Increased Importance of Planned and Co-ordinated Transportation Infrastructure

Greater Golden Horseshoe

Research Report for the

Toronto Regional Real Estate Board

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Canadian Centre for Economic Analysis

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EXECUTIVE SUMMARY

The Greater Golden Horseshoe Region (GGH) is home to a large proportion of Ontario's population and jobs. In the last decade, the GGH has seen an increase in the population of 1.2 million people, a 13.5% rise, as well as an increase in the number of jobs by 470,000, equivalent to an 11% increase. These figures were expected to keep growing even before the federal government's recent announcement of increasing immigration levels into Canada by 55%.

With GGH accounting for two-thirds of Ontario's GDP and a quarter of the total Canadian GDP, it is essential that transportation infrastructure within the region keeps up with expectations for future economic prosperity and population growth. This includes infrastructure related to roads, public transport and active options such as cycling. The new federal immigration targets could mean an average yearly intake of 200,000 immigrants into the GGH over the next several years compared to the average of 112,000 between 2009 and 2019 - leading to estimates of 71% population growth and 63% job growth by 2051 relative to present-day figures.

This surge in population will put pressure on existing housing stock; over 250,000 additional dwellings will be needed to meet needs relating to evolving household structure and ageing residents, on top of the 1.5 million already targeted for the next decade. Mobility across cities and municipalities in this region will also be affected. Currently, less than half of those living in a given municipality also work in the same municipality. As a result, the current job location and transportation trends will need to change if travel is not to become unmanageable. It is thus imperative that transportation infrastructure continues to develop in order that GGH can remain competitive economically while providing citizens not only with access and mobility within their own cities and municipalities but among them as well.

Our analysis shows that both the planned population growth and the accelerated expected population growth from changes in immigration policies are expected to increase the number of daily commuters by 46%, from 4.6 million in 2019 to 6.8 million by 2051, of which 32% are transit trips and 68% are car trips.

The change in the number of daily transit commuters is expected to double the demand for transit by 2051, from 1.1 million daily transit trips in 2019 to 2.2 million daily transit trips by 2051. This demand is primarily driven by commuters less than 45 years of age and lower income families.

Daily car commuters are expected to grow by 28.8% by 2051, from 3.6 million daily car trips in 2019 to 4.6 million daily car trips by 2051. The change in daily car commuter trips is predominately driven by people over the age of 45 years, representing more than 60% of the change.

Table 1 Travel patterns in the GGH, 2019 and 2051

Statistic	2019 Prior to the Pandemic	2051 Remote Work Rates at 20%, Higher Growth
# of daily commuters	4,650,000	6,790,000
# daily transit (and active) trips	1,070,000	2,190,000
# daily transit commuters (age less than 45)	710,000	1,380,000
# daily transit commuters (age 45 and older)	360,000	810,000
# of daily car commuters	3,580,000	4,610,000
# daily of car commuters (age less than 45)	1,870,000	2,280,000
# daily of car commuters (age 45 and older)	1,710,000	2,330,000

The expected increase in daily commuters by 2051 raises the issue of whether or not the planned expansion of the transportation and transit network across the GGH will have sufficient capacity to handle the increase in expected commuter volumes. If the more than doubling of the demand for transit cannot be met by transit capacity, it would be expected to overflow into car commuting, adding further congestion pressure on our roads.

Taking into consideration the current plans to expand the transportation and transit network, we expect that, taking the region as a whole, the capacity of the network will be able to just meet this demand by 2051 albeit under certain conditions. The first condition is that the governments must execute their transit and transportation plans on time, and ensure transit is integrated with other development plans. The second condition is that remote work trends remain at least at 20% for the workforce, which is three times more than pre-pandemic levels. Prior to the pandemic, only 7% of workforce in the GGH regularly worked from home, while at the peak of the pandemic this had increased to over 30%.

Both the conditions of timely execution of investments and the continuance of remote work trends need to coincide if the transportation and transit network of the GGH and its regions are going to meet commuter demand by 2051. If these conditions are not met, we estimate that the change in the capacity of the transportation and transit network will only expected to meet 84% of the change in demand. This will transpire into traffic congestion that the region has yet to experience and transit commuter overflow.

Within the municipalities and regions of the GGH, the experience of the sufficiency of the transportation and transit network varies and their future experience are also highly dependent upon timely completion of government projects and remote work trends. The differences between regions arises from the relative differences between expected population growth, employment growth, and infrastructure investments. Some regions have a larger growth (whether in population or jobs), but a smaller increase in capacity compared to others.

Table 2 Ratio of growth in capacity to growth in demand and sensitivity to remote work levels

Region (Trip Origin)	Scenario: Return to Pre-Pandemic Remote Work Rates	Scenario: Remote Work Rates at 20%
Durham	0.75	0.88
Halton	0.83	0.97
Hamilton	0.97	1.16
Niagara	0.98	1.17
Peel	1.02	1.20
Simcoe	0.82	0.96
Toronto	1.17	1.30
Waterloo	0.89	1.05
Wellington	0.95	1.12
York	0.87	1.02
GGH	**0.84**	**0.98**

Legend
< 0.85
Capacity growth is less than demand growth
0.86 to 0.99
Capacity growth slightly less than demand growth
1.00 to 1.14
Capacity growth slightly more than demand growth
1.15 or above
Capacity growth is more than demand growth

Areas such as Toronto, Peel, Hamilton, Niagara and Wellington have transportation and transit growth plans that are commensurate with expected demand growth. However, it is important to note that regions such as Toronto have many transit trips which do not originate directly in the City itself but are the final leg of a multi-step commute. In contrast, areas such as Durham, Halton and Simcoe may face more transit pressure and may be highly dependent upon the remote work trends inspired by the pandemic to modestly continue (at least 20% of the workforce). If such remote work trends continue to occur, with the exception of Durham, these regions should be able to meet daily commuter demand growth levels, though that is somewhat sensitive to the volume of transit provided in the proposed Bus Rapid Transit corridors.

Another consideration of the sufficiency of transportation and transit growth plans is the impact on younger residents and lower income households. Younger age groups are more dependent upon and more likely to use public transit. Coupled with their lower ability to work remotely (given the occupations usually held by younger age groups) and their lower incomes, transit costs are one of their most significant expenses.

In conclusion, if the planned increase in capacity occurs, the GGH's overall experience with transit and transportation should largely be maintained as the population and economy grow. However, the various municipalities in the region will experience the growth differently, and long-term policies such as immigration policy, and work-from-home trends, could significantly put the sufficiency of the network at risk. Critically, it requires that housing, transit, transportation, and economic development planning be aligned over the long term to ensure efficient use of infrastructure investment. If this occurs, the regional transit and transportation network could serve the needs of its residents well over the next 30 years.

1.0 BACKGROUND

1.1 POPULATION GROWTH IN THE GGH

The Greater Golden Horseshoe Region (GGH) is home to over two-thirds of Ontario's population and jobs. Over the past decade, the GGH population has increased by over 1.2 million people (a 13.5% increase) and the number of jobs in the region has grown by 470,000 (an 11% increase). While the growth of GGH was always expected to continue, the federal government's recent announcement to increase immigration levels into Canada by 55% relative to pre-pandemic levels will accelerate its growth.

Given the region's importance to the prosperity of Ontario, with the GGH supporting two-thirds of the GDP of Ontario and a quarter of Canada's GDP, it is critical that the region's transportation and transit infrastructure capacity keep pace with, and be aligned to, future population and economic growth requirements. Under the new immigration targets, immigration into the GGH is expected to more than double from an average of 112,000 new immigrants per year from 2009 to 2019, to almost 200,000 per year. In this case, the population of the GGH could to grow to 16.9 million residents by 2051 (a 71% increase from 2021) and support 8 million jobs (a 63% increase from to 2021) in the region.

Prior to the pandemic, more than half of commuters spend over 30 minutes commuting in a single direction, and for some commuters, this can even exceed an hour. On public transit, commutes of an hour or more are twice as common as commutes lasting under 30 minutes. The longest commutes belong to residents of municipalities in the north of the GTHA and those for whom public transit is the primary mode. Outside the major urban centres of the GTHA, fewer people use public transit due to its limited availability with the exception of long trips on the regional GO transit lines.

All type of commuting is associated with a cost, both financial and in terms of time. For lower-income households, namely, those whose incomes fall in the lowest fifth of the population, transportation and housing together make up half of their total expenses, on average. Since these households are most at risk of being priced out of a given housing market, their transportation expenses are closely tied to housing costs and these are therefore best considered together.

The rapid future growth profile of the GGH is expected to have significant implications for mobility throughout the region and place further pressure on the GGH's transit and transportation system in the coming years. In many cities and municipalities, less than half of the people who work there live there, which places a significant amount of pressure on the GGH's transportation and transit network.

To address the growing needs of the region, Ontario plans a large expansion of the transit and transportation network over the next 30 years based on pre-pandemic trends. Key aspects of the GGH transportation plan include expanding GO train service to provide 15-minute all day service across the network, expansion of subway, light rail transit, and bus rapid transit lines, and increasing highway capacity through widening existing corridors and adding new connecting highways.[1]

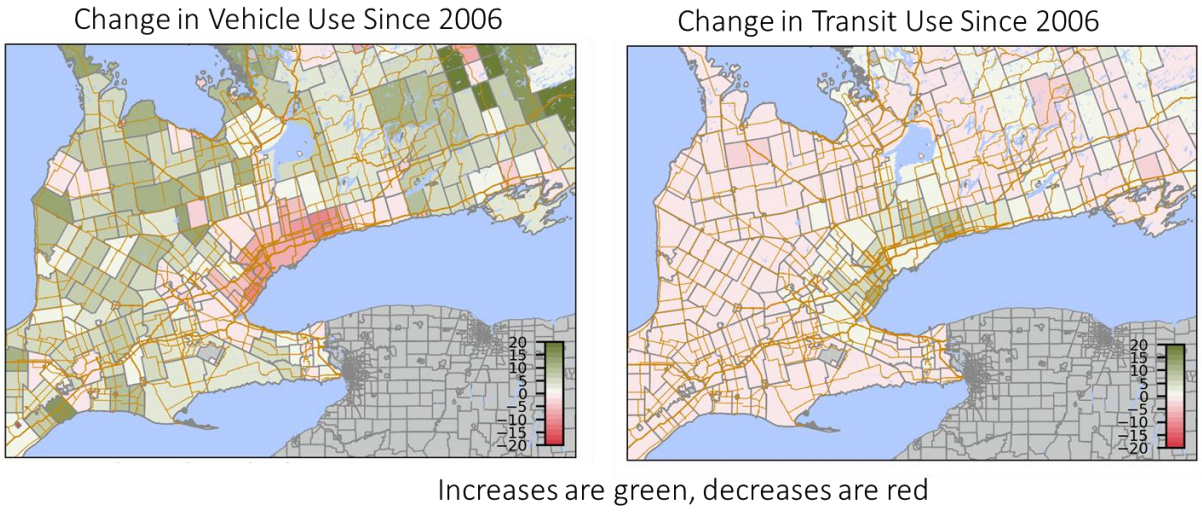
[1] Full details at: https://www.ontario.ca/page/connecting-ggh-transportation-plan-greater-golden-horseshoe

However, it is critical to understand how Ontario's transportation plan in the GGH will fare in meeting the needs of all its residents in the face of changing immigration policies and evolving workplace trends such as remote work (working from home).

1.2 Commuting growth in the GGH and Remote Work

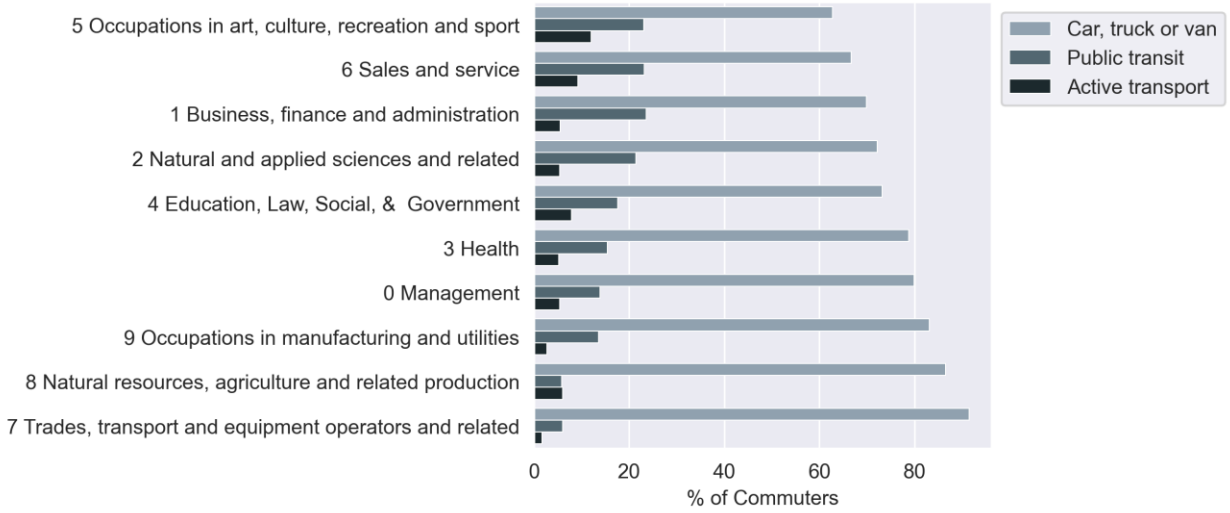
To support jobs, commuting has grown by 400,000 in the GGH from 2011 to 2019. In higher-density regions of the GGH, there has been a shift in commute mode from private vehicles to public transit. While the pandemic reduced commuting and public transit in particular, recent trends are indicating that transit use is slowly recovering (though usage patterns are evolving with broader peak periods and more weekend use).

Figure 1 Change car and vehicle use for commuting in Southern Ontario



Across the GGH, commuting mode and employment occupation are related. Employees in sales and service occupations have the highest number of people using transit, as well as the second highest percentage. Business and finance occupations also have high transit due to the concentration of jobs in downtown Toronto.

Figure 2 Trends of commuting by mode and occupation in the GGH



Prior to the pandemic, only 7% of workforce in the GGH regularly worked from home. While during the pandemic this had increased to over 30%, recent trends are indicating that many are returning to their usual place of work, at least on a part-time basis. While the 2021 census commuting data shows significant changes in commuting patterns, it is unlikely to be indicative of long-term trends of mode shifts. In particular, significant portions of the economy were not fully open during the spring of 2021 which limited the demand transit use and commuting in general. Additionally, individual vehicles were preferred to avoid proximity risks on transit, a behaviour which will likely continue to recede over the next several years.

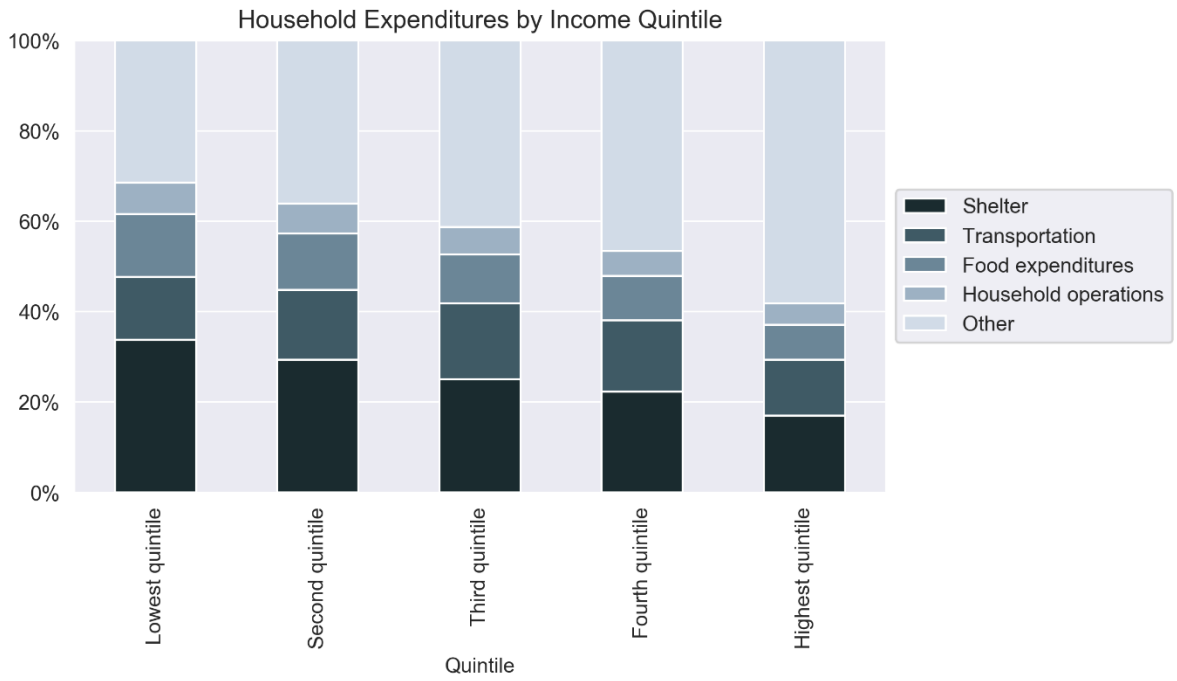
Commuter mode is also associated with the age of the commuter. Within the GGH, younger age groups are more likely to use public transit which is also related to both the occupations and incomes of the person. In addition, younger people and lower-income people are less likely to be able to take advantage of remote work given the nature of their occupations. Older commuters are the least likely to use transit due to fewer financial constraints, have a higher ability to be able to work from home, and many prefer car use.

Differences in the use patterns across age groups and occupations means that transit and transportation growth plans should take these differences into account for the variety of requirements of region's residents. Providing solutions that are only accessible to a subset of the population will hinder the region's economic development.

1.3 Transit and Affordability

While many experts focus upon the direct costs associated with housing prices as a key factor behind housing affordability, the costs associated with transit and transportation costs are equally key to understanding overall housing affordability.

Figure 3 Households expenditures by income quintile



All types of commuting are associated with a cost, both financial and in terms of time. Transportation is generally the second largest expenditure category after shelter across all income brackets. For lower-income households, namely, those whose incomes fall in the lowest fifth of the population, transportation and housing together make up half of their total expenses, on average. Since these households are most at risk of being priced out of a given housing market, their transportation expenses are closely tied to housing costs and these are therefore best considered together. For instance, a low-income family who can no longer afford to pay rent may have to move to a neighbourhood further from the wage-earners workplace with poor connections to public transit to afford rent. Their car maintenance and gas expenses will therefore increase, partially offsetting their rent savings. This also helps explain why, although lower-income households tend to rely more on public transit than higher-income households, private vehicles remain by far the main mode of transportation for households at every income level.

1.3.1 TRANSPORTATION INFRASTRUCTURE PLANS

Over the next 30 years, the population growth in the GGH is expected to accelerate. In order to have sustainable and affordable growth in the region, the number of people, the number of jobs, and the infrastructure to connect the two must all grow in sync. This raises a key issue of whether long-term transit and transportation plans are sufficient to serve the needs of the growing region.

Transportation infrastructure is necessary both to connect primarily residential municipalities to municipalities that are regional employment hubs and to facilitate transportation within municipalities to local employment hubs. Transit and transportation planning in Ontario has seen historically high levels of

investment and planned investment in transit, roads and highways, and improved rail schedules and connections within the GGH and southwestern Ontario.

There are a number of announced plans to increase transportation capacity and invest in additional transportation infrastructure in the GTHA. For instance, at the inter-municipal level, Metrolinx, the provincial transportation infrastructure agency, is preparing to accommodate a doubling of ridership over the next decades through its Regional Express Rail expansion plans. For private vehicle commuters, planned projects to increase capacity and connectivity include ongoing improvements to a number of main arteries that cross the region with expanding existing highways and the construction of new ones. At the municipal level, there are light-rail transit projects underway in Toronto, Hamilton, and Mississauga with completion dates within the next five years. This additional transportation infrastructure, however sorely needed, will only yield benefits if investments are governed by planning best practices and if their productivity is maximized. This includes the usability and affordability of the overall transit network through means such as fare and schedule integration between organizations, system-wide trip planning, and 'last-mile' connections from high-volume transit to final destinations.

Ontario's GGH transportation plan includes a range of projects for both public transit and highways. Key transit infrastructure plans (planned or in progress) include[2]:

- GO Expansion to provide two-way, all-day service every 15 minutes across the GO Transit rail network.
- Ontario Line Subway
- Eglinton Crosstown West Extension
- Yonge North Subway Extension
- Scarborough Subway Extension
- Finch West Light Rail Transit
- Hurontario Light Rail Transit (Mississauga)
- Hamilton Light Rail Transit
- Bus rapid Transit Corridors (Durham –Scarborough, Dundas).

In addition to the transit projects, key highway infrastructure projects (planned or in progress) include[2]:

- Highway 413
- Bradford Bypass
- Morriston Bypass (Guelph/Hamilton)
- Garden City Skyway (Niagara)
- Expansion of 412 through Toronto
- Widening at key points on 400, 401, 403, QEW
- Highway 404 extension

[2] Full details at: https://www.ontario.ca/page/connecting-ggh-transportation-plan-greater-golden-horseshoe

2.0 ANALYSIS AND RESULTS

2.1 MEASURING 'SUFFICIENCY'

Given the Greater Golden Horseshoe is essential to the prosperity of Ontario and Canada, it is vital that transportation infrastructure in region be able to meet future population and economic needs. To ensure sustainability we need a 'sufficient transportation network' to keep up with forecasted growth levels. Aligning current plans to those targets is critical for sustaining long-term success in the GGH.

A definition of a 'sufficient transportation network' is quite subjective depending upon who is asked based on their expectations of (1) frequency of service; (2) levels of crowding and congestion; and (3) geographic coverage. Rather than attempting to define such a threshold, an examination of the relative changes of capacity and demand over the next 30 years allows us to frame the results in terms of increases or decreases relative to the current state.

At a high level, the pressure facing Ontario's transportation network is a function of the **capacity** of the network to provide service for transit and transportation, and the **demand** for transit arising from the distribution of where people live and where people work (as travelling to and from work is the primary driver of weekday commuting) and evolving **work-from-home** trends. Taking these factors into account, it is possible to estimate the increase or decrease of demand pressure on the capacity of the transportation and transit network, and use the changing capacity-to-demand ratio as a measure of sufficiency. This ratio highlights the sensitivity of the system to population (differences which primarily arise to changes in immigration policy) and work trends (e.g. location of residence and location of work trends, remote work). For example, an increase in the capacity-to-demand ratio would indicate an improvement in the transportation infrastructure relative to the baseline (i.e. transportation is improving). Alternatively, a decrease in the capacity-to-demand ratio would indicate that transportation infrastructure is not keeping pace with population and employment growth relative to the baseline (i.e. transportation is worsening).

Specifically, no change in capacity-to-demand ratio over time means that the growth in demand is met by the growth in transportation/transit capacity. A falling capacity-to-demand ratio means that the growth in demand is not met by the growth in transportation/transit capacity. An increasing capacity-to-demand ratio means that the growth in demand is more than met by the growth in transportation/transit capacity.

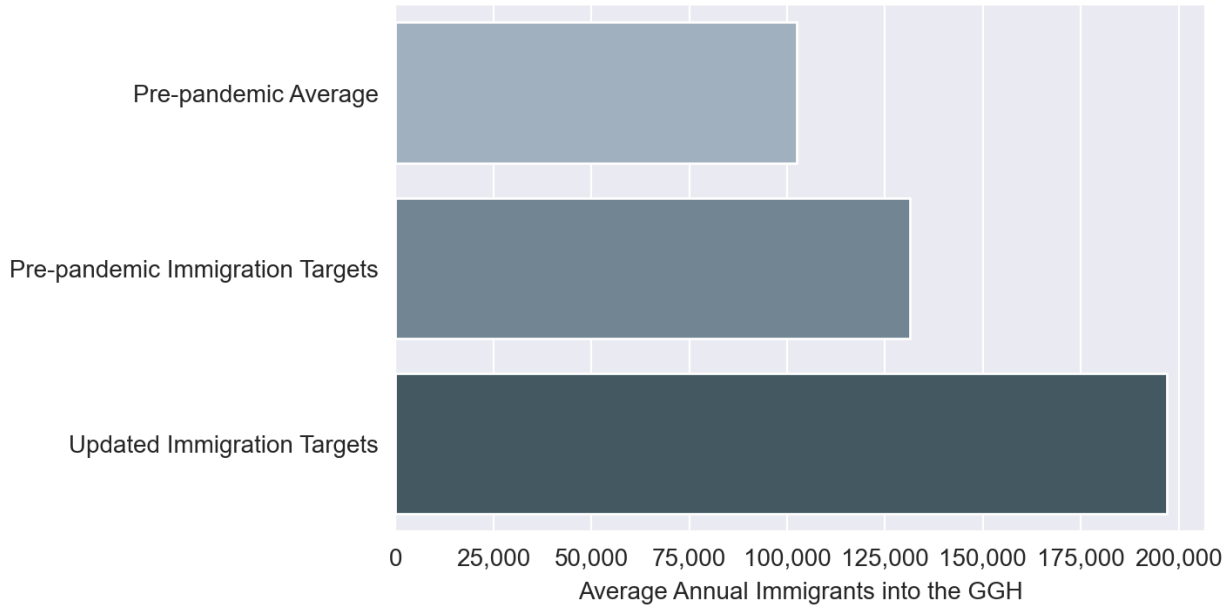
2.2 IMMIGRATION AND REMOTE WORK SCENARIOS

Given the uncertainty of future immigration trends and changes in the labour force, the sensitivity of capacity-to-demand can be investigated by the analysis of different combinations of high and low immigration growth assumptions and high and low remote work assumptions.

Prior to the pandemic, Ontario averaged 112,000 new immigrants annually with almost 88% settling within the GGH. From the Federal government's recent announcement of 500,000 new immigrants to

Canada as an annual target by 2025, up to 45% are expected to immigrate to Ontario resulting in almost 200,000 new immigrants to the GGH annually over the next several years.

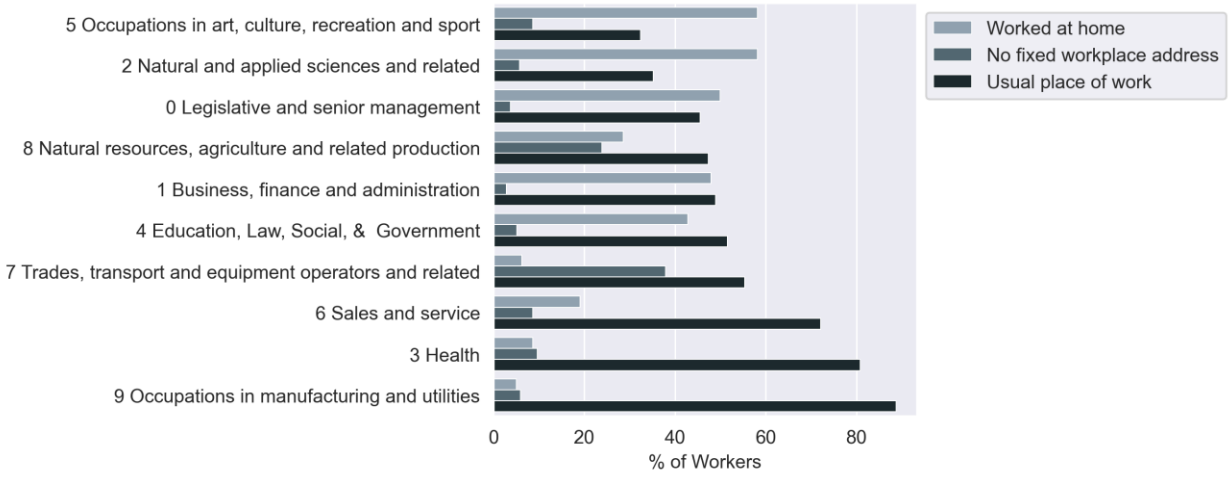
Figure 4 Historical and future immigration trends into Ontario



To test the sensitivity of capacity-to-demand to immigration growth assumptions, we consider the following, (1) Low Immigration, pre-pandemic rates continue (and increase in proportion to population); and (2) high Immigration, recently announced rates continue (and increase in proportion to population).

In terms of testing the ability to work from home, it is important to take into account the type of employment occupations that can be performed from home. Many occupations cannot be performed remotely such as healthcare, sales, trades, transport and equipment operators, and manufacturing. During 2021, only Occupations in Sciences (NOC 2) and Art & Culture (NOC 5) had over 50% working at home. Across Ontario 58% were working at a usual place of employment, while 12% had no fixed address (i.e. trades), and 30% were working at home. Since 2021, there has been a gradual return to the office.

Figure 5 Place of work by occupation



To test the sensitivity of capacity-to-demand to work-from-home, we consider the following, (1) Low remote work based upon pre-pandemic remote work rates; and (2) High remote work where 20% of employees continue working remotely (entirely, or partially), representing 66% of the pandemic rate of remote work.

2.3 Analysis of Growth and Transportation Infrastructure Sufficiency

2.3.1 Population Growth, Job Trends and Transit/Transportation Sufficiency

By 2051, the population in the GGH could reach 14.9 million under the lower growth scenario, and 16.9 million under the higher growth rate. These scenarios represent an increase of 150% and 171% relative to before the pandemic. The high immigration scenario would require an average of 26,000 additional new dwellings per annum over the next 30 years relative to current pre-pandemic targets based on the slower growth scenario. The number of jobs in the region would also increase, though not as fast as the population due to the lower participation rate of retirees as the population ages. Between 7.0 million and 8.0 million jobs are expected to be in the GGH by 2051 representing an increase of 143% and 163% relative to before the pandemic (2019).

Analysis of these scenario combinations results in a range of increase of between 1.3 to 2.9 million daily commuter trips by 2051, with the high immigration and low remote work scenario combinations yielding an additional 2.9 million daily commuter trips by 2051, an increase of 95% on pre-pandemic levels. That is, the number of daily transit trips in the region could almost double by 2051 under the high immigration and low remote work scenario and car commutes would increase by just over 50%. On the other side, with a high rate of remote work and slower population growth, the number of daily transit trips would

still increase by over 540,000 with car trips increasing by 760,000, an increase on pre-pandemic levels of 51% for daily transit trips and 21% for daily car commutes.

In terms of greenhouse gas emissions, Canada's current plan is to ban the sale of combustion engine cars by 2035, with a minimum 20% electric vehicles by 2026, and 60% by 2030. The increase in commuter volumes is unlikely to have a significant impact on GHG emissions with the electrification of GO transit and the current and planned trends for electric vehicle adoption.

Across the region overall, the increased volume due to higher immigration rates poses a significant risk to maintaining the sufficiency of the network and it would require a large uptake of remote working to help mitigate the challenges. To understand how the increased commuter volumes are impacting the sufficiency of the transit system, the ratio of capacity-to-demand for pre-pandemic can be compared to these 2051 estimates.

Generally, the current transportation infrastructure plans in Ontario mentioned above, if executed on time, would increase aggregate capacity across the transit system by 103% (more than doubling) by 2051. Yet, by then, the total demand for travel could increase by 105%. Fortunately, from a transit-demand point of view, the increased demand for services by the faster population growth is somewhat balanced by the increased preference to work remotely. If WFH rates were to return to pre-pandemic levels, the increase in demand would be 122% due to people travelling to work, which is significantly greater than the increase in capacity.

Table 3 Travel patterns in the GGH, 2019 and 2051

Statistic	2019 Prior to the Pandemic	2051 Post-Pandemic WFH, Higher Growth
# of daily commuters	4,650,000	6,790,000
# daily transit (and active) trips	1,070,000	2,190,000
# daily transit commuters (age less than 45 years)	710,000	1,380,000
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# of daily car commuters	3,580,000	4,610,000
# daily of car commuters (age less than 45 years)	1,870,000	2,280,000
# daily of car commuters (age 45 years and older)	1,710,000	2,330,000

The general trend of younger people using transit is expected to continue with over 1.3M people under 45 years old taking transit daily by 2051, being 63% of all people who commute. Older age groups drive the growth of daily car commuters (partly due to an aging population), with daily car commuters

increasing by 28.8% increasing to 2.3M daily car commuters, with a least half being aged 45 years and older.

Across the GGH, each municipality is going to experience different levels of growth and investment. While the aggregate capacity across the entire system is growing largely in line with aggregate demand, the experience across municipalities does vary, particularly when work-from-home behaviour is taken into account.

While the GGH region as a whole is expected to see an increase in aggregate capacity across the transit system (103%, more than doubling by 2051) that will meet the total demand for travel (demand increase by 105%), analysis shows that several regions will not be able to meet the demand for travel. The ability to maintain the sufficiency of the network again is dependent upon a continuing large uptake of remote working to help mitigate these regional challenges.

Table 4 Ratio of growth in capacity to growth in demand and sensitivity to WFH

Key Region (Trip Origin)	Pre-Pandemic Work From Home Rates	Post-Pandemic Work From Home Rates (20%)
Durham	0.75	0.88
Halton	0.83	0.97
Hamilton	0.97	1.16
Niagara	0.98	1.17
Peel	1.02	1.20
Simcoe	0.82	0.96
Toronto	1.17	1.30
Waterloo	0.89	1.05
Wellington	0.95	1.12
York	0.87	1.02
GGH	**0.84**	**0.98**

Legend
< 0.85
Capacity growth is less than demand growth
0.86 to 0.99
Capacity growth slightly less than demand growth
1.00 to 1.14
Capacity growth slightly more than demand growth
1.15 or above
Capacity growth is more than demand growth

Analysis by GGH regions shows significant variation in the capacity of the transportation/transit network within regions. Some regions are already well served, but experiencing rapid population growth with little in the way of expansion of transit and fewer opportunities for remote work given the occupations of residents (i.e. Durham, Halton). Other areas, such as Toronto and Peel, have slower relative growth (but still significant) and will experience improvements in transit. Yet, it should be kept in mind that both had started at historically lower levels of capacity, as well as many transit trips in Toronto have a traveller whose journey did not originate in the City.

The ability to achieve a more balanced expected experience of transportation/transit demand and its capacity, the capacity and demand must be geographically aligned which requires that housing policy and economic development are integrated with transit and transportation growth. In particular, to leverage the capacity provided by all-day two-way service in the GO network, and to improve the balance of flows in opposite direction on highways, employment growth needs to move away from the traditional downtown-Toronto centric approach, while being "last-mile" accessible from the expanded regional networks.

2.3.2 COMMUTING COSTS AND AFFORDABILITY

The regional variation of the level of service has an impact on both the time and cost of transportation. Higher demand with lower capacity would increase both factors and lessen overall affordability. Public transit is more heavily used by people from lower-income households. Ensuring sufficient transportation is critical to allowing people from lower-income households to reach work and other services. Lower-income households may require a vehicle out of necessity to travel to and from work if transit is not available or not efficient.

Ensuring that the transit and transportation network has sufficient capacity to meet demand in the future allows all ages to access the labour market and other services. As discussed previously, the availability of remote work is possible for only certain occupations, such as professional services. For other occupations, such as services, manufacturing, or health care, many of which have lower pay and are often held by younger people, remote work is not possible. The combination of these factors leads to the result that younger ages and people in many lower-income occupations tend to be higher users of transit. This has implications for commuting costs and affordability for those groups.

By 2051, it is expected that about 4.0 million people (lower growth scenario) under the age of 25 will require the means to access their employment or school (up to 4.8M under the higher growth scenario), many of which may have to commute to other regions. Unfortunately, many of these people will have little opportunity to work remotely or commute via private vehicle due to occupation and income constraints. Similarly, by 2051, it is expected that over 1.4 million lower-income households (lowest quintile) in the GGH could spend as much on transit and transportation as on food, a 94% increase from current trends.

Ensuring that the transit system is sufficient to meet the needs of young people and low income households is important to the overall well-being of the region and equitable access to economic opportunities. Programs such as fare integration, combined trip planning, and schedule alignment, can ease the travel between systems and across regions would enhance the efficiency and affordability of the system.

3.0 CONCLUSIONS

The GGH has experienced rapid population growth between 2009 and 2019 and is about to embark upon an accelerated number of new residents in a historically significant way given the federal government's announcement to substantially increase immigration rates. Both the planned population growth and now the accelerated expected population growth is expected to double the demand for transportation and transit by 2051.

If the planned increase in transportation network capacity occurs, the GGH's overall experience with transit and transportation should largely be maintained as the population and economy grow. This conclusion is however dependent upon two conditions being met simultaneously. The first is that the government will execute its infrastructure plans on time. The second is that remote work remains at 20% of the workforce, which is three times more than pre-pandemic levels. If neither of these conditions is met, then the capacity of the transportation and transit network is not expected to meet future demand.

Within the municipalities and regions of the GGH, the experience of the sufficiency of the transportation and transit network varies. Areas such as Toronto, Peel, Hamilton, Niagara and Wellington have transportation and transit growth plans that are commensurate with expected demand growth. However, areas such as Durham, Halton, Simcoe, Waterloo and York do not and will be dependent upon the remote work trends inspired by the pandemic to modestly continue. If such remote work trends continue to occur, with the exception of Durham, these regions should be able to meet daily commuter demand growth levels.

With the various municipalities in the region experiencing growth differently, coupled with long-term policies such as immigration policy, and work-from-home trends, the sufficiency of the network is significantly at risk. These risks will be felt across all residents of the GGH, however, the impact on younger residents and lower-income households is expected to be greater.

Critically, the mitigation of the risks to the sufficiency of the GGH's transportation network requires that housing, transit, transportation, and economic development planning be aligned over the long term to ensure efficient use of infrastructure investment. If this occurs, the regional transit and transportation network could serve the needs of its residents well over the next 30 years.