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Growth Patterns in the GTHA

As the leading region for job creation in Ontario over the past decade and home to over half of the provincial population, the GTHA's prosperity is closely linked to that of Canada. At the heart of the region is the Toronto metropolitan area, which alone generates 52% of Ontario's GDP.



Figure 1. Average Commuting Times by Place of Residence (top) and percentage of labour force living and working in the same region (bottom), 2016

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Between 2006 and 2016, the population in the region has grown by 14% and the number of jobs has grown by almost 10%. By 2041, the population is expected to grow by a further 41% to over 10.1 million.

Longer commutes are a consequence of the geographical divide between home and workplace found in the region. The majority of employees in



Figure 2. Change in private vehicle use (top) and public transit (bottom) as primary mode, 2006 to 2016

six of the nine municipalities with the largest number of jobs commute in from other municipalities. Only in Toronto, Hamilton and Mississauga do over 50% of the locally employed population also reside within the same municipal boundaries.

People who reside in the larger urban centres of the GTHA, and Toronto most notably, generally have public transit options that connect their places of residence and work. Outside of these urban cores, car ownership is a necessity. Thus, while the prevalence of public transit has increased as the main mode of commute for people residing in GTHA, the share of private vehicle commutes has increased in the rest of the region.

Present Transportation Challenges

Currently, more than half of commuters spend over 30 minutes commuting in a single direction, and for some commuters, this can even exceed an hour. This exceeds the commonly cited "Marchetti's Constant," the notion in transportation literature that on average, people are willing to commute for 30 minutes in a single direction, and hints at the pressure building up in the system. The longest commutes belong to residents of municipalities in the north of the GTHA and those for whom public transit is the primary mode, as shown in the figure below. (Note that outside the major urban centres of the GTHA, fewer people use public transit due to its limited availability with the exception of longer trips on the regional GO transit lines).

In fact, on public transit, commutes of an hour or more are twice as common as commutes lasting under 30 minutes. Public transit takes longer per kilometre than private vehicles, and it is likely because of this higher time cost that many people

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for whom public transit may be available and less expensive than owning a vehicle still choose to drive to work.



Average Commute Time: Public Transit



Figure 3. Average commute duration by vehicle (top) and by public transit (bottom)

All types of commuting are 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, transpor-

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tation 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 earner's 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.



Figure 4. Household expenditures by income quintile in the Toronto CMA, 2016

Congestion, which is caused by commuter flows in the region, imposes significant societal costs and poses a risk to regional prosperity. Past the point of capacity, every commuter's use of transportation infrastructure (whether roads, trains, subways, etc.) imposes a cost on the entire system in the form of congestion, which generally includes

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longer trip times, slower speeds and increased queuing. The cost to drivers is an estimated additional 840,000 hours on the road each day, with an associated economic cost of \$4.9 billion annually in the GTA alone. Beyond the direct costs borne by all commuters on the overloaded system, excessive congestion can also negatively impact the labour market and economic growth. For instance, businesses that face a higher cost of doing business as a result of congestion could be discouraged from investing and growing their operations and may even relocate. Workers facing a declining quality of life as a result of long, gridlocked commutes may also choose to leave the area, and this may also discourage people from searching for work in the region if economic conditions are comparable elsewhere. These obstacles to investment and labour force mobility, if persistent, could have a long-term impact on the GTHA's prosperity.

Future Opportunities for Transportation in the GTHA

At the rate that employment and population are growing, daily commuting trips to the GTHA are expected to increase by 480,000 by 2030. To accommodate this growth, the capacity of both major roadways and public transit will have to increase significantly in order to avoid system overload. The figure below shows how much additional road and public transit capacity will be required as the number of commuters increases (e.g., if half of new commuters travel in private vehicles and the other half on public transit, road capacity will have to increase by less than 10% while public transit capacity will have to increase by over 20%). Evident in the figure is that public transit capacity will have to increase faster than road capacity to accommodate new commuters. Given the significant costs associated with creating new transportation infrastructure or expanding and increasing the capacity of existing infrastructure, ensuring the productivity of these investments (i.e., maximizing the capacity per dollar invested) is critical.





The existing geographical disparity between where most people live and most people work in the GTHA points to the need to harmonize transportation planning with land-use planning and economic policy. Transportation-oriented development (TOD) is a concept that fits this purpose. TOD maximizes the number of homes, businesses and other activities in proximity to transit development, creating economies of scale and rendering transportation infrastructure investments more productive. As the GTHA continues to grow, TOD can play a role in minimizing unused capacity on public transit.

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. There are a number of publicly announced plans to increase transportation capacity and invest in additional transpor-

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tation 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 one to two decades by implementing the Regional Express Rail expansion. For private vehicle commuters, planned projects to increase capacity and connectivity include ongoing improvements to a number of main arteries that cross the region and the expansion of Highway 407 to the east with connections to Highway 401. At the intra-municipal level, there are light-rail transit projects underway in Toronto 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.

Emerging trends in transportation also have the potential to impact the system. One such example is the rise of "vehicle-on-demand" (VOD) services in the last decade, which in addition to taxicabs, includes technology-driven platforms such as Uber and Lyft. These have already begun to change how infrastructure is used. There is increasing evidence that VOD services actually increase the number of cars on the road, in part by reducing the number of cars sitting idle in garages and driveways. Studies have shown that their impact on public transit ridership in American cities is mixed. Cities and towns with small, less extensive public transit systems tend to see a decline in ridership following the expansion of VOD services in the area, which suggests that these offer a competing service. On the other hand, cities with larger, more extensive public transit systems have seen a small increase in transit use following their introduction, which

suggests some degree of complementarity. It will be important to continue to monitor these trends and assess their relevance to the GTHA context as they develop and to consider the possible impacts of VOD services when planning future regional transportation infrastructure. Autonomous Vehicles (AV) are another emerging trend whose future impacts will become clearer as the technology matures. Nonetheless, decision-makers and planners should begin contemplating a range of adoption scenarios and modelling how each could affect commuter flows in the GTHA and change congestion patterns.

Key Takeaways

- The continued population and employment growth in the GTHA can exacerbate current transportation challenges.
- Without sufficient, properly leveraged and wellplanned transportation infrastructure:
 - Commutes could continue to lengthen and quality of life could suffer.
 - Average commute times could increase, pushing people to look elsewhere for employment opportunities.
 - Costs of doing business may increase and the ability to attract employees could decrease, constraining regional economic growth.
- To avoid a worsening of congestion and to lessen transportation pressures, future investments in transportation infrastructure should be evaluated on the basis of their productivity to make sure every dollar invested goes to a project that will generate capacity where it is most needed.
- The alignment of residential, economic and transportation development is critical to Ontario's prosperity and future growth.

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