Effective Transportation as the Key to Sustainable Cities in the GTHA

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EXECUTIVE SUMMARY

This white paper explores the development of a sustainable transportation ecosystem for the Greater Toronto and Hamilton Area (GTHA). It highlights the crucial role of efficient transportation systems in enhancing quality of life, cutting greenhouse gas (GHG) emissions, fostering economic growth, and promoting social equity. By examining global case studies, the paper demonstrates how a well-designed, integrated transportation network can effectively address the GTHA's pressing challenges, including low public transit use, car dependency, traffic congestion, and inadequate infrastructure.

Conclusion

Effective, integrated transportation is key to creating sustainable, livable, and economically vibrant cities in the GTHA, with potential for improvement by learning from successful global models.

Recommendations

- **Prioritise Funding**: Invest in critical transportation projects, including subway expansions, light rail transit **(LRT)**, and high-frequency **Bus Rapid Transit (BRT)** services.
- **Public Transit User Experience:** Improve public transit reliability, safety, and user satisfaction by implementing real-time information systems, cleaner stations, and active security measures.
- **Sustainable Development:** Promote **transit-oriented development (TOD)** that integrates urban planning with public transportation to encourage car-free living.
- **Active Transportation:** Enhance walking and cycling infrastructure by developing protected bike lanes and expanding bike-sharing programs. Prioritise these improvements in low-density micro-neighbourhoods where residents can seamlessly live, work, and play, while also implementing them in other strategic areas where they will have the greatest impact.
- **First-Mile/Last-Mile Solutions:** Introduce **on-demand transit (ODT)**, ridesharing, and bike-sharing programs to bridge gaps between public transport stations and homes.
- **Climate Friendly Energy for Transit Systems:** Electrify the entire transit system, including the GO rail network, to reduce emissions and operational costs, improve travel times, increase capacity, and promote climate-friendly, sustainable transportation with closer station spacing for greater efficiency.
- **Digital Integration:** Leverage big data analytics and real-time demand prediction to optimize routes, schedules, and resource allocation across transit services.
- **Innovative Funding:** Explore new revenue models, such as real estate development near transit hubs and infrastructure-based taxes, to sustain long-term transportation projects.

These strategies aim to create a climate-friendly, economically sustainable, and inclusive transportation ecosystem in the GTHA, where all residents can efficiently move around using public transit.

OBJECTIVE

Transportation plays a crucial role in shaping the future of sustainable cities. Effective transportation systems are not only essential for reducing GHG emissions and air pollution but also for enhancing the quality of life, economic opportunities, and social equity (Shiftan et al., 2003; Song et al., 2013; Steg & Gifford, 2005). This white paper explores how an integrated and efficient transportation ecosystem can transform the GTHA into a model of sustainability and urban livability. By examining successful examples from global cities like Hong Kong, Paris, Helsinki, Copenhagen, Singapore, and Amsterdam, this paper offers recommendations for the GTHA to overcome its current transportation challenges, funding for key projects, and create an environment where all residents, including the affluent, choose public transit over personal vehicles.

INTRODUCTION

The rapid urbanization of the GTHA presents both opportunities and challenges. As the region continues to grow, it is crucial to develop a sustainable transportation system that supports economic vitality, environmental health, and social inclusivity. Transportation is often referred to as the backbone that keeps cities functioning smoothly, enabling residents to access jobs, education, healthcare, and other essential services. However, in the GTHA, challenges such as low public transit ridership due to safety concerns, lack of reliability, and failure to meet customer satisfaction, combined with traffic congestion, inadequate infrastructure, and limited coverage, hinder the effectiveness of the transportation system and its ability to support a sustainable and thriving urban environment. This white paper argues that addressing these issues through a comprehensive transportation strategy is key to creating a sustainable and high-quality urban environment in the GTHA.

THE ROLE OF TRANSPORTATION IN SUSTAINABLE CITIES

Quality of Life

Effective transportation systems are fundamental to improving the quality of life in urban areas (Litman, 2017; Othman & Ali, 2020). In the GTHA, well-planned transportation can lead to better standards of living by ensuring that residents have access to affordable housing, employment opportunities, and essential services. When people can move efficiently and affordably within a city, it reduces stress, saves time, money, and enhances overall well-being.

Environmental Benefits

Transportation is one of the major contributor to GHG emissions and air pollution (Domke et al., 2022). By shifting from car-dependent travel to more sustainable modes such as public transit, and active transportation modes, the GTHA can significantly reduce its environmental footprint. A well-integrated transportation network can help achieve climate goals by lowering emissions, reducing energy consumption, and minimizing the impact on natural resources.

Circular Economy

Transportation systems can also support the development of a circular economy by promoting resource efficiency and reducing waste (De Abreu et al., 2022). In 2021 (Statistics Canada, 2023), nearly 74% of Toronto census metropolitan area (CMA) workers commuted by car, with 85% driving alone. Average commute times were 25.5 minutes by car, 47.6 minutes by public transit, and 15.6

minutes by walking or cycling. Transit users faced longer commutes, with 40% of trips lasting 60 minutes or more. Commuters from neighbouring areas like Oshawa, Hamilton, Barrie, and Guelph were heavily car-dependent, often driving alone, and those using public transit typically experienced significantly longer travel times compared to those driving. A large majority of workers commuting southbound to Toronto from Barrie (97.0%) and eastbound from Guelph (96.0%) traveled by car, with over 90% of these vehicles carrying just one person—the driver. It is worth mentioning that the monthly cost of owning a vehicle in Toronto has risen to $1,623, up from $1,068 per month in 2019 (Gauthier, 2024). In comparison, the average cost across Canada is $1,300 per month (Casemore, 2024). Despite these expenses, vehicles remain parked 95% of the time. Many residents are compelled to rely on personal vehicles for their work-home commute due to the absence of a seamless, efficient, reliable, and safe means of transportation. Integrating shared mobility options, such as ridesharing and bike sharing, can help optimize transportation systems, reduce reliance on personal vehicles, and support the development of a circular economy by promoting resource efficiency and reducing waste (Machado et al., 2018).

CREATING A SUPPORTIVE ECOSYSTEM FOR SUSTAINABLE TRANSPORTATION

Urban Planning Integration

Integrating transportation infrastructure with urban planning is essential to creating a sustainable transportation ecology, especially in high-density developments and new housing projects. By ensuring that residential and commercial areas are well-connected to public transportation, this strategy makes it simpler for individuals to select environmentally friendly means of transportation over private automobiles.

The significance of Transit Oriented Communities—where significant efforts are being made to boost the amount of new housing units—was recently discussed in an **Association of Municipalities of Ontario** meeting. The province's commitment to this program aligns with the broader goal of meeting housing targets while enhancing public transit connectivity.

In a recent speech to conference delegates, the Minister of Municipal Affairs and Housing, **Hon. Paul Calandra** recognized significant progress in surpassing housing pledge commitments in Oakville, showcasing how effective urban planning can integrate transit options within both greenfield areas and new high-rise development. An example of this is the Hurontario Light Rail Transit (LRT), where routes are being strategically planned to serve new high-rise developments, demonstrating the potential of integrated planning to support sustainable urban growth.

Active Transportation and Public Transit User Satisfaction

There is a strong correlation between active transportation (walking, cycling, and other human-powered modes), public transit user satisfaction, and increased ridership. Encouraging walking and cycling, along with reliable and efficient public transit, can boost transit use, reduce congestion, and promote a healthier population. Public transit systems should be designed to cater to the needs of all users, providing safe, convenient, and accessible options that enhance user satisfaction. Enhancing passengers' satisfaction with various service attributes is crucial for boosting the overall appeal of public transit. This, in turn, can lead to increased patronage by encouraging more frequent use and fostering long-term loyalty. Gaining insights into the factors influencing transit users' satisfaction is essential, as it helps predict their likelihood of continued service use, increased expenditure, and willingness to recommend the service to others (Dixon et al., 2010; Van Lierop & El-Geneidy, 2016). To enhance public transit systems and foster greater user satisfaction, transit agencies should several

critical improvement strategies. These include elevating service quality by incorporating rail-like features into bus services, focusing on reliability rather than merely increasing service frequency, and ensuring high standards of safety through careful vehicle operation and robust security measures. Improving users' perception of safety can be achieved by increasing the presence of police, installing surveillance cameras, and enhancing overall service reliability.

Additionally, providing accessible, accurate on-board information and maintaining high levels of cleanliness, especially in rail stations, are crucial for improving overall user satisfaction. By addressing these aspects, transit agencies can significantly boost user loyalty, encourage more frequent use, and ultimately strengthen the appeal of public transit systems. Understanding and implementing these strategies is essential for predicting continued service use, increased expenditure, and positive recommendations from users (Chakrabarti & Giuliano, 2015; Diab & El-Geneidy, 2014; Van Lierop & El-Geneidy, 2016; Yavuz & Welch, 2010).

Another method to increase public transit ridership is through active transportation, especially a bike share program. As of April 2021, approximately 1,993 cities globally had implemented bike share programs, collectively utilizing over 9,387,903 bicycles. Additionally, around 291 other cities were in the process of planning or developing similar bike share initiatives (Godavarthy et al., 2022; Meddin et al., 2020).

The GTHA faces several challenges in urban mobility, including high car ownership rates and limited walking and cycling infrastructure. In congested cities like Toronto, land is limited, thereby we cannot accommodate transit, cars, buses, bicycles, and sidewalks all at the same time, but we can prioritise cyclists and pedestrians where applicable and make sure we can accommodate connecting them to public transit system. The **Bloor Street Bike Lane Pilot Project**, approved by **Toronto City Council** in May 2016, involved installing separated bike lanes on Bloor Street West from Shaw Street to Avenue Road. The project aimed to assess the impact of bike lanes, with results presented to the **Public Works and Infrastructure Committee** and **Toronto City Council** in late 2017. Key outcomes included a 56% increase in cycling, a 44% reduction in conflicts, and positive economic impacts, such as higher customer spending (Smith Lea et al., 2017). A 2016 research study found that around 4.35 million trips within the GTHA could feasibly be made by bicycle, representing about one-third (33%) of all trips that are not currently taken on foot or by bike. Among these potentially cyclable trips, more than half (53%) are relatively short, spanning distances of 1 to 3 km (Mitra et al., 2016). Neighbourhoods with a higher percentage of short trips (below 4 km) and trips between 4-8 km are more likely to have a higher cycling mode share. This suggests that short trips currently not made by bicycle present an opportunity to increase cycling as a mode of transportation (Assunçao-Denis & Tomalty, 2019). Several studies indicate that bike sharing is generally linked to public transit ridership, though the nature of this relationship is not fully understood (Campbell & Brakewood, 2017; Martin & Shaheen, 2014; Saberi et al., 2018; Zhang & Zhang, 2018).

Bike sharing can either substitute public transit, potentially decreasing ridership, or complement it, particularly by addressing the first-mile/last-mile issue, thereby increasing ridership. Alternatively, bike sharing might be used for recreation, with no effect on transit usage. The interaction between bike sharing and public transit can vary depending on the user or context. According to a study which examining the relations between the frequency of public transit usage and the probability and frequency of bike sharing usage in the United States using data from the **2017 National Household Travel Survey**, researchers found that increased public transit usage leads to more frequent use of bike sharing. Specifically, a rise in public transit use boosts bike sharing usage by 1.4% for first-mile/last-mile trips and 4.0% overall. This suggests that bike sharing effectively connects public transit stations with destinations.

The positive link between bike sharing and public transit is stronger in areas with high population density and rail service. This means bike sharing and public transit can work well together, especially in more urbanized areas (Zhang & Zhang, 2018). To maximize the benefits, it's important to integrate these transport modes effectively in planning and policy.

Removing Barriers to Public Transit Use

One of the key challenges in the GTHA is the reliance on personal vehicles. To shift people towards public transit, it is necessary to remove barriers by offering first-mile/last-mile solutions such as ride hailing, ridesharing, and access to floating shared bikes and e-scooters. These services can make public transit more accessible and convenient, particularly for those who live in areas with limited transit coverage.

Innisfil, Ontario implemented a subsidy program for **Uber** and taxis, believing it would be more cost-effective than running traditional bus services. This partnership between Innisfil and **Uber** greatly improved mobility options for residents and encouraged the use of ridesharing. The introduction of fixed-fare destinations further increased the number of subsidized ridehailing trips (Benaroya et al., 2023).

In October 2021, Fort Erie, Ontario, underwent a significant transformation by replacing its fixed-route system, which consisted of four buses, with an on-demand service. This new system utilized a fleet of four standard minivans and two handicap-accessible minivans instead of the previous four gasoline buses. In addition to making it possible to carry more passengers, the switch to on-demand services resulted in significant fuel savings that cut carbon dioxide emissions each ride by more than 60%. This transformation has made public transit more accessible and affordable for all residents of Fort Erie. Interviews with town employees and preliminary survey results indicate a high level of customer satisfaction, with over 90% of respondents reporting that their trips were satisfactory (Powell et al., 2023). This increase in customer satisfaction is also reflected in a notable rise in ridership.

Another approach is connecting people to transit stations via app-based On-Demand Transit (ODT) services like **Uber** and **Lyft**. People may choose to use this type of service because it is reliable, predictable, and flexible. However, in a report, (Weinreich et al., 2020) analyzed the effectiveness of transportation network companies like **Uber** and **Lyft** when used as public transportation in providing first-mile/last-mile service connecting users to transit services. They found that people are not comfortable booking their ODT service and transit service on different apps. Additionally, when the ODT service lacks a fixed stop, has an uncoordinated schedule, and offers transfers without discounts, it creates uncertainty for riders. They were unsure whether they would make their train, where they should wait for their ODT service, and are required to pay the full cost for both. This illustrates that transportation network companies have been unable to gain the trust of riders. Moreover, when these first-mile/last-mile ODT services are provided by a different agency or a private company, they are more likely to deliver unsatisfactory outcomes.

Mobility-as-a-Service (MaaS) integrates mobility services to reduce vehicle ownership by solving first mile/last mile, lower carbon emissions, ease congestion, and scale back parking in favour of more public space. Combining public transport, car sharing, bike sharing, mopeds, electric scooters, and taxis in a single platform from booking to paying can save money and time for the user. One of the best advantages of MaaS is reduced traffic congestion and excess driving. MaaS is crucial for the future of transportation as it can make transportation available anywhere and anytime. It is also capable of efficiently routing vehicles and determining fleet size and composition (Alonso-Mora et al., 2017; Wallar,

Alonso-Mora, et al., 2019; Wallar, Schwarting, et al., 2019). The GTHA lacks a dedicated app that would seamlessly integrate its multimodal public transit system.

In Markham, first-mile ODT study was conducted and aimed to supplement the current GO Transit commuter train system. The analysis involved assessing various operational scenarios using different types of on-demand solutions and their potential to replace car-based trips to four GO train stations in Markham. They also considered aspects like vehicle capacity and fleet size in their scenarios. The wait time, travel time, demand served, cost, and environmental impact were assessed during morning peak hours. The results of their evaluation showed that three cases utilizing vans provided the most favourable outcomes. Also, the van-based scenario that used 75% of the optimal fleet size and had a low detour factor emerged as particularly suitable for the case study. This scenario was projected to result in a 7% monthly cost saving for passengers compared to using a private car and paying for parking fees. Additionally, this scenario contributed to a 30% reduction in greenhouse gas emissions compared to the current mode of personal vehicle-based trips (Bürstlein et al., 2021).

HIGH-QUALITY PUBLIC TRANSIT FOR ALL

A truly sustainable and equitable city is one where all residents, regardless of income, choose public transit as their preferred way to travel. To achieve this, we need a transit system that is not just efficient and reliable, but also comfortable, safe, and convenient. By making public transit appealing even to the wealthiest residents, the GTHA can lead the way in inclusivity and sustainability.

This vision can be brought to life by offering discounted or free transit passes for students, seniors, and low-income residents, making public transit accessible to everyone. Seamless connections between buses, trains, and bike sharing systems would allow for easy, uninterrupted journeys. In addition, well-maintained, clean infrastructure, real-time tracking apps, frequent services, and comfortable waiting areas, especially in cold and hot weather all play a vital role in improving the transit experience.

The GTHA can also promote transit use by creating communities where housing, jobs, and amenities are close to transit hubs—this is known as transit-oriented development. Higher parking fees or congestion charges for driving in urban areas can encourage more people to leave their cars at home. Lastly, public awareness campaigns, loyalty programs, and reward systems can motivate residents to embrace public transportation as a regular part of their lives, fostering a strong culture of transit use across all income levels.

Case Studies and Comparative Analysis

The **Urban Mobility Readiness Index (UMRI)**, developed by the **Oliver Wyman Forum** in partnership with the **University of California at Berkeley**, is an innovative annual ranking that assesses how well global cities are prepared to lead the future of mobility. The data and findings from the UMRI have provided a solid foundation for understanding the current state of urban mobility and the key factors driving its evolution. The information extracted from this report has been instrumental in analyzing and evaluating the preparedness of various global cities to lead the future of mobility, with a focus on their public transit systems, cycling infrastructure, and sustainable urban planning initiatives (Oliver Wyman Forum, 2023).

Singapore

Singapore's public transit system is offering a variety of transportation options, reasonable fares, quick travel times, and stations conveniently located within walking distance for most residents. This

robust network earns Singapore the third spot in the **Public Transit Sub-Index**. The city-state plans to enhance station accessibility by expanding its rail network, aiming to have 80% of households within a 10-minute walk of a station by 2030 as part of its "**45-minute city**" initiative. With a relatively low car ownership rate and advanced traffic management, Singapore experiences minimal congestion. The low car ownership is partly due to the $76,000 license required to purchase a vehicle.

Hong Kong

For the second consecutive year, Hong Kong ranks first in the public transit sub-index, owing to its efficient, affordable, and accessible transit system. Public transit accounts for 71% of all distance traveled in the city, highlighting the effectiveness of its dense and well-connected network. Ongoing investments, like the new station linking the eastern and western New Territories, further strengthen the system.

Hong Kong's **Mass Transit Railway Corporation (MTRC)** stands out as one of the few profitable public transit systems globally, thanks to a model that combines transit operations with real estate development. The MTRC develops and manages properties around its stations, generating substantial revenue that supports its transit operations (Aveline-Dubach & Blandeau, 2019). This approach could be adapted to the GTHA, where **Transit-Oriented Development (TOD)** could provide new revenue streams and alleviate the financial pressure on public funds.

Helsinki, Paris, Copenhagen, Amsterdam

Cities like Helsinki, Paris, Copenhagen, and Amsterdam are renowned for their successful public transit and active transportation networks. Helsinki, in particular, tops the **Urban Mobility Readiness Index**, showcasing the value of a holistic approach to urban transport. Contributing factors to Helsinki's success include extensive car-free zones, substantial investments in EV charging infrastructure, advanced cycling infrastructure, and an expanding public transit network with affordable fares. The city's public transit system is both comprehensive and cost-effective, with a $3 ticket granting access to multiple modes of transport. Additionally, 94% of residents in the Helsinki/Vantaa area live within 300 meters of a protected bikeway.

Paris has made significant investments in expanding its subway and bus systems, while Copenhagen and Amsterdam have emerged as global leaders in cycling infrastructure. Amsterdam's urban mobility strategy s cycling and active transportation, with over a quarter of all trips currently made by bike. The city aims to increase this figure to 35% by 2030, highlighting the advantages of investing in dense cycling infrastructure and establishing car-free zones.

Copenhagen stands out as a leader in sustainable mobility, featuring dedicated car-free zones and extensive cycling infrastructure that encourage residents to choose bikes over cars. In 2022, the city introduced five new "**Cycle Superhighways**" — routes that allow cyclists to commute across municipal borders, covering a total of 25 km. This emphasis on active mobility has contributed to reducing light and noise pollution and improving air quality. Copenhagen also boasts one of the world's most robust multimodal public transit systems, known for its affordable fares and extensive operating hours. These factors place Copenhagen among the top five in the sustainability and public transit sub-indices. Additionally, a new light rail system serving the greater metro area, with trains running every five minutes in each direction during daytime hours, is set to open in 2025.

These cities demonstrate the benefits of prioritising public and active transportation, resulting in reduced congestion, lower emissions, and improved quality of life. The GTHA can learn from these

examples by implementing similar strategies to enhance its transportation network.

Comparing with the GTHA

While the GTHA has made some progress in expanding its transit network, it is still behind these global cities in terms of coverage, efficiency, and user satisfaction. By adopting best practices from Singapore, Hong Kong, Helsinki, Paris, Copenhagen, and Amsterdam, the GTHA can overcome its current challenges and build a transportation system that meets the needs of its growing population.

ADDRESSING FUNDING AND OPERATIONAL CHALLENGES

Funding Priorities & Revenue Generation

To improve the GTHA's transportation network, it is essential to funding for the most impactful projects. Mega transit projects, such as new subway lines and regional express rail, should be the focus of public investment. At the same time, existing transit services must be improved to enhance reliability and user satisfaction.

The GTHA can explore innovative funding models to support transportation projects. One option is to dedicate the entire gas tax to transportation infrastructure, providing a stable source of funding. Additionally, real estate development around transit hubs can generate significant revenue, as demonstrated by Hong Kong's MTRC model (Aveline-Dubach & Blandeau, 2019). Another potential way to fund public transit is through taxes and fees based on "ground rent theory." This idea, first proposed by **John Stuart Mill**, suggests taxing landlords who benefit from rising property values due to urban development (Mill, 2024). Popularized by **Henri George** in the United States, his approach, called "**Land Value Capture Mechanisms**" is used in cities like Los Angeles, where taxes are applied to properties near new transit lines (Stopher, 1993). A similar method could be used in the GTHA to help fund transit projects.

Cost Reduction and Technological Integration

Reducing operational costs is critical for the financial sustainability of public transit. By leveraging technology, such as **Automated Fare Collection (AFC)**, real-time data analytics, and predictive maintenance, transit agencies can operate more efficiently and provide better service to passengers.

Another approach to reducing operational costs and shortening travel time is by electrifying our GO rail system. Electrified trains offer a significant advantage in acceleration and deceleration compared to traditional diesel-powered trains. The instant torque provided by electric motors allows these trains to reach optimal speeds much faster, which is particularly beneficial for routes with frequent stops.

Additionally, electric trains can decelerate more efficiently through regenerative braking systems, which not only slows the train more quickly but also recaptures energy that can be reused. This ability to speed up and slow down rapidly without sacrificing efficiency or energy consumption drastically reduces overall travel time, making rail travel more competitive with other forms of transportation. Consequently, electrification can lead to increased passenger throughput and more cost-effective operations over the long term.

The GTHA can effectively use digital transformation and data analytics to use active transportation, especially public transit (rail, LRT, BRT, buses) to become far more efficient.

With digital transformation taking place in the GTHA, we can collect raw data through digital means. This can be anonymized, analyzed in real-time and not only can be used by an integrated transportation body and share insights to users (passengers) who can use it in real-time to plan their commute schedules. They will be able to travel seamlessly, with minimal wait times/delays, reliably in a cost-effective way and in a relaxed manner.

Provinces, cities, investors, project managers can make data informed decisions which helps cut through red tape and sluggishness, plan optimized routes, mobile resources efficiently and utilize assets optimally. It results in reducing costs, reducing project lead times and ensure satisfied transit users.

Real-Time Demand Prediction

To ensure that public transit meets the needs of passengers, it is vital to deploy adaptive strategies that respond to changes in demand or supply. Real-time demand prediction using one-step ahead prediction can help transit agencies manage passenger flow, optimize service levels, and prevent service deterioration. In addition to all available means of estimating and predicting attendance, the utilization of Automated Fare Collection (AFC) technologies has enabled more advanced analysis of transit ridership (Santanam et al., 2021). Based on this, we can optimize our transit frequencies to reduce wait times and control crowds during the trip. (Karnberger & Antoniou, 2020) examined the public transportation system in Munich by using a automated passenger counting sensors. They constructed a gradient-boosted random forest prediction system for ridership between linked stations in part of Munich by looking at weekly system averages. Another study focused on multiscale radial basis function network for predicting the irregular fluctuation of subway passenger flows at three large Beijing train stations. The model predicted riders at a station 30 minutes in the future using a one-step ahead model. Their results for three empirical studies showed that their proposed algorithm could effectively predict the emergence of ridership bursts (Li et al., 2017).

Recommendations for the GTHA

The GTHA should adopt a comprehensive policy framework that integrates transportation planning with urban development. Prioritising transit-oriented development, this approach would ensure that new projects are well-connected to public transit, while promoting sustainable modes of transportation.

To achieve long-term success, it is vital to engage the community—residents, businesses, and other stakeholders—fostering support for public transit and encouraging a shift away from personal vehicle use. Additionally, the GTHA should explore innovative funding models such as land value capture mechanisms. These strategies can help alleviate the financial burden on public funds, accelerating the development of critical transit infrastructure for future.

CONCLUSION

- Transportation is the key to creating a sustainable, high-quality urban environment. By learning from successful global cities, prioritising funding for critical projects, and adopting innovative strategies, the GTHA can build a transportation system that supports economic growth, environmental sustainability, and social equity. The future of the GTHA depends on its ability to transform its transportation network into a model of efficiency, accessibility, and inclusivity.
- Efficient, integrated transportation systems improve urban living, reduce stress, and provide

better access to essential services. They also lower GHG emissions, shift societal behavior from car dependency to public transit use, and support a circular economy through optimized resource use.

- Effective urban planning and robust transit infrastructure enhance sustainability. This can be achieved by promoting transit-oriented communities, improving public transit and active transportation options, and increasing user satisfaction
- To increase public transit use in the GTHA, it is crucial to address barriers by implementing first-mile/last-mile solutions such as ridesharing, bike share programs, and on-demand services. These strategies, combined with high-quality, reliable, and convenient public transit, can make transit more accessible and appealing, and foster a more sustainable and equitable urban transportation system.
- To enhance the GTHA's transportation network, funding for major transit projects and improvements to existing services. Explore innovative revenue models such as dedicating gas tax revenues to transit, leveraging real estate development around transit hubs, and implementing infrastructure-based taxes on properties benefiting from new transit corridors.
- To enhance public transit sustainability, focus on reducing operational costs by integrating advanced technologies such as automated fare collection, real-time data analytics, and predictive maintenance. Electrifying the GO rail system can further cut costs and travel time by providing faster acceleration, efficient deceleration through regenerative braking, and increased overall passenger throughput. Additionally, employing real-time demand prediction methods and adaptive strategies can optimize service levels and manage passenger flow effectively, ensuring better service and operational efficiency.

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