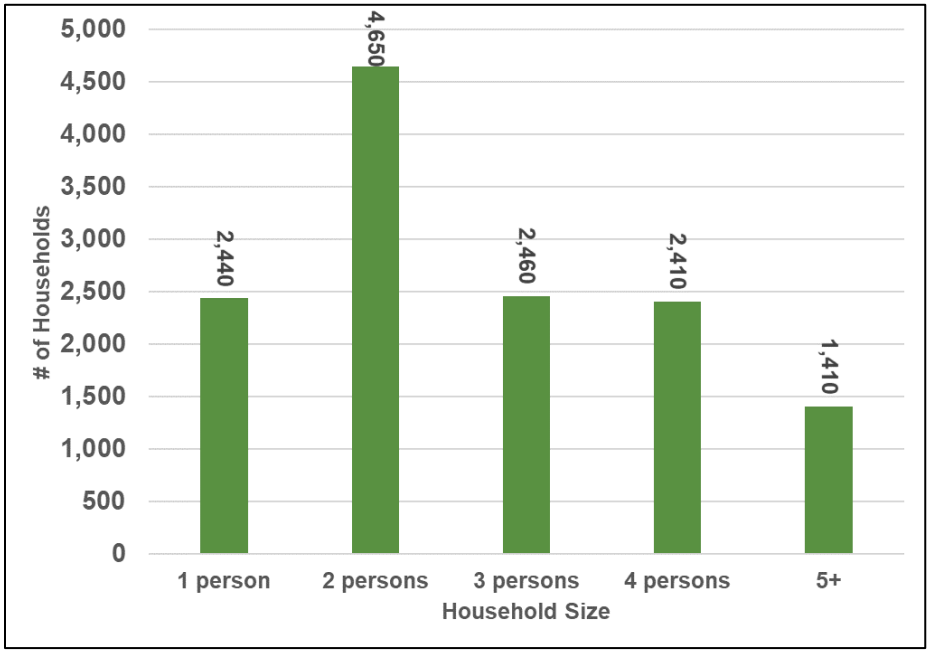
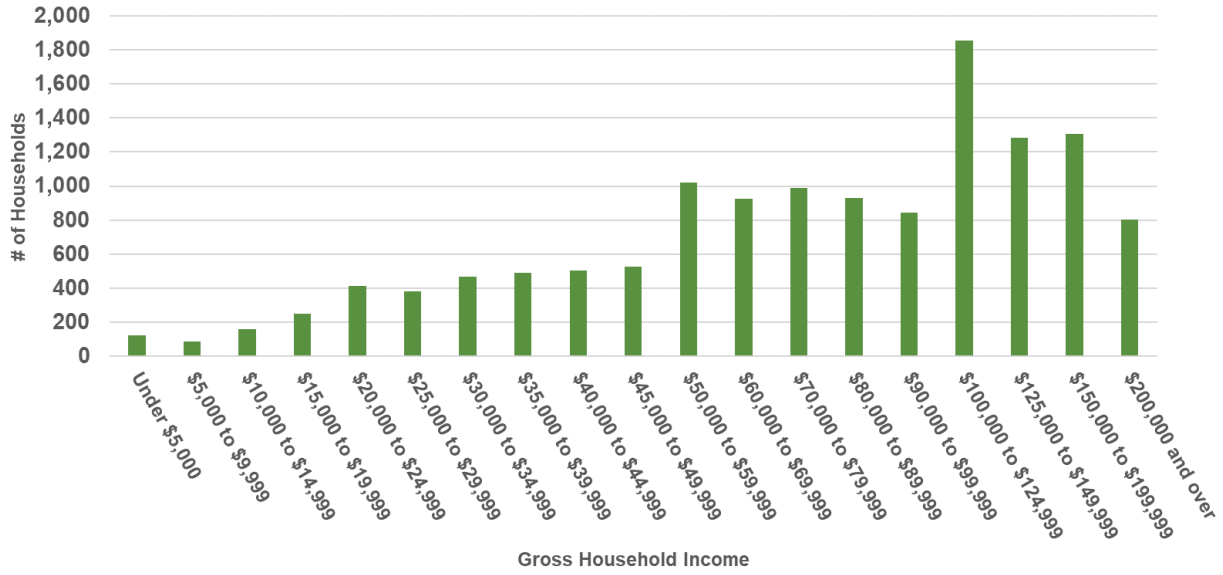


Figure F-4: Town of Innisfil Gross Household Income (2015)



4.2 Innisfil's Fair Transit Program

The Innisfil Transit service is a program that currently partners with Uber to provide on-demand ridesharing. The fare structure has changed since the inception of the program. Individuals are only permitted 30 trips per month unless they are granted an exemption. There are certain origins and destination that have fixed fares as shown in Table F-4.

Table F-4: Innisfil Uber Transit Fixed Fares

Origin and Destination	Fare
To/From Innisfil Recreation Complex/Town Hall area	$4
To/From closest GO bus stop along Yonge Street	$5
To/from Barrie South GO train station	$6
To/from Innisfil Heights Employment Area and Highway 400 carpool lot	$6
To/from IdealLab and Lirbary (Alcona)	$4
To/from South Innisfil Community Centre (Lefroy)	$4

A $4 discount is provided off regular fare for custom origin and destinations within Innisfil that are a minimum of $4 per trip. Annual ridership is estimated to be approximately 80,000 users (Innisfil Transit System Performance, Ryerson, 2021) with 220,000 Innisfil transit trips undertaken between May 2017 and February 2020.

Innisfi's Fair Transit Program aims to remove financial barriers to transit for low-income households in Innisfil. To be eligible for this program, your income must be below a certain threshold based on family size. These thresholds include:

- Family size 1 with Income after tax below $17,536.
- Family size 2 with Income after tax below $21,344.
- Family size 3 with Income after tax below $26,577.

- Family size 4 with Income after tax below $33,157.
- Family size 5 with Income after tax below $37,757.
- Family size 6 with Income after tax below $41,874.
- Family size 7+ with Income after tax below $45,989.

4.3 Innisfil's Transit for Teens

Innisfil's Uber Transit system allows teens from ages 13 to 17 to use Uber Transit with special consent from parents. The parental consent allows increased accessibility for teens.

4.4 Equity Assessment

There are inherent vertical and horizontal equity built into the existing Innisfil transportation system. The current urban and rural structure of the Town of Innisfil, wide range of income groups and age categories, and average household size being greater than the average household car ownership suggest that planning for a multi-modal transportation system is critical to achieve social objectives. There are opportunities for alternative transportation strategies to strive to maintain and build upon these achievements.