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Transit-Supportive Development Along Bus Corridors

Opportunities for the Greater Toronto and Hamilton Area

Janelle Lee and Carolyn Kim

February 2020

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Executive summary

Continued investments in public transit and building a diversity of housing types within walking distance of transit stations and corridors, known as transit-supportive development (TSD), will be critical as the Greater Toronto and Hamilton Area grows. This report studies opportunities in the GTHA for mid-density housing development, particularly around bus corridors, and benefits these investments can bring.

Although the focus of TSD policies often revolve around pairing high-density housing with subways and light rail transit, investments in bus rapid transit and mid-density housing can be equally important. Mid-density housing, such as row houses, duplexes, and low-rise apartments, can help increase housing supply and choice, while promoting walkability and staying true to the residential character of many neighbourhoods. Bus services also play an integral role in connecting people and places in the GTHA and the opportunity to accommodate gentle growth along bus corridors should not be overlooked.

Chapter 2 discusses the role of bus service in TSD and its ability to guide compact, mixed-use urban form in the GTHA. Pairing mid-density housing development with bus corridors can help reduce auto dependency, particularly in less populated neighbourhoods. Existing research also shows that investment in bus services can mitigate the decline in transit ridership overall and even sustain and increase it.

Chapter 3 looks at specific neighbourhoods in the City of Toronto and Mississauga as examples of where increased mid-density housing can occur in the GTHA. Single family homes currently make up the biggest share of housing types across the region, proving ample opportunity for mid-density housing to support anticipated population growth. An examination of specific neighbourhoods in Toronto and Mississauga shows that there is a relationship between housing type and transportation mode. Neighbourhoods with more mid-density housing have higher levels of transit and active transportation (ex. Walking or cycling) use compared to neighbourhoods dominated by single-detached housing.

In order to realize the benefits of TSD in mid-density communities, housing developments and transportation planning must be fully integrated. This report shows that under the right conditions, a greater share of mid-density housing is related to lower auto use and greater active transport and transit trips, resulting in reduced congestion, cleaner air, and more connected cities.

1. Greater housing around transit is a smart investment

The Greater Toronto and Hamilton Area (GTHA) is the fastest growing region in Canada, with an expectation to grow to more than 10 million people and 4.8 million jobs by 2041. Although the GTHA is one of the most attractive places to newcomers and businesses in Canada, the region is challenged to keep up in providing the housing and transit services needed to meet a growing population and economy.

Continued investments in public transit and building a diversity of housing types within walking distance of transit stations and corridors ("transit-supportive development") will be critical as the GTHA grows. Currently, municipalities face a complexity of housing challenges, including a lack of suitable and affordable housing in close proximity to high-quality public transit. When cities incorporate a greater mix of development and invest in improved transit service, households and the broader community can realize a return on their investment, including:

- **Benefits to households and taxpayers:** Living near transit-friendly communities can lower household transportation and housing costs.[1] Non-residential and multi-family property values increase significantly when redeveloping near rapid transit.[2] Targeting development in areas with established municipal services and infrastructure in higher-density urban areas rather than low-density rural areas results in annual cost savings for households: savings of 11% for road-building costs and 6% for water and sewer costs, 3% for annual operations and service delivery.[3]
- **Increased transit ridership:** Reliable and frequent public transit provides commuters with greater mobility options. Investments in bus services specifically can mitigate the decline in transit ridership and even sustain and increase it.[4]
- **Economic growth and development:** Compact development is an effective way to attract new businesses' investments and economic development and improve mobility

[1] Carolyn Kim, *The Way to GO* (Pembina Institute, 2019), 6. https://www.pembina.org/reports/the-way-to-go-final.pdf

[2] L. Cox et al., "Exploring Synergies Between Trasnit Investment and Dense Redevelopment: A Scenario Analysis in a Rapidly Urbanizing Landscape," *Landscape and Urban Planning* 167 (2017).

[3] Mark Muro and Robert Puentes, *Investing in a Better Future: A Review of the Fiscal and Competitive Advantages of Smarter Growth Development Patterns* (The Brookings Institution Center on Urban and Metropolitan Policy, 2004). https://www.brookings.edu/wp-content/uploads/2016/06/200403_smartgrowth.pdf

[4] Genevieve Boisjoly et al., "Invest in the ride: A 14 year longitudinal analysis of the determinants of public transport ridership in 25 North American cities," *Transportation Research Part A* 116 (2018), 434.

for commuters when pursued in conjunction with transit. In fact, redevelopment without rapid transit fails to stimulate employment and population growth.[5]

- **Improved public health:** Higher population density near transit and in more compact, walkable communities reduces the number of on-road carbon emissions.[6] The average household carbon footprint in large urban cities are lower than households in suburban or rural towns.[7]

[5] Richard Florida, "Cities with Denser Cores Do Better," Citylab, November 28, 2012. https://www.citylab.com/life/2012/11/cities-denser-cores-do-better/3911/

[6] Ramana Gudipudi, Till Fluschnik, Anselmo Garcia Cantu Ros, Carsten Walther and Jurgen P. Kropp, "City Density and CO_2 Efficiency," *Energy Policy* 91 (2016).

[7] Christopher Jones and Daniel Kammen, "Spatial Distribution of U.S. Household Carbon Footprints Reveals Suburbanization Undermines Greenhouse Gas Benefits of Urban Population Density," *Environmental Science and Technology* 48 (2014).

2. The role of bus service in transit-supportive development

Building vibrant mixed-use communities around rapid rail transit (e.g. GO train, subways, and light-rail) is an important part of TSD and is often the focus of transportation and housing research and policies. High-density housing developments (e.g. high-rise apartments and condos) are often built near rail stations and corridors to generate the ridership needed to make capital intensive rail projects viable. This is because transit ridership increases as population density increases.[8] Research in Toronto and surrounding municipalities indicates that high-rise and low-rise apartments and duplexes are associated with higher transit use.[9] These findings are not exclusive to Toronto — similar research in Portland, Oregon also finds that rail passengers are more likely to walk to train stations in areas with higher population density.[10] However, in regions like the GTHA where many communities are dominated by single-detached homes, high-density housing developments do not always suit the character of a neighbourhood. Mid-density housing, such as row houses, duplexes, and low-rise apartments, can help increase housing supply and choice, while promoting walkability and staying true to the residential character of many neighbourhoods.[11]

Although the focus of TSD policies often revolve around rail transit and high-density housing, TSD is also critical to mid-density neighbourhoods. Bus services play an integral role in connecting people and places in the GTHA and the opportunity to accommodate gentle growth along bus corridors should not be overlooked. In Toronto, nearly half of the city's total transit ridership in 2017 was from passengers travelling by bus.[12] Annual boardings on MiWay, Mississauga's transit agency which provides local and express bus service, has increased every year since 2014.[13]

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[8] Ralph Buehler, "Determinants of transport mode choice: a comparison of Germany and the USA," *Journal of Transport Geography* 19 (2011), 652.

[9] Pierre Filion, Kathleen McSpurren and Brad Appleby, "Wasted density? The impact of Toronto's residential-density distribution policies on public-transit use and walking," *Environment and Planning A* 38 (2006), 1385.

[10] Asa Bergman, John Gliebe and James Strathman, "Modeling Access Mode Choice for Inter-Suburban Commuter Rail," *Journal of Public Transportation* 14 (2011), 37-38.

[11] Jeff Evenson, Ariana Cancelli, Keir Matthews-Hunter, Michelle German and Julie Fader, *What is the Missing Middle? A Toronto housing challenge demystified* (Evergreen and Canadian Urban Institute, 2018), 5. https://www.evergreen.ca/downloads/pdfs/2018/What_is_the_Missing_Middle_Evergreen_CUI_s2.pdf

[12] Toronto Transit Commission, "2017 Operating Statistics: Conventional System," https://www.ttc.ca/About_the_TTC/Operating_Statistics/2017/section_one.jsp

[13] MiWay, *2019-2022 Business Plan & 2019 Budget* (2019), D-9. http://www7.mississauga.ca/eCity/Budget/img/serviceareas/business-plans/2019-miway-summary.pdf

Conventional bus and bus rapid transit (BRT) — buses in dedicated rights-of-way or grade-separated roadways — services are sometimes questioned for their ability to reduce car use and promote more sustainable forms of urban growth. This is partly because they are thought to provide lower regional accessibility and connectivity compared to faster and more geographically extensive rail services.[14] However, establishing BRT over time can be fundamental to guiding compact, mixed-use urban form.[15] Research also shows that investment in bus services can mitigate the decline in transit ridership overall and even sustain and increase it.[16]

One of the major benefits of bus service is that it provides flexibility — bus routes can be easily adapted to serve less populated areas. For BRT services in particular, the same vehicle can provide feeder services in low- and mid-density neighbourhoods and subsequently operate in higher density corridors on a dedicated right-of-way. Buses therefore provide a flexible and cost-effective way to provide transit service in communities with varying densities. For mid-sized cities where future population growth is expected to be greatest (e.g. outer suburbs of the GTHA) but do not yet have the density or resources for rail infrastructure, pairing frequent bus service with mid-density housing can be an effective way to guide sustainable transport and compact development.[17]

[14] Robert Cervero and Danielle Dai, "BRT TOD: Leveraging transit oriented development with bus rapid transit investments," *Transport Policy* 36 (2014), 129.

[15] Ibid., 137.

[16] Boisjoly et al., "Invest in the ride."

[17] Cervero and Dai, "BRT TOD," 128.

3. Opportunities for mid-density transit-supportive developments

Providing a diversity of housing options is an important foundation to growing cities and economies. Housing choice refers to the diversity of housing types that are available to prospective homeowners and renters. By providing greater housing choice, residents are able to live in a home that matches their budget and housing needs, and accommodate changing life-stages of individuals and households.[18] For example, aging populations and empty-nesters may no longer require a home with multiple bedrooms, and should have the option to downsize to a smaller unit. Increasing housing diversity can help provide more affordable housing options for potential buyers, which helps open up rental options to relieve vacancy issues in Toronto and the GTHA.[19]

Evaluating housing diversity is one way for planners and policymakers to understand the level of housing choice available in communities. This, together with other indicators on transit service and function, real estate market potential, community structure and composition[20], can identify where mid-density development can be encouraged through area-specific policies, planning efforts, and public realm investments. Table 1 provides an overview of the proportion of dwelling types in the GTHA. Single-detached housing is by far the most prevalent dwelling type in most parts of the region while mid-density housing units comprise 20-25% of dwellings.

[18] Magdalena Les and Chris Maher, "Measuring Diversity: Choice in Local Housing Markets," *Geographical Analysis* 30, no. 2 (1998), 173.

[19] Canadian Urban Institute, *Scaling Up Affordable Ownership Housing in the GTA* (2017), 11. https://static1.squarespace.com/static/546bbd2ae4b077803c592197/t/5a5f8b0571c10bedb02949c1/1516210974821/CUIPublication.ScalingUpAffordableHousingGTA.2017.pdf

[20] Pembina and Evergreen, *How to create vibrant transit supportive communities: A typology and evaluation tool.* (2019). https://www.pembina.org/pub/how-create-vibrant-transit-supportive-communities

Table 1. Proportion of dwelling types in the GTHA

Dwelling Type	Durham	Halton	Hamilton	Peel	Toronto	York
Single - detached	67%	58%	57%	46%	24%	64%
Semi-detached	5%	5%	3%	12%	6%	6%
Mid-density*	21%	25%	24%	24%	25%	20%
High-rise apartment	7%	11%	16%	19%	44%	10%

Data source: Statistics Canada[21]

* Sometimes referred to as missing middle housing; includes row houses, apartments or flats in a duplex, low-rise apartments, and other single-attached houses.

Due to rounding, figures may not add up to 100%.

In order to identify opportunities for greater mid-density housing, housing diversity must be examined at the neighbourhood level. There are several neighbourhoods in the GTHA where single- and semi-detached housing account for a large share of the housing mix and are prime for new mid-density developments to increase housing diversity. In communities such as Markland Wood, Edenbridge-Humber Valley, and Willowridge-Martingrove-Richview in Toronto (Figure 1), the share of single-detached units is almost equivalent to the share of high-rise apartments (Figure 2). What is missing in these communities is a more even balance of housing types — mid-density housing would help increase the "in-between" housing that the market is lacking.

[21] Statistics Canada, 2017. "Census Profile, 2016 Census," Household and Dwelling Characteristics. https://www12.statcan.gc.ca/census-recensement/2016/dp-pd/prof/index.cfm?Lang=E

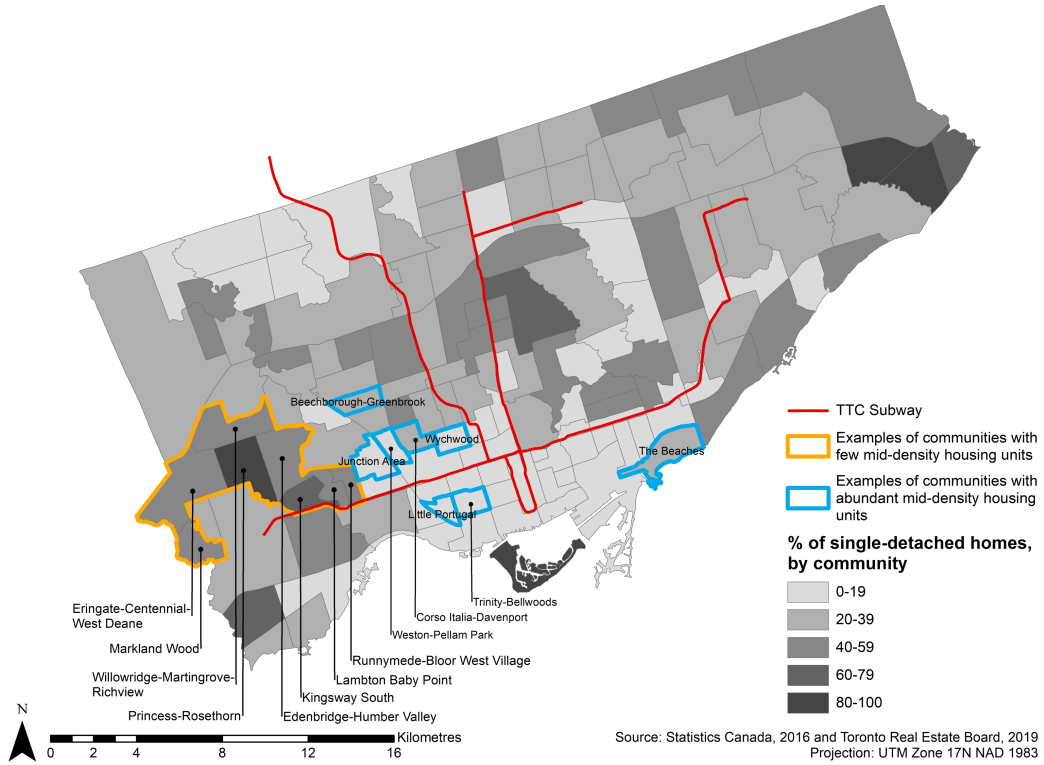

Figure 1. Single-detached housing in Toronto

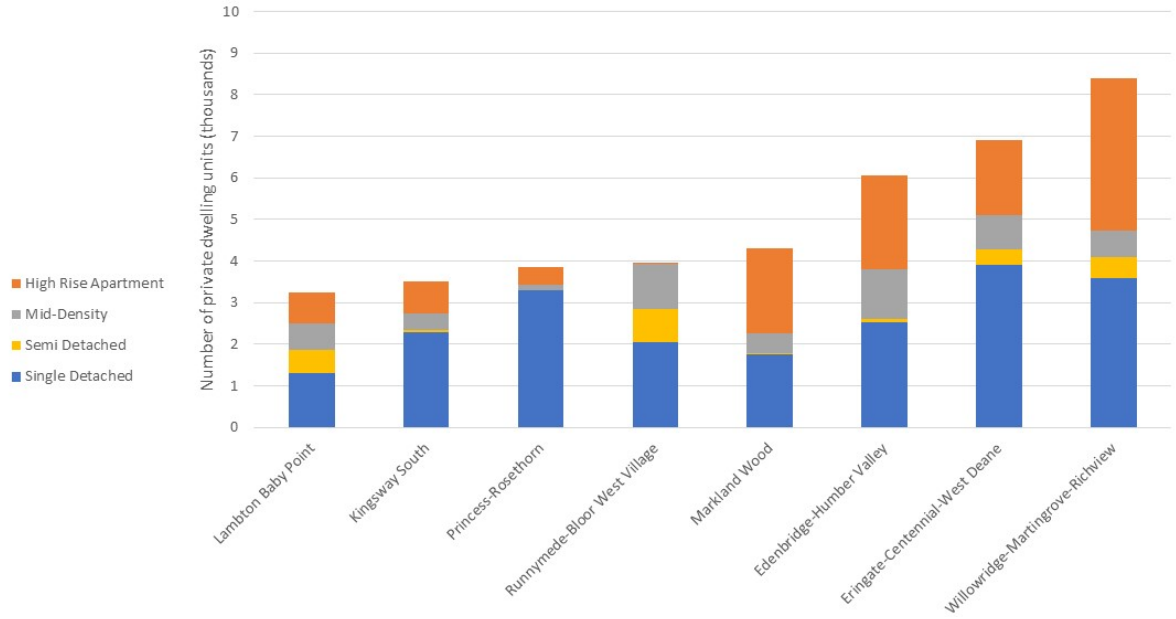

Figure 2. Housing diversity in select communities in Toronto with potential for greater mid-density housing

Data source: Statistics Canada[22]

[22] Statistics Canada, "Census Profile, 2016 Census," Profile of Census Tracts: Household and dwelling characteristics. https://www12.statcan.gc.ca/census-recensement/2016/dp-pd/prof/index.cfm?Lang=E. Census tracts used are listed in Appendix A.

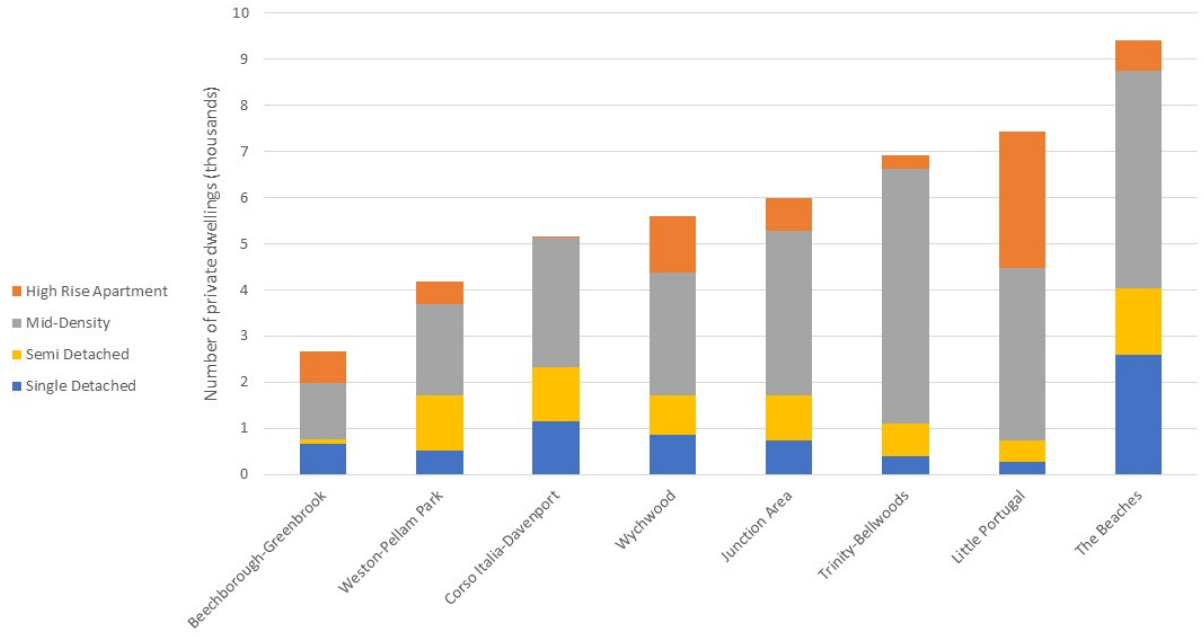

Figure 3. Housing diversity in select communities in Toronto where mid-density housing is abundant

Data source: Statistics Canada[23]

Examples of communities in Toronto where mid-density housing is abundant are identified in Figure 3. In these communities, a larger share of trips are made by transit, walking, and cycling compared to communities where single-detached units are the dominant housing form (compare Figures 4 and 5). Auto trips account for 43-65% of all trips in the selected mid-density neighbourhoods, compared to 56-81% in areas where mid-density housing is lacking. It should be noted that housing costs in mid-density neighbourhoods can be expensive and are not always affordable to those looking to enter the home ownership market. In 2019, the average home price in Toronto was approximately $925,500 while the average home prices in neighbourhoods with many mid-density dwellings such as Trinity-Bellwoods, The Beaches, Wychwood, and Corso Italia-Davenport were more than $1 million.[24]

[23] Ibid.

[24] Toronto Real Estate Board, data supplied to Pembina Institute, November 21, 2019.

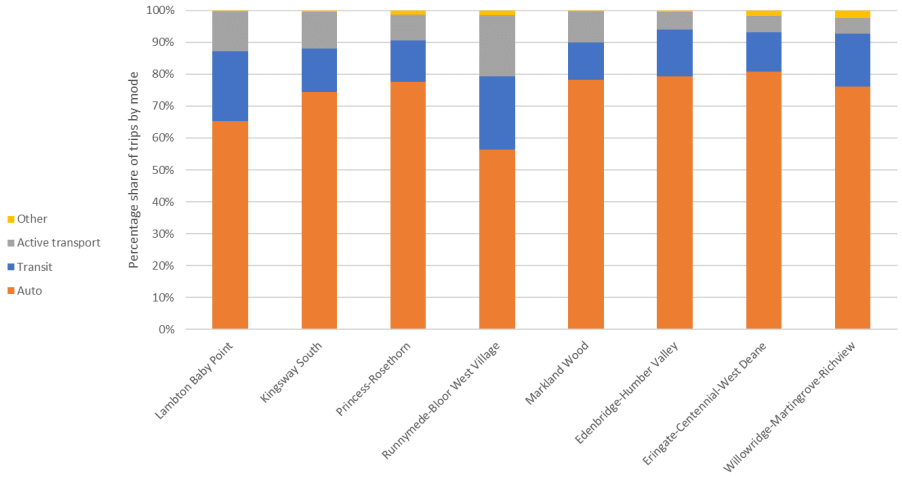

Figure 4. Mode split in Toronto communities with potential for greater mid-density housing

Data source: Data Management Group[25]

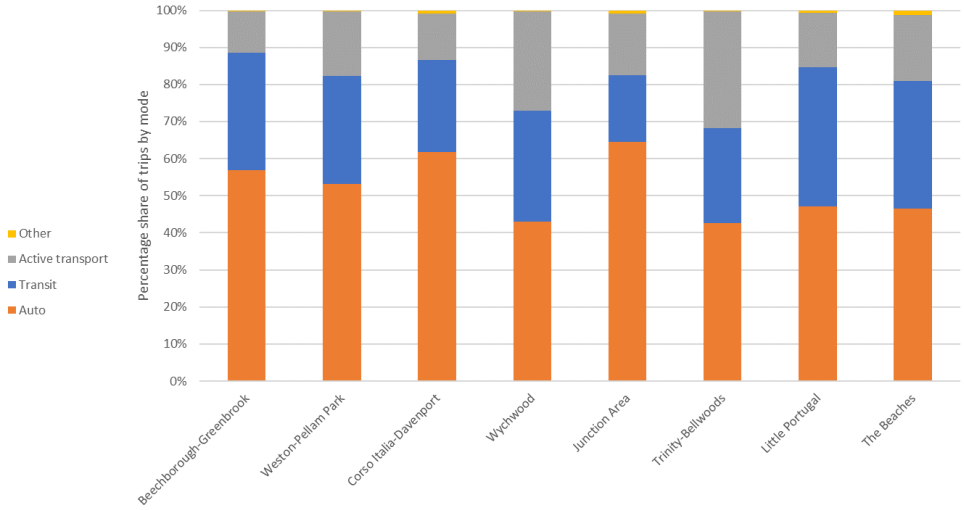

Figure 5. Mode split in Toronto communities where mid-density housing is abundant

Data source: Data Management Group [26]

Similar findings demonstrating the relationship between mid-density housing and transit and active transport trips can be found in Mississauga. Figures 6 and 7 show the housing diversity and mode split in Sheridan and East Credit, communities where single- and semi-detached units are the dominant housing type. In both communities, auto trips represent over 80% of trips. In contrast, Mississauga's Malton and Applewood neighbourhoods have a more balanced housing mix and approximately 70% of trips are made by car (see Figures 8 and 9). Transit and active transport make up a larger share of the modal split in these communities. Although the

[25] Data Management Group, "TTS Frequency Distribution – Trip – 2016 v1.1: Primary travel mode of trip filtered by 2006 GTA zone of origin." (Transportation Tomorrow Survey, 2016)

[26] Ibid.

difference in mode split is not as obvious as in the Toronto example, it suggests a positive relationship between mid-density housing and transit and active transport trips. Even if small modal shifts are made in each community to increase the share of sustainable transport modes, the net impact when all communities in the region are considered could be substantial.

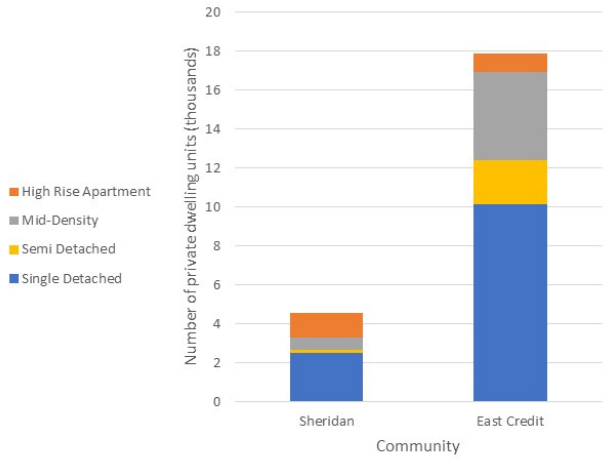

Figure 6. Housing diversity in select communities in Mississauga with potential for greater mid-density housing

Data source: Statistics Canada[27]

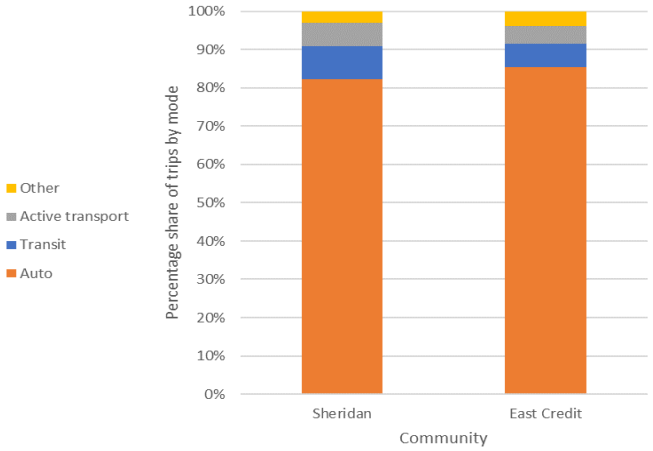

Figure 7. Mode split in select communities in Mississauga with potential for greater mid-density housing

Data source: Data Management Group[28]

[27] Statistics Canada, "Census Profile, 2016 Census," Profile of Census Tracts: Household and dwelling characteristics.

[28] Data Management Group, "TTS Frequency Distribution – Trip – 2016 v1.1: Primary travel mode of trip filtered by 2006 GTA zone of origin." (Transportation Tomorrow Survey, 2016)

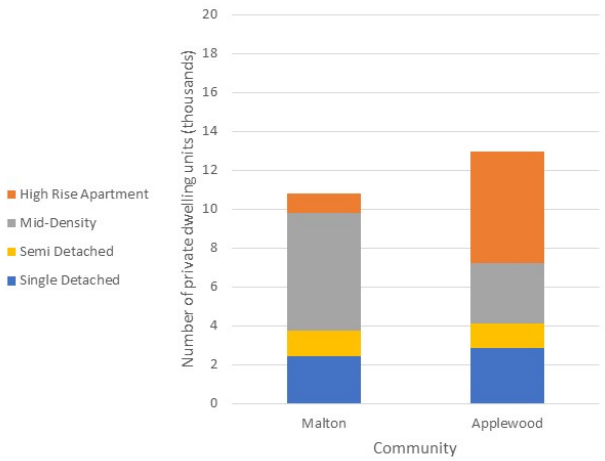

Figure 8. Housing diversity in select communities in Mississauga with greater mid-density housing

Data source: Statistics Canada[29]

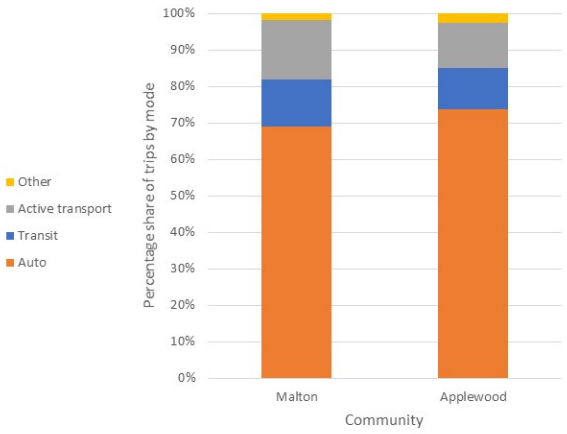

Figure 9. Mode split in select communities in Mississauga with greater mid-density housing

Data source: Data Management Group[30]

Ultimately, these examples corroborate existing research findings that transit ridership and active transport increase as density increases.[31,32,33] More importantly, they show that high-density housing is not the only housing form that can guide sustainable transport and compact development — mid-density housing also plays an important role in TSD. Of course, the connection between mid-density housing and transit use, walking, and cycling are not always clear across the GTHA. There are communities in the region where there is a reasonable share of mid-density housing, yet the share of auto trips remains as high as communities dominated by single-detached housing. In order to realize the benefits of TSD, mid-density housing developments and transportation planning must be fully integrated. Under the right conditions, a greater share of mid-density housing can yield lower auto use and greater active transport and transit trips.

[29] Statistics Canada, "Census Profile, 2016 Census," Profile of Census Tracts: Household and dwelling characteristics.

[30] Data Management Group, "TTS Frequency Distribution – Trip – 2016 v1.1: Primary travel mode of trip filtered by 2006 GTA zone of origin." (Transportation Tomorrow Survey, 2016)

[31] Buehler, "Determinants of transport mode choice."

[32] Filion et al., "Wasted density?"

[33] Bergman et al., "Modeling Access Mode Choice for Inter-Suburban Commuter Rail."

4. Recommendations

Mid-density development along key bus feeder services to major transit stations should be prioritized to increase the spread of mid-density housing types across the region, increase transit access and create a more compact, mixed-use urban form. To seize development opportunities around bus corridors, it is recommended that policymakers better integrate housing and transit planning by:

- Updating land-use plans and zoning bylaws to allow mid-density housing development along corridors with high-ridership bus feeder routes to major transit stations.
- Proactively engaging communities in exercises to develop a local vision on how growth can be gently integrated in "stable residential" neighbourhoods, especially in close proximity to major bus routes. As the province and Metrolinx creates a market-driven transit-oriented development strategy, consideration should be given to increasing mid-density development around key bus feeder routes to transit stations.
- Continuing policy and planning action to increase housing stock with frequent and reliable bus service given that the market alone may not always deliver developments at a price that is affordable to middle- and lower-income households.
- Improving bus service performance to complement enhancements and expansions to the rail transit system (e.g., GO Transit, subway, light-rail). Where warranted, upgrade high-ridership bus routes to bus rapid transit to reduce travel time for commuters and increase overall transit ridership.

Appendix A. Census tract information

Table 2. List of census tracts analyzed in each neighbourhood in Figures 2 to 9

Sheridan	East Credit	Malton	Applewood	Lambton Baby Point	Kingsway South	Princess-Rosethorn	Runnymede-Bloor West Village	Markland Wood	Edenbridge-Humber Valley
5350513.01	5350516.11	5350247.01	5350220.00	5350050.01	5350150.00	5350223.01	5350050.01	5350213.02	5350151.00
5350514.01	5350516.30	5350528.41	5350221.01	5350104.00	5350216.00	5350224.00	5350103.00	5350220.00	5350154.00
5350514.02	5350516.31	5350529.01	5350510.00	5350150.00	5350218.00	5350225.01	5350104.00	5350221.01	5350224.00
5350515.01	5350527.08	5350529.02	5350512.00	5350151.00	5350225.01	5350226.00	5350105.00	5350221.02	5350226.00
5350515.02	5350527.09	5350530.01	5350521.02	5350152.00	5350226.00	5350231.00	5350150.00	5350236.02	5350228.00
5350516.16	5350528.01	5350530.02	5350521.04	5350153.00	5350227.00	5350232.00	5350151.00	5350510.00	5350229.00
5350612.10	5350528.02	5350531.01	5350522.00	5350154.00	5350228.00	5350233.00	5350152.00	5350525.02	5350230.01
	5350528.12	5350531.02	5350523.00	5350216.00	5350229.00	5350234.00	5350153.00	5350526.02	5350230.02
	5350528.13	5350532.01	5350524.01	5350228.00	5350230.01	5350237.03			5350231.00
	5350528.15	5350532.02	5350524.02	5350230.01	5350231.00	5350238.01			5350232.00
	5350528.16	5350576.40	5350525.01						5350240.01
	5350528.18		5350525.02						5350240.02
	5350528.19		5350526.01						5350242.00
	5350528.32		5350526.02						
	5350528.33		5350527.02						
	5350528.40		5350527.04						
	5350528.42		5350527.05						
	5350528.43		5350527.06						
	5350528.46								
	5350528.47								
	5350550.01								
	5350550.02								

Eringate-Centennial-West Deane	Willowridge-Martingrove-Richview	Beechborough-Greenbrook	Weston-Pellam Park	Corso Italia-Davenport	Wychwood	Junction Area	Trinity Bellwoods	Little Portugal	The Beaches
5350221.01	5350231.00	5350158.00	5350098.00	5350107.00	5350093.00	5350098.00	5350009.00	5350005.00	5350001.00
5350221.02	5350232.00	5350159.01	5350106.00	5350108.00	5350109.00	5350100.00	5350010.01	5350010.01	5350020.00
5350222.02	5350233.00	5350159.02	5350107.00	5350109.00	5350113.00	5350101.00	5350010.02	5350042.00	5350021.00
5350233.00	5350234.00	5350170.00	5350108.00	5350110.00	5350114.00	5350102.05	5350039.00	5350043.00	5350022.00
5350234.00	5350237.01	5350171.00	5350109.00	5350111.00	5350115.00	5350103.00	5350040.00	5350044.00	5350023.00
5350235.01	5350237.02	5350172.00	5350110.00	5350112.00	5350116.00	5350105.00	5350041.00	5350045.00	5350024.00
5350235.02	5350237.03	5350173.00	5350111.00	5350113.00	5350117.00	5350106.00	5350042.00	5350046.00	5350025.00
5350236.01	5350238.01	5350279.02	5350155.00	5350114.00	5350118.00	5350107.00	5350043.00	5350047.02	5350026.00
5350236.02	5350238.02	5350280.00	5350158.00	5350160.00		5350108.00	5350045.00	5350047.03	5350078.00
5350237.01	5350239.00	5350281.01	5350159.01	5350161.00		5350152.00	5350056.00	5350053.00	5350079.00
5350237.03	5350240.01	5350281.02	5350159.02	5350163.00		5350153.00	5350058.00	5350054.00	5350339.00
5350247.01	5350240.02					5350155.00			
5350527.04	5350241.00								
5350528.35	5350243.02								