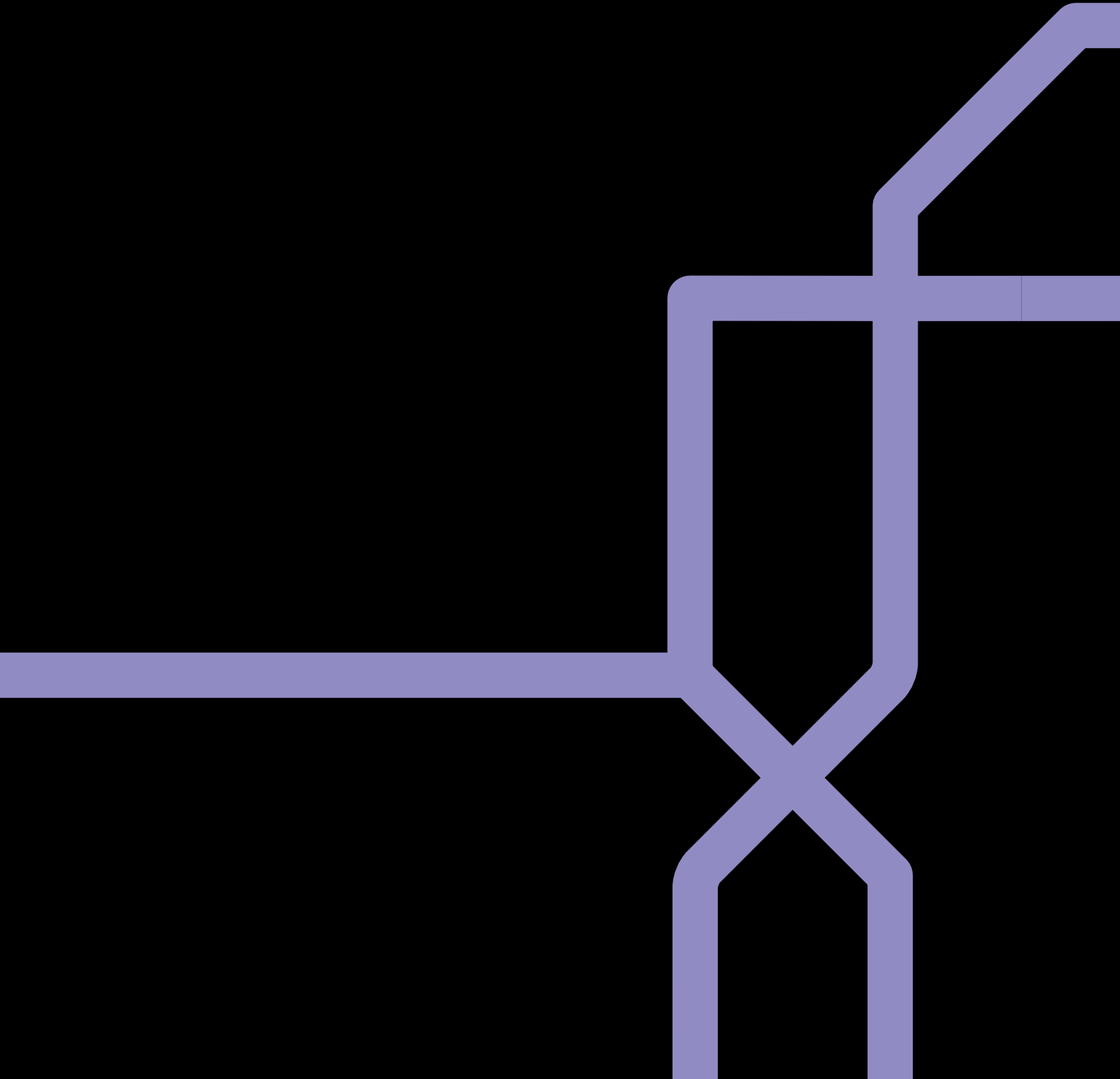
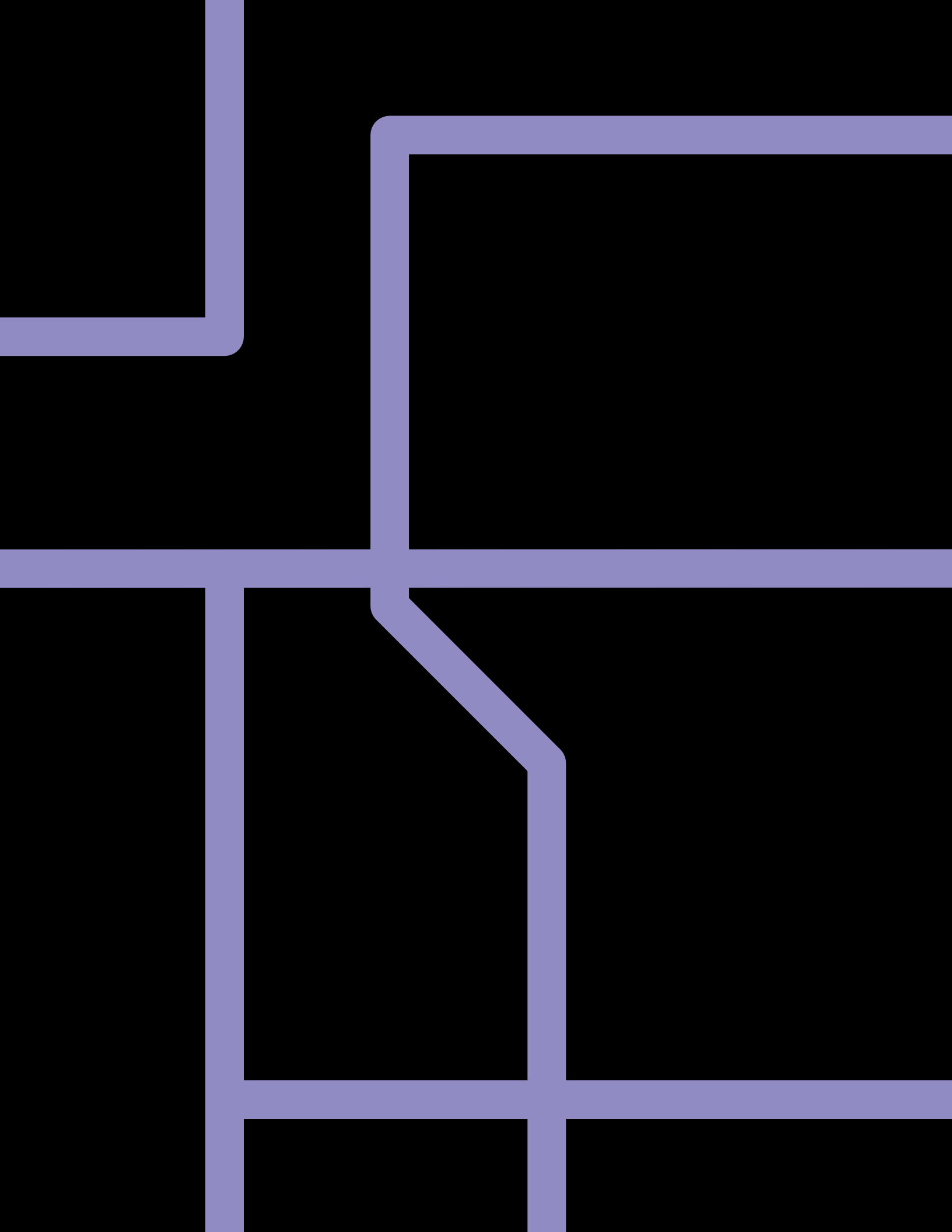


3

Vision, Goals, Strategies and Priority Actions







Vision and Goals

The 2041 RTP holds firm to the original vision of *The Big Move*, but now refines it into the following more concise statement:

**Vision 2041:
The GTHA will have a sustainable transportation system that is aligned with land use, and supports healthy and complete communities. The system will provide safe, convenient and reliable connections, and support a high quality of life, a prosperous and competitive economy, and a protected environment.**

In pursuit of this Vision the 2041 RTP adopts the following Goals:

- **Strong connections–**
Connecting people to the places that make their lives better, such as homes, jobs, community services, parks and open spaces, recreation, and cultural activities.
- **Complete travel experiences–**
Designing an easy, safe, accessible, affordable and comfortable door-to-door travel experience that meets the diverse needs of travellers.
- **Sustainable and healthy communities–**
Investing in transportation for today and for future generations by supporting land use intensification, climate resiliency and a low-carbon footprint, while leveraging innovation.

Central to the Goals and Objectives of the 2041 RTP is the creation of a 'people-centred' transportation system—one that improves people's lives by giving travellers attractive choices. Travellers can ask themselves, "Should I take the GO train, or carpool with my co-worker? Should I take the LRT, or try bike-sharing? Should I walk or take a local bus to my express bus stop? Should I use the Triplinx app to help choose my mode and route?" More and better choices will give people—regardless of their ability, income, home location or schedule—greater access to places in the GTHA.

Another fundamental outcome of this plan will be a regional transit system that is convenient, reliable, and safe. Some parts of the system will run rapidly and frequently and allow people to move quickly over long distances. Other parts will provide local access and offer 24-hour service for those who work nights or stay out late. The system will provide universal access for travellers with disabilities, and will be affordable for people with low incomes who need it most. The system will sustain GTHA communities and businesses, and minimize the impact of transportation on the natural environment.



Setting the stage with transit-supportive guidelines

The Ministry of Transportation's best practice guidelines for transit-supportive development, urban design and transit operations, draw from the experiences of communities in Ontario, across North America, and abroad.

This plan's path to achieving the Vision, Goals and Objectives is described by five key Strategies:

- **Strategy 1—Complete the delivery of current regional transit projects;**
- **Strategy 2—Connect more of the region with frequent rapid transit;**
- **Strategy 3—Optimize the transportation system;**
- **Strategy 4—Integrate transportation and land use; and**
- **Strategy 5—Prepare for an uncertain future.**

Each Strategy includes a number of Priority Actions, which have been identified by screening alternative projects, programs, and policies against key performance criteria. The Strategies and Priority Actions also reflect the passenger transportation hierarchy in Ontario's *Transit-Supportive Guidelines* (2012), and promote a shift in travel behaviour across all modes, while recognizing the diverse needs of travellers.⁴⁴ In declining order, that hierarchy assigns priority to: trip avoidance or shortening; active transportation, such as walking and cycling; public transit; ridesharing (carpooling, vanpooling); car-sharing, ride-sourcing and taxis; and single-occupant vehicles.

The subsequent sections of this chapter address each Strategy in turn.

Strategy 1

Complete the delivery of current regional transit projects



Continue building GO Regional Express Rail to transform transit

The Big Move set in motion a historic expansion of rapid transit infrastructure across the region. Starting with the early successes of the 'Quick Wins' program, followed by the 'Top Transit Priorities' and the provincial *Moving Ontario Forward* program, more than \$30 billion in rapid transit investments has been committed. Nine projects have been completed, and fourteen others are In Delivery (i.e., under construction or in the engineering design stage, as listed in Figure 3). This new infrastructure will build on the region's considerable base of existing transportation assets including Union Station in downtown Toronto and the Lester B. Pearson International Airport, both of which support significant employment concentrations and will remain focal points for transit investment. These projects will provide significant benefits to the people, businesses and institutions in the GTHA, connecting people to more places by transit, making transit a more viable option, and reducing emissions from transportation.

To sustain the current momentum, Strategy 1 recommends completing regional transit projects that are now In Delivery or In Development, while also modifying some projects from *The Big Move* to reflect more up-to-date information. Doing so will help municipalities meet the Province's *Growth Plan* goals by increasing transit's accessibility to more residents of the GTHA.

GO RER is underway, and represents a major focus of the Province's *Moving Ontario Forward* commitment. It will transform the existing GO rail system from a commuter-focused service into a two-way, all-day service on core segments of the network (see Map 3 and Figure 14). The expansion of GO RER after 2025 is addressed in Strategy 2.

By 2025 the ten-year, \$16-billion GO RER program will double GO train service during peak periods and quadruple service during off-peak periods. Electrification will reduce transit operating costs and environmental impacts, and boost travel speeds. All seven GO corridors will see service improvements, with electrified service on core segments, running every 15 minutes or better all-day, in both directions.

GO RER includes additional stations and line extensions to expand GO rail's customer base and provide new seamless connections to other rapid and local transit. New stations are being added to the existing 66 stations. These stations also have the potential to attract new development and intensification in existing communities.

To support GO RER beyond 2025, governments and transit agencies will need to develop a plan to address rail service capacity at Union Station, in coordination with near-term planning for GO RER.

Figure 14: GO RER program to 2025



Improved rapid transit service is coming to the GTHA with Metrolinx's GO Regional Express Rail (GO RER) program. As new subway, light rail transit and bus rapid transit are built across the region, the GO RER program will transform the existing GO rail system into the backbone of an integrated regional rapid transit network.

Since its launch in 1967, the GO Rail system has focused on the suburb-to-downtown commuter market, with diesel locomotive-hauled trains operating primarily in the peak period and in the peak direction. The system has undergone incremental expansions in frequency, span and extent of service since its inception in 1967, most notably the introduction of 30-minute two-way all-day service on the Lakeshore lines in 2013.

The 10-year GO RER program represents a fundamental transformation of the GO rail system from a largely commuter system to a comprehensive regional rapid transit option. Infrastructure expansion, including new tracks, bridges, signals and fleet, will enable the doubling of peak period GO train service and quadrupling of off-peak service by 2024. All seven corridors will see service improvements, with five corridors seeing electric trains running every 15 minutes or better in both directions throughout the day. Additional stations and line extensions will bring the GO rail network to new markets, and new connections to rapid and local transit will enable seamless travel across the region.

GO RER will reduce travel times and give people more ways to get where they want to go with:



**Trains every
15 minutes**



**Service in both
directions**



**Faster electric
trains**

4x

**more off-peak,
evening and
weekend service**

2x

**more weekday
rush-hour service**



Continue building LRT, BRT and subway projects that are In Delivery

In addition to GO RER, the Province’s *Moving Ontario Forward* program includes a commitment to build thirteen LRT, BRT and subway projects by 2025. These projects, currently under construction or in the engineering design stage, include five LRT lines (Eglinton Crosstown, Sheppard East, Finch West, Hamilton B-Line and Hurontario), three BRT lines (Highway 7 West, Yonge North and Yonge South), four GO Transit extensions, and a subway extension (Scarborough), as shown in Figure 3 and Map 3. Together with GO RER, these projects will be the foundation of the future Frequent Rapid Transit Network (see Strategy 2).

Advance key rapid transit projects that are In Development

The next generation of regional transit projects—those that are In Development (in advanced stages of planning and design)—are required to meet the needs of the region in the near term. Thirteen projects have received significant commitments for planning and design from federal, provincial and municipal governments. These projects (listed in Figure 15 and shown on Map 4) include the Relief Line, the Yonge subway extension, and various BRT and LRT lines.

Coordinate with high speed rail projects

For several years, MTO has studied high speed rail in the context of improving Ontario’s internal travel connections and linking it to the global economy through international gateway hubs. In spring 2017, the Province announced its intention to move ahead with preliminary design and environmental assessment of a high speed rail corridor between Toronto and Windsor that will take into account the GO RER expansion program. VIA Rail has also recently announced its intention to pursue a high frequency rail project in the Toronto to Quebec City corridor.

Extensive collaboration will be needed between rail service providers, including Metrolinx and VIA Rail, to ensure that the implementation processes and outcomes of GO RER, the Province’s high speed rail concept and VIA’s high frequency rail service are coordinated and complementary, and use public funds effectively.

Figure 15: In Development rapid transit projects

Planning is underway for the next rapid transit projects to be delivered in the Greater Toronto and Hamilton Area. These new corridors and extensions will complement the existing network, and continue the momentum of North America's largest rapid transit expansion program.

Dundas BRT

New bus rapid transit corridor along Dundas St.; links Toronto, Mississauga and Oakville.

From Kipling Station in Toronto to Bronte Rd. in Oakville.
Length: 22 km

Dundas West Priority Bus

Priority Bus along Dundas St.; links Burlington with Oakville and the Dundas BRT.

From Brant St. in Burlington to Bronte Rd. in Oakville.
Length: 18 km

Brampton Queen St. BRT/LRT

Upgrade of existing Queen St. Zum to rapid transit; links downtown Brampton and York Region.

From Downtown Terminal in Brampton to Highway 50 at the Vaughan border.
Length: 13 km

Durham-Scarborough BRT

Upgrade of existing DRT Pulse service to bus rapid transit along Highway 2; links downtown Oshawa and Scarborough.

From Simcoe St. in Oshawa to Scarborough Centre in Toronto.
Length: 36 km

Eglinton East LRT

Extension of Eglinton Crosstown LRT eastward; links Kennedy Station, University of Toronto Scarborough and Sheppard Ave.

From Kennedy Station to Sheppard Ave. East in Toronto
Length: 10.7 km

Eglinton West LRT

Extension of the Eglinton Crosstown LRT westward to Pearson Airport.

From Mt. Dennis in Toronto to Renforth Gateway and Pearson Airport in Mississauga.
Length: 12 km

Highway 7 East BRT Extension

Extension of the Highway 7 Viva Rapidway eastward; linking Unionville and Cornell.

From Unionville GO Station to Cornell in Markham.
Length: 5.5 km

Highway 7 West BRT Extension

Extension of the Highway 7 Viva Rapidway westward; links Vaughan and Brampton.

From Helen St. in Vaughan to Highway 50 at the Brampton border.
Length: 11.5 km

Relief Line Subway

New subway line linking downtown Toronto, the Bloor-Danforth Subway and Sheppard Ave.; will manage congestion on the Yonge Subway Line.*

From Osgoode Station to Sheppard Ave. East in Toronto.
Length: 18 km

Waterfront East LRT

New light rail transit corridor along the waterfront; links downtown Toronto, the Port Lands and the Beach.

From Union Station to Coxwell Ave. in Toronto.
Length: 7 km

Waterfront West LRT

New light rail transit corridor along the waterfront; links downtown Toronto and Port Credit.

From Union Station in Toronto to Port Credit GO Station in Mississauga.
Length: 22.3 km

Yonge BRT (Richmond Hill, Aurora, Newmarket)

Bus Rapid Transit along Yonge St.; links Richmond Hill, Aurora and Newmarket.

From 19th Ave. in Richmond Hill to Mulock Dr. in Newmarket.
Length: 14.5 km

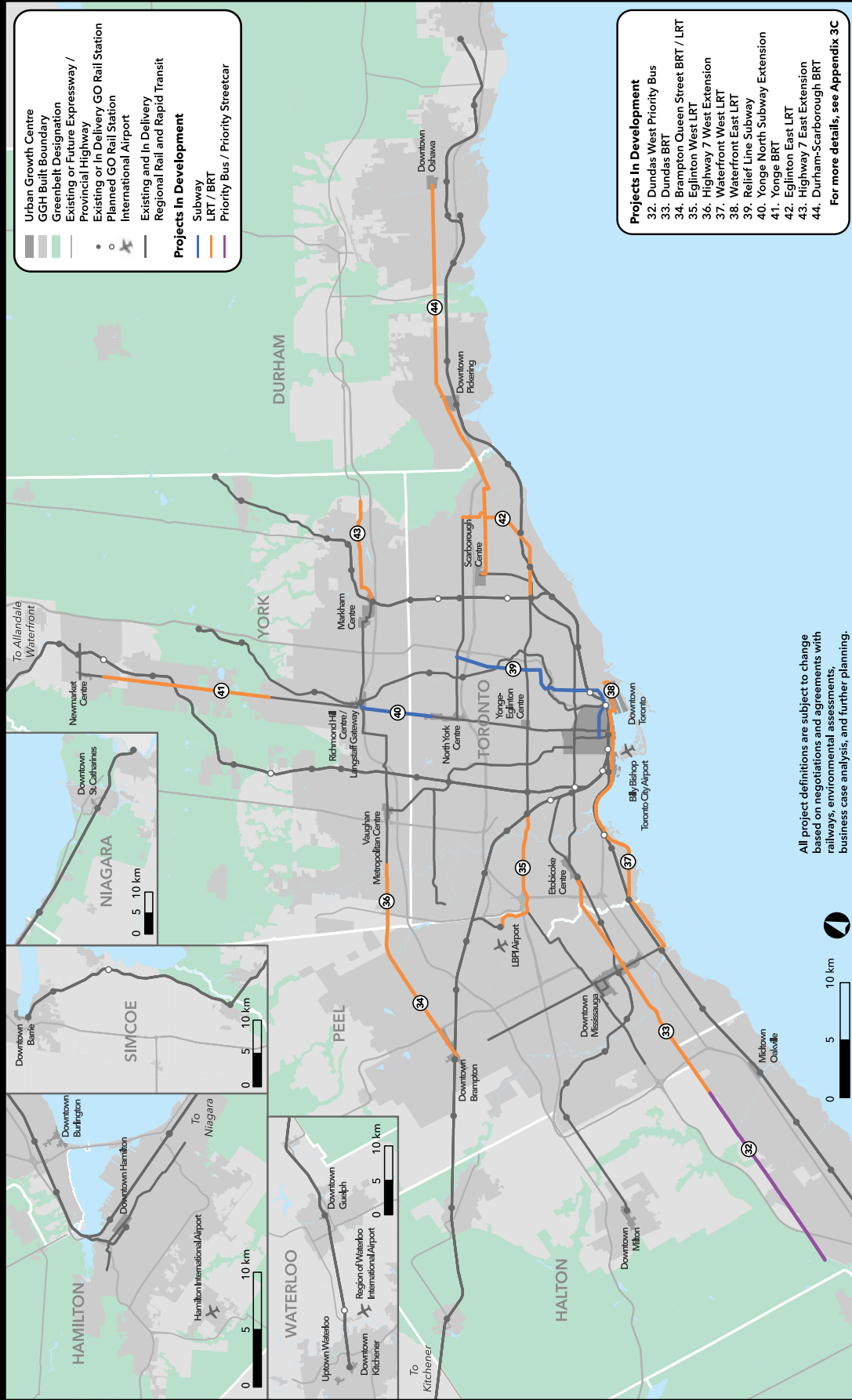
Yonge North Subway Extension

Extension of the Yonge Subway north into York Region; links Richmond Hill to Downtown Toronto.

From Finch Station in Toronto to Highway 7 in Richmond Hill.
Length: 7.4 km

*Length, alignment, station locations and technology for Relief Line North (Danforth Ave. to Sheppard Ave.) to be determined through the Relief Line North Project Assessment.

Map 4: In Development rapid transit projects



Priority Actions for Strategy 1

1.1

Complete In Delivery projects (see Map 3) by 2025, including the GO RER program; the Hurontario, Eglinton, Hamilton B-Line and Finch West LRT lines; and the Highway 7 and Yonge BRT lines:

- Ensure that all projects together deliver a regionally consistent, seamless and high-quality customer experience.

1.2

Advance the In Development transit projects (see Map 4) through preliminary design, detailed design and construction.

1.3

Strengthen Union Station's capacity as the centre of GO RER:

- In consultation with the City of Toronto and the provincial and federal governments, develop a plan to address rail service capacity at Union Station to accommodate the growth of GO RER beyond 2025.
- Ensure that all decisions regarding improvements to Union Station and adjacent areas are consistent with and protect for long term objectives.

1.4

Coordinate planning and implementation of In Delivery and In Development projects with the Province, the federal government and VIA Rail Canada, focusing on:

- high speed rail;
- high frequency rail;
- optimizing shared resources including Union Station and rail corridors; and
- integrating services for a seamless experience.

Strategy 2

Connect more of the region with frequent rapid transit



Toronto improves surface transit

The City of Toronto's Official Plan (2015) commits to "increasing transit priority throughout the City by giving buses and streetcars priority at signalized intersections and by introducing other priority measures... such as reserved or dedicated lanes for buses and streetcars; and limiting or removing on street parking during part or all of the day" as a means of supporting its growth management objectives.

The Toronto Transit Commission (TTC) also launched its 10-Minute-or-Better service network in 2015 for all streetcar routes and 52 bus routes. In 2017, it announced an enhanced Express Bus Network that will provide new or enhanced service on 13 routes (with another 8 pending future review). The network will offer 15-minute or better frequencies all day, using strategies to improve speed and reliability such as queue jump lanes and transit signal priority. The City of Toronto in conjunction with the TTC also initiated the King Street Pilot project, which uses a variety of turning and parking restrictions for automobiles, as a contribution towards the development of a comprehensive Surface Transit Priority Plan that lets buses and streetcars move more quickly on key corridors without getting stuck in traffic.

The expansion of convenient, fast and frequent rapid transit across the region currently underway will provide travellers with good alternatives to driving, in particular for trips to and from downtown Toronto. Strategy 2 is focused on extending the reach of frequent rapid transit and connecting various parts of the GTHA with a Frequent Rapid Transit Network.

With GO RER and subways acting as its spine, the Frequent Rapid Transit Network will connect urban centres, employment nodes and regional destinations with Priority Bus, Frequent Regional Express Bus, LRT and BRT projects. It will help municipalities meet the Province's *Growth Plan* goals by making frequent rapid transit more accessible to more GTHA residents.

These transit investments will have wide-reaching benefits for quality of life through reduced congestion and automobile dependency, improved air quality and reduced greenhouse gas emissions, improved travel affordability, better health, and greater accessibility to different parts of the region.



Develop a Frequent Rapid Transit Network across the GTHA

Strategy 2 proposes the development of a Frequent Rapid Transit Network across the GTHA to provide high-quality transit to more people in more places (see Map 5 and Map 6).⁴⁵ The network is a logical approach to the problem of moving people efficiently by transit in a region with multiple major population and employment concentrations, where travel demand patterns are increasingly dispersed and not simply focused on one central core. This strategy proposes several additional BRT, LRT, Priority Bus, subway and RER projects (see Map 5) in addition to existing and planned projects to form an integrated Frequent Rapid Transit Network (see Map 6) that will allow people to travel quickly and seamlessly across the GTHA.

Many regions in North America have frequent transit networks that offer a base grid of 10- to 15-minute service (e.g., TransLink's Frequent Transit Network⁴⁶ in Metro Vancouver). The Toronto Transit Commission (TTC) also operates a network of frequent bus and streetcar services. The Frequent Rapid Transit Network proposed in Strategy 2 goes beyond frequent service to also provide high-quality, fast and reliable service across the GTHA. As Figure 16 shows, it will feature:

- 15-minute service or better, all-day, seven days a week;
- more reliable service through the use of managed lanes to provide protection for transit from mixed traffic, and transit signal priority measures;
- faster service due to wide spacing of stops and transit signal priority; and
- efficient transfers between routes, enabling a traveller to get anywhere in the GTHA easily and reliably without looking at a schedule.

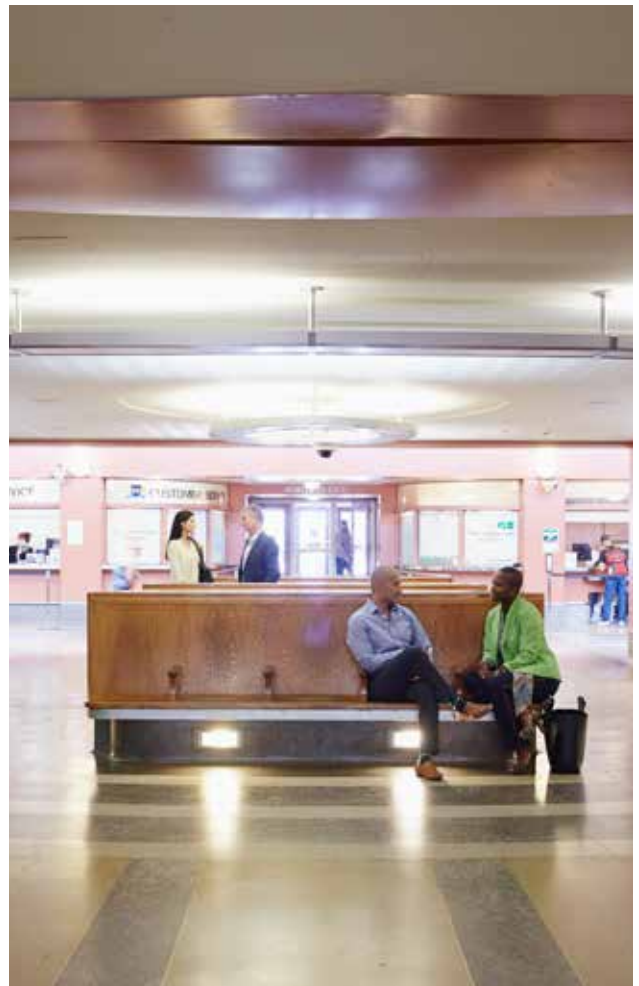
The Frequent Rapid Transit Network consists of regionally significant, high-demand transit corridors that connect Urban Growth Centres, key Mobility Hubs and areas of high population or employment density. It will fill gaps in the regional network, and provide improved transit service throughout the region, including in the lowest income areas where it is needed most. A key strategy will be the use of managed lanes to provide protection for transit from mixed traffic, transit signal priority, and other improvements. As Figure 17 shows, major elements of the Frequent Rapid Transit Network will include:

- existing rapid transit lines (see Map 2);
- 15-minute all-day GO RER service and other recently completed and In Delivery rapid transit projects (see Map 3);
- In Development transit projects (see Map 4);
- additional LRT, BRT and subway projects to meet regional needs to 2041 (see Map 5);
- expansion of 15-minute GO RER beyond 2025 (see Map 5);
- Priority Bus and Priority Streetcar corridors (see Map 5); and
- Frequent Regional Express Bus routes (see Map 5 and Map 7).

The Frequent Rapid Transit Network includes a variety of transit services because areas with slower growth and lower densities need different approaches than those with higher growth and higher densities.⁴⁷ It will be most effective where residential and employment areas are located close to transit stations, so travellers can easily walk to and from home or work. It will provide strong, high-quality transit connections to all parts of the region, and not just to downtown Toronto.

Gaps in connectivity will need to be addressed through service integration, including the connection of local bus services to the Frequent Rapid Transit Network. The Frequent Rapid Transit Network would in some cases replace existing services, and in other cases would need to work alongside existing local services that provide local stops while the Frequent Rapid Transit Network service would make fewer stops.

The Frequent Rapid Transit Network will focus on providing a consistent and seamless traveller experience regardless of who operates the various parts of the system. Close collaboration among Metrolinx, the Province, municipalities and transit agencies will be key to establishing priorities, identifying roles and responsibilities and knitting the region together with frequent rapid transit.



Expand 15-minute GO RER after 2025

GO RER will be a catalyst for how people use rapid transit in the region and a strong anchor for the Frequent Rapid Transit Network, as well as generating positive economic benefits.⁴⁸ Building on the current GO RER program, Strategy 2 proposes expanding the 15-minute, two-way all-day GO rail network to include service on the Milton line, and extensions of 15-minute service on the Barrie, Stouffville and Lakeshore East and West lines (see Map 5). The need for new stations on the network will be assessed during implementation planning, including business case review.

Providing 15-minute, two-way, all-day service on the Milton Line will be subject to a review of physical constraints, including require extensive infrastructure investments including track expansions and upgrades, and may include the construction of a new freight rail corridor. The proposed RER expansion would be subject to negotiations with freight rail operators where the corridors are not in public ownership.

Build additional LRT, BRT and subway projects

In addition to the transit projects that are In Delivery and In Development, Strategy 2 proposes building several new LRT, BRT and subway projects by 2041 (see Map 5). These are needed to fill key gaps in the rapid transit network and address capacity needs. Most of these projects were identified in *The Big Move* for 2031, and they continue to be needed within the 2041 RTP's time horizon.

BRT service reduces travel times in Mississauga

The 18-km Mississauga Transitway, opened in 2014, allows buses to run unhindered by general traffic and connects to the TTC subway system, Mississauga City Centre and employment hubs like the Pearson International Airport Corporate Centre. Upon full implementation, the BRT line will serve 5 million riders annually with time savings of 15 to 18 minutes per trip. Each of its 12 stations features heated waiting areas, wireless internet access, bicycle lockers and full accessibility.

Figure 16: Key principles of the Frequent Rapid Transit Network

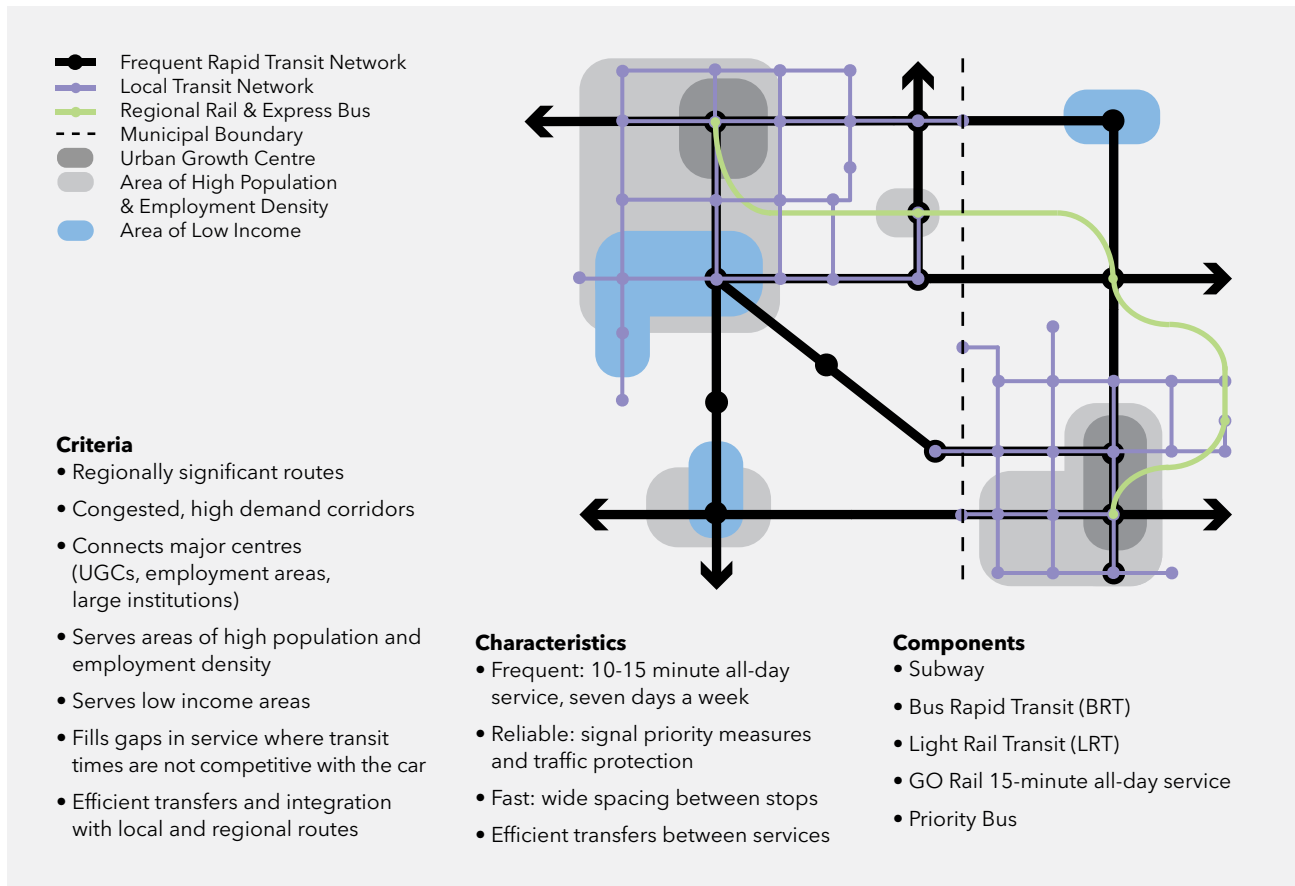


Figure 17: Components of the Frequent Rapid Transit Network



Develop Priority Bus corridors

Many parts of the GTHA are some distance away from existing, In Delivery, In Development, and proposed LRT, BRT, subway and GO rail facilities. To improve transit service in these areas, Strategy 2 proposes the creation of Priority Bus corridors (see Map 5). These are a practical and cost-effective way of providing fast, frequent and reliable transit service to more people without the need for a dedicated right-of-way (see Figure 18). Priority Bus corridors will be part of the Frequent Rapid Transit Network, along with BRT, LRT, subway and 15-minute GO RER corridors.

Priority Bus corridors can have many benefits. They allow buses to run quickly and reliably by providing protection from mixed traffic (e.g., HOV lanes on arterial roads, turn prohibitions or other traffic restrictions) and using other transit priority measures such as queue jump lanes and signal priority at intersections. Priority Bus routes running in Priority Bus corridors will have wider spacing between stops (e.g., every 300 to 800 metres) to improve travel times over longer distances. Features such as all-door boarding and safe, comfortable stations can further improve service and enhance the customer experience. An advantage of Priority Bus corridors is the potential to implement additional priority measures (e.g., new queue jumps, more aggressive signal priority, or new turn prohibitions for mixed traffic) as conditions evolve (e.g.,

in response to population and employment growth, or an increase in congestion). These corridors can eventually be converted into BRT, LRT or even subway corridors as demand grows. They can also be adapted to new uses, such as carrying driverless shuttles when autonomous vehicle technologies arrive. Finally, Priority Bus corridors are likely to have lower per-kilometre capital costs than BRT and LRT corridors, and can be implemented more quickly than other more capital intensive investments.

Different Priority Bus features can be used in different corridors to achieve desired transit speed and reliability targets in varying conditions (e.g., ridership, congestion, right-of-way constraints). Figure 19 shows typical features of Priority Bus corridors, and compares them to BRT corridors which have many similarities. Priority Bus corridors and BRT corridors can be used together while maintaining route and schedule flexibility; a single bus route could operate in a BRT corridor through a higher-density area and continue into a Priority Bus corridor in a lower-density area, without requiring passengers to transfer (see Figure 20). The same principles and benefits of Priority Bus corridors can be applied to streetcars and light rail vehicles to create Priority Streetcar corridors. As with BRT and Priority Bus, a light rail vehicle could operate partially in an LRT corridor and in a Priority Streetcar corridor depending on local conditions, without requiring a transfer.

The creation of a Priority Bus corridor network for the GTHA will require a collaborative strategy that addresses implementation priorities as well as the roles and responsibilities of various municipal departments. A rollout of the Priority Bus corridor network could begin quickly, and the performance of individual routes could be reviewed at fixed time intervals to determine where enhancements or other adjustments are appropriate. The creation of Priority Bus corridors in congested, high-demand areas can provide dramatic improvements to transit service in the short term as more capital-intensive solutions (e.g. BRT, LRT, subway) are implemented over the longer term.

Many international cities have reinvented their bus networks to include high-performing bus services, and have attracted more riders (Figure 21). Closer to home, several GTHA transit agencies have started to introduce some Priority Bus features along high-demand routes to provide enhanced bus services that are faster, more reliable and comfortable.⁴⁹ The proposed Priority Bus corridor network for the GTHA builds on many of these routes, some of which are expected to see sufficient demand to warrant BRT construction by 2041.

Examples of some enhanced transit routes in the GTHA today include:

- Brampton Transit’s five Züm bus routes, which boast 15-minute service (all day, or in some cases only during peak periods), queue-jump lanes at some intersections, transit signal priority at key intersections used when buses are behind schedule, and real-time next-bus arrival information at stops.
- Durham Transit’s Pulse route on Highway 2, which features 15-minute service or better all day, transit signal priority at some intersections, and dedicated bus lanes along some sections.
- York Region Transit’s six Viva routes, which offer 15-minute service or better on much of the network, transit signal priority at some intersections, dedicated BRT rights-of-way in some sections, and interlined routes that share a dedicated right-of-way.
- The TTC’s express bus routes, which have wider stop spacing along with some use of HOV lanes, and limited transit signal priority. The TTC is also planning a next-generation express bus network offering 15-minute service or better, with queue jump lanes at selected intersections and expanded use of transit signal priority.
- The City of Toronto and TTC’s King Street pilot project, which has sped up streetcar routes using a variety of turning and parking restrictions for automobiles, and curbside stops to improve pedestrian access.

Figure 18: Typical features of Priority Bus

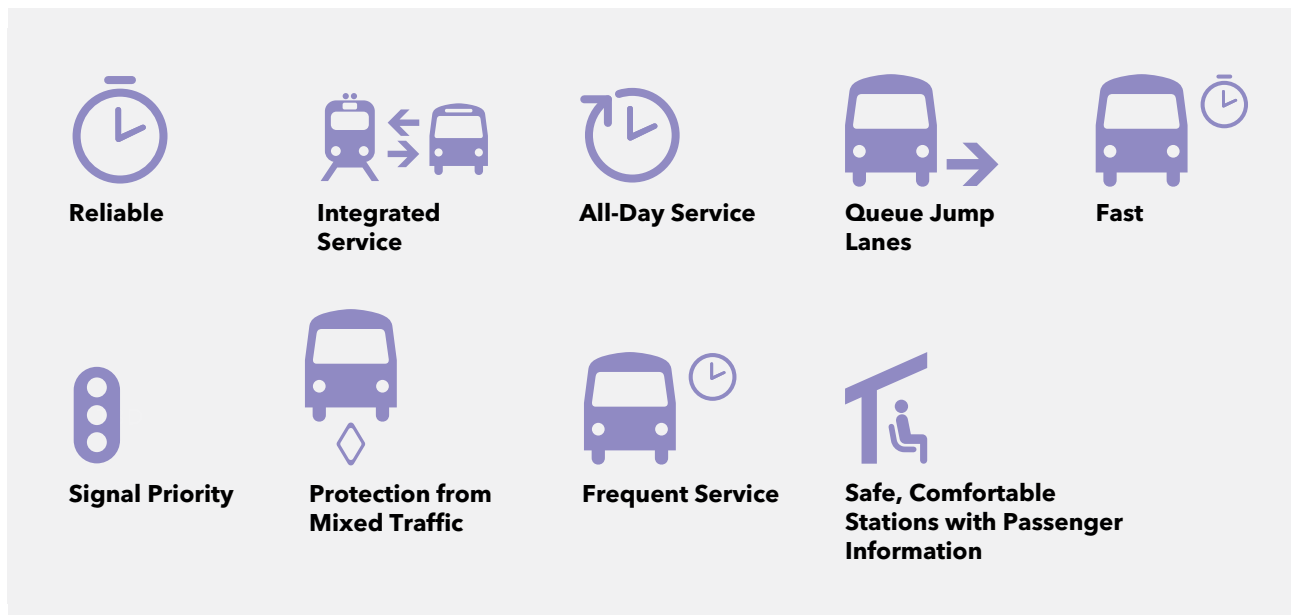
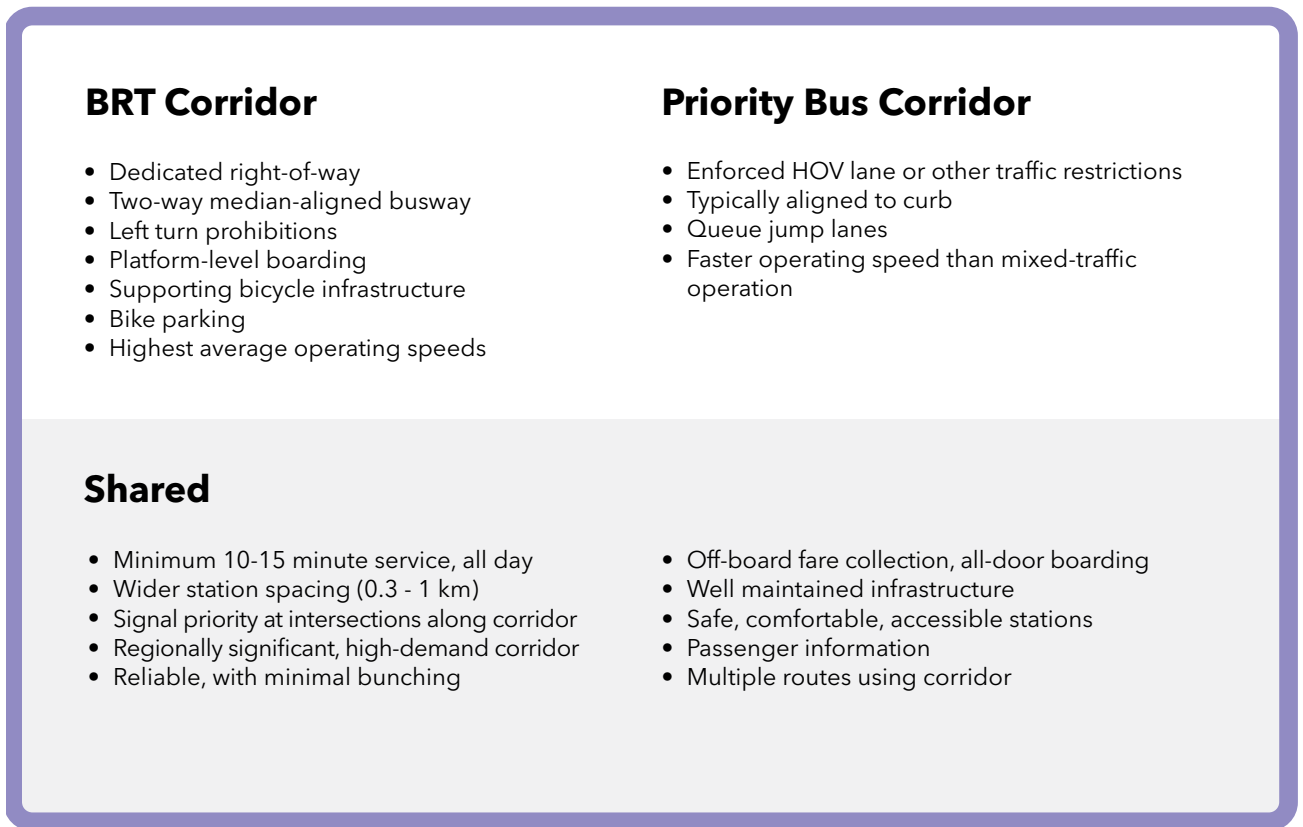
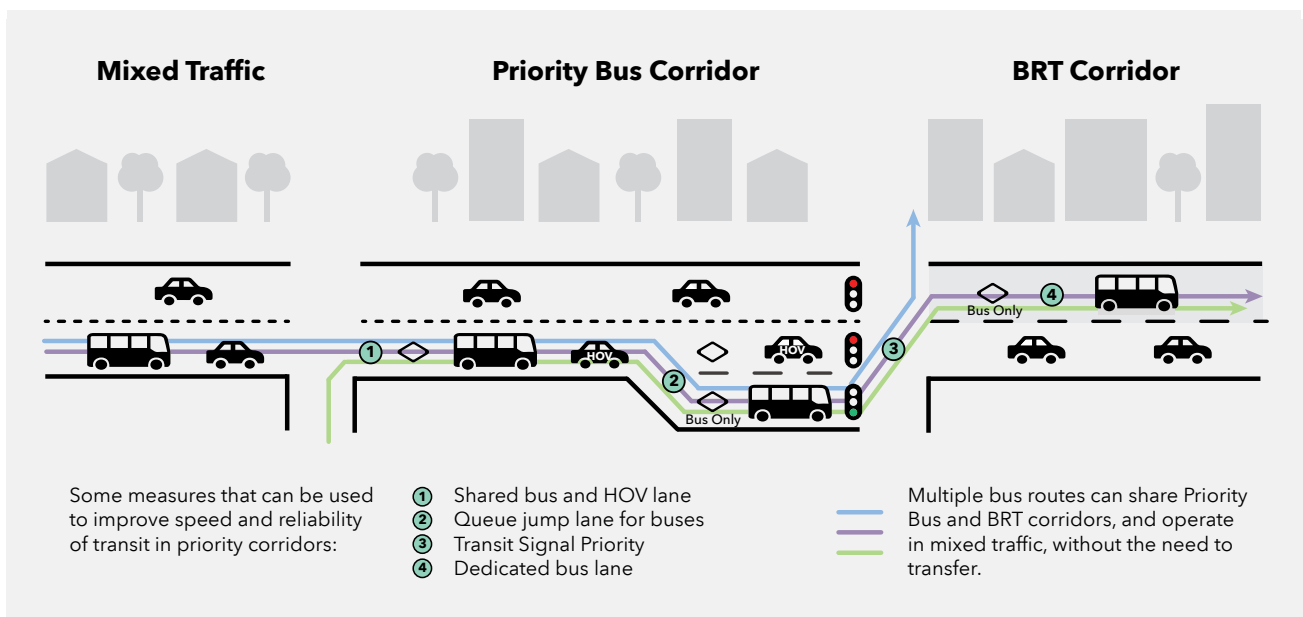


Figure 19: Key characteristics of Priority Bus and BRT



Source: Adapted from The Institute for Transportation and Development Policy, The BRT Standard, 2016.

Figure 20: Example of bus operations in Priority Bus and BRT corridors



Develop Frequent Regional Express Bus routes

With the implementation of RER and the delivery of all-day service on most GO rail corridors, GO bus routes and services will be reviewed as they evolve towards playing a new role in the region's transit network. Routes can be restructured to increasingly link transit hubs and Urban Growth Centres, enhancing and creating new connections in the network.

Implement Frequent Regional Express Bus Service

Frequent Regional Express Bus is a new type of service proposed for core areas of the region not well-served by 15-minute GO RER. With 15-minute service or better all day, these longer distance routes are also part of the Frequent Rapid Transit Network. Different types of investments (than for Priority Bus) are needed to ensure these buses provide superior service and reliability compared to today's GO bus routes. This includes taking advantage of an expanded managed lanes network on 400-series and other major highways, or by using Highway 407 which has a high level of service due to its tolling structure. Other opportunities include dedicated bus access ramps to minimize delay for buses entering and exiting highways, and convenient, high-quality stations directly on or adjacent to the highway that minimize delays for through-service passengers while providing good connections to other frequent rapid transit and local transit routes.

Map 5 and Map 7 show the proposed Frequent Regional Express Bus routes and managed lanes network. The network of HOV lanes and other managed lanes on 400-series highways will be determined by MTO in consultation with Metrolinx, as part of the ongoing *GGH Transportation Plan*.

Building improved stations and transit connections along Highway 407 could boost the effectiveness of frequent east-west bus routes in the corridor, and could be implemented before the construction of a separate, dedicated transitway. Similar treatments can be phased in along other highway corridors where HOV infrastructure is in place to allow for reliable operation of Frequent Regional Express bus services without the need to widen the highway. Further discussion of HOV lanes is presented under Strategy 3.

The region's network of carpool lots will serve as important hubs for accessing Regional Express Bus services. Where appropriate, these carpool lots can also be integrated with stations.

Develop coordinated regional transit routes

Operating less frequently, Regional Express Bus routes are a second new type of GO bus route (see Map 7). They would serve the transit needs of areas not well connected by the regional rail network, typically over longer distances. These services are similar to today's GO bus services but could operate more reliably than today by taking advantage of HOV lanes on highways and other transit priority measures that would be put in place for the Frequent Rapid Transit Network.

Two-way, all-day GO Rail service on the Richmond Hill line and on the Bowmanville extension will provide additional regional service to areas that can benefit from improved capacity and service but do not require the frequency proposed for the Frequent Rapid Transit Network.



Ottawa Transitway: Queensway Station (top), Longfield Station (bottom).

Figure 21: Examples of enhanced bus systems in the United States and Australia with features of Priority Bus



Seattle, RapidRide

- Service at least every 10 minutes during peak periods, and approximately every 15 minutes all day and on weekends.
- Services fewer stops for faster travel.
- Makes extensive use of Transit Signal Priority technology to the signals – shortening a red light, or extending a green light – to ensure buses remain on schedule, even in mixed traffic.
- On some lines, uses queue jump lanes to bypass traffic.
- Utilizes roadway improvements such as HOV lanes, bus bumpouts.
- Contactless smart card is used for off-board payment enabling all-door boarding.
- Real time passenger information at the stations shows time until the next bus arrives.
- Automated Vehicle Location system determines buses' actual location on the route.



Portland Metropolitan Area, The Vine

- Service every 10 minutes during peak periods, every 15 - 30 minutes all day and on weekends.
- Operates in mixed traffic with curbside stations.
- Transit Signal Priority allows Vine buses to communicate with the signal system along the route.
- Off-board Fare Collection: Customers may pre-purchase fares at ticket vending machines at each station before boarding which will speed up boarding.
- Low-floor buses in combination with raised station platforms for level boarding.
- Stations are located approximately 500 m apart.
- Stations include real-time arrival signs.



Los Angeles, Metro Rapid

- Express bus service with bus rapid transit characteristics.
- Operates in mixed environments and HOV lanes.
- Has fewer stops than the local bus service.
- Rapid stops located only at major intersections and transfer points.
- Signal priority is used within the City of Los Angeles boundaries.
- Service five days a week, at least every 10 minutes during peak periods and every 20 minutes midday and evenings. Some rapid routes operate on weekends as well.



Sydney, Metrobus

- Service every 10 minutes during peak periods, every 15 minutes during off-peak periods during the day, and every 20 minutes in the evening and on weekends.
- Uses HOV lanes and transit signal priority.
- Spaces between stops are increased.
- Easy connections – Metrobus services stop at major bus and rail interchanges.
- Wheelchair-friendly – entry and priority seating make Metrobus very accessible.
- Each bus features the latest environmental controls to reduce greenhouse gas emissions.

Extend GO Transit service outside the GTHA

Metrolinx's mandate includes providing GO rail and bus services to municipalities in the GO Transit service area outside the GTHA. Increased service levels are In Delivery, and are expected to grow in support of *Growth Plan* implementation. Future planning for GO Transit infrastructure and services will continue to consider the needs of the outer ring, and will be coordinated with local municipal plans to support station area access and development.

Develop a regional 24-hour transit network

The provision of 24-hour transit service is becoming more important as the regional economy grows more diversified and part-time and contract employment becomes more prevalent. Currently, only the TTC has a 24-hour bus/streetcar network. As housing costs rise, lower-income households are likely to disperse throughout the region, farther away from quality transit. Lower-income households are more likely to rely on transit, and members of low-income households are more likely to hold part-time or contract jobs. A reliable 24-hour transit network throughout the region would improve access to employment and other opportunities for people who need it most, and make it easier for people who depend on transit to get around in a 24-hour society. While the 24-hour transit network would be comprised of routes offered by the various operators in the GTHA, it would be designed to function as an integrated and connected system.



Züming Along

Since 2010, Brampton Transit has increased transit ridership by boosting service levels and introducing Züm, a network of five enhanced bus routes with limited stops to improve speed. Züm uses state-of-the-art buses and customer-focused technologies to improve the attractiveness of the service. Infrastructure that enables transit signal priority was implemented to improve reliability. The number of riders using Brampton Transit increased 72% from 12.3 million in 2009 (prior to Züm) to 21.2 million in 2015.

Strengthen and support local transit services

Although the 2041 RTP will significantly increase the number of people that live within walking distance of frequent rapid transit service, most people will still access the Frequent Rapid Transit Network using local transit or another mode. Local transit services thus play an important role in supporting the Frequent Rapid Transit Network; they also carry a majority of all transit riders, including low-income groups, and a majority of transit riders during off-peak periods (i.e., mid-day, weekends and evenings).

There are many important local routes operated by transit agencies across the GTHA that carry substantial numbers of riders but are not part of the regionally significant Frequent Rapid Transit Network. This does not preclude municipalities and local transit agencies from implementing transit priority measures on locally significant routes.

The Toronto streetcar network, in particular, along with several TTC bus routes, plays an important role in connecting significant numbers of people to jobs, shopping, entertainment, education and other services. Many Toronto residents rely on transit for their daily travel needs. About 52% of households in downtown Toronto and 24% of households in the rest of Toronto do not own a car (see Figure 22).⁵⁰ Several TTC streetcar and bus routes carry more riders on an average day than are carried by some entire transit systems in the GTHA. Given the importance of these routes, many of which run along important east-west arteries through the centre of downtown Toronto, the largest concentration of employment in Canada, they should be considered for inclusion in the Frequent Rapid Transit Network. With protection from traffic, wider spacing between stops, and traffic signal priority, they could provide a reliable and fast connection through the heart of the city for hundreds of thousands of daily users. The City of Toronto's Official Plan includes policies for transit priority on key surface transit routes. Currently, the King Street pilot project limits automobile traffic to prioritize streetcar travel along the central portion of the route; the results of this pilot will provide insight into the feasibility and effectiveness of traffic restrictions in dense urban areas.

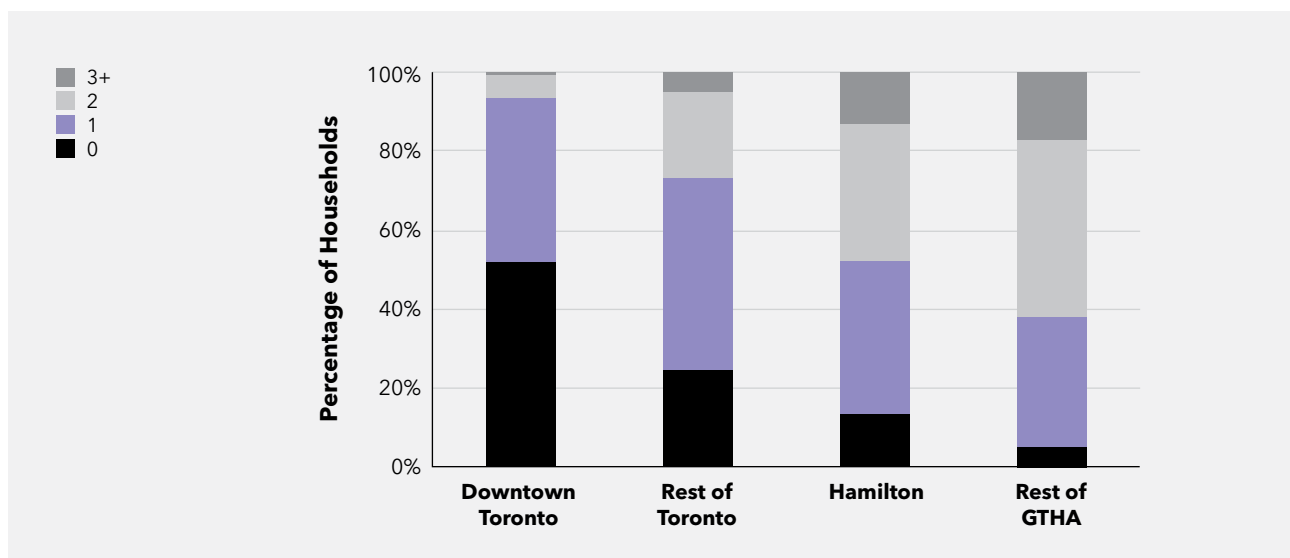
Improve airport access by transit

Lester B. Pearson International Airport (LBPIA) is the busiest airport in Canada, and the airport area represents the second-highest concentration of jobs in the GTHA.⁵¹ The Union Pearson Express and improved local and regional bus services have introduced new transportation options for airport passengers, employees, and those that live in the vicinity of the airport. Proposed linkages through the Eglinton West LRT, the Finch West LRT, and other Priority Bus corridors will further enhance transportation options.

At this time, however, travel to the region's airport areas, in particular Pearson International Airport and John C. Munro Hamilton International Airport, is still dominated by auto use.⁵² Changing this will require the development of more attractive and integrated transit services, and better connectivity by transit and active transportation. Implementing these measures will require coordination with the many stakeholders responsible for these critical hubs of employment, commerce and tourism.

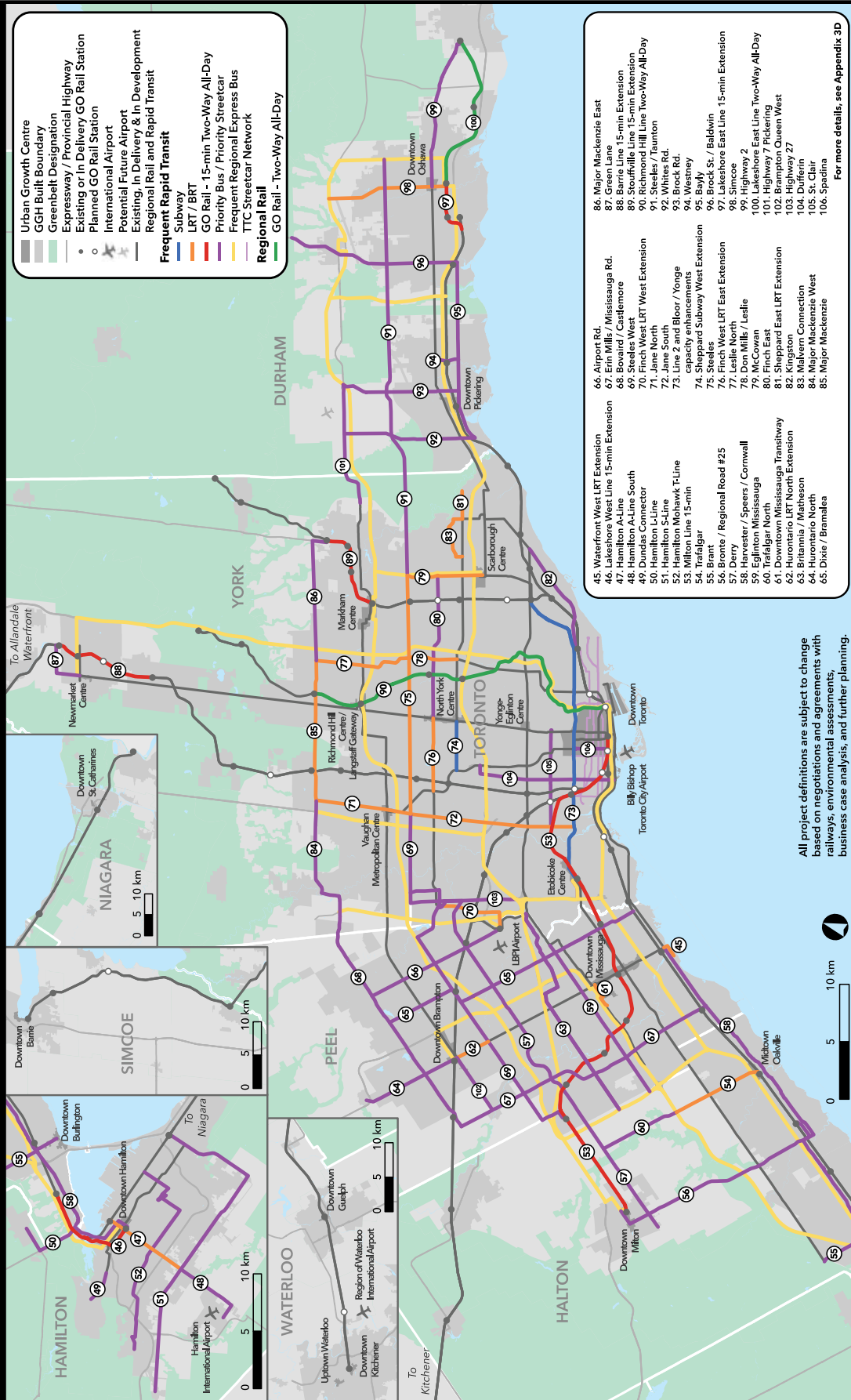
The Greater Toronto Airports Authority has recently brought forward a plan for a new Regional Transit Centre at Pearson Airport to support ongoing airport growth and strengthen the airport's role as a regional economic development catalyst. As proposed, this new Regional Transit Centre has the potential to boost transit access to the airport as well as the surrounding employment area, and to better connect the airport with surrounding communities and the larger region.⁵³

Figure 22: Average household vehicle ownership in the GTHA, 2016



Source: University of Toronto Data Management Group, 2016 Transportation Tomorrow Survey

Map 5: 2041 Frequent Rapid Transit Network

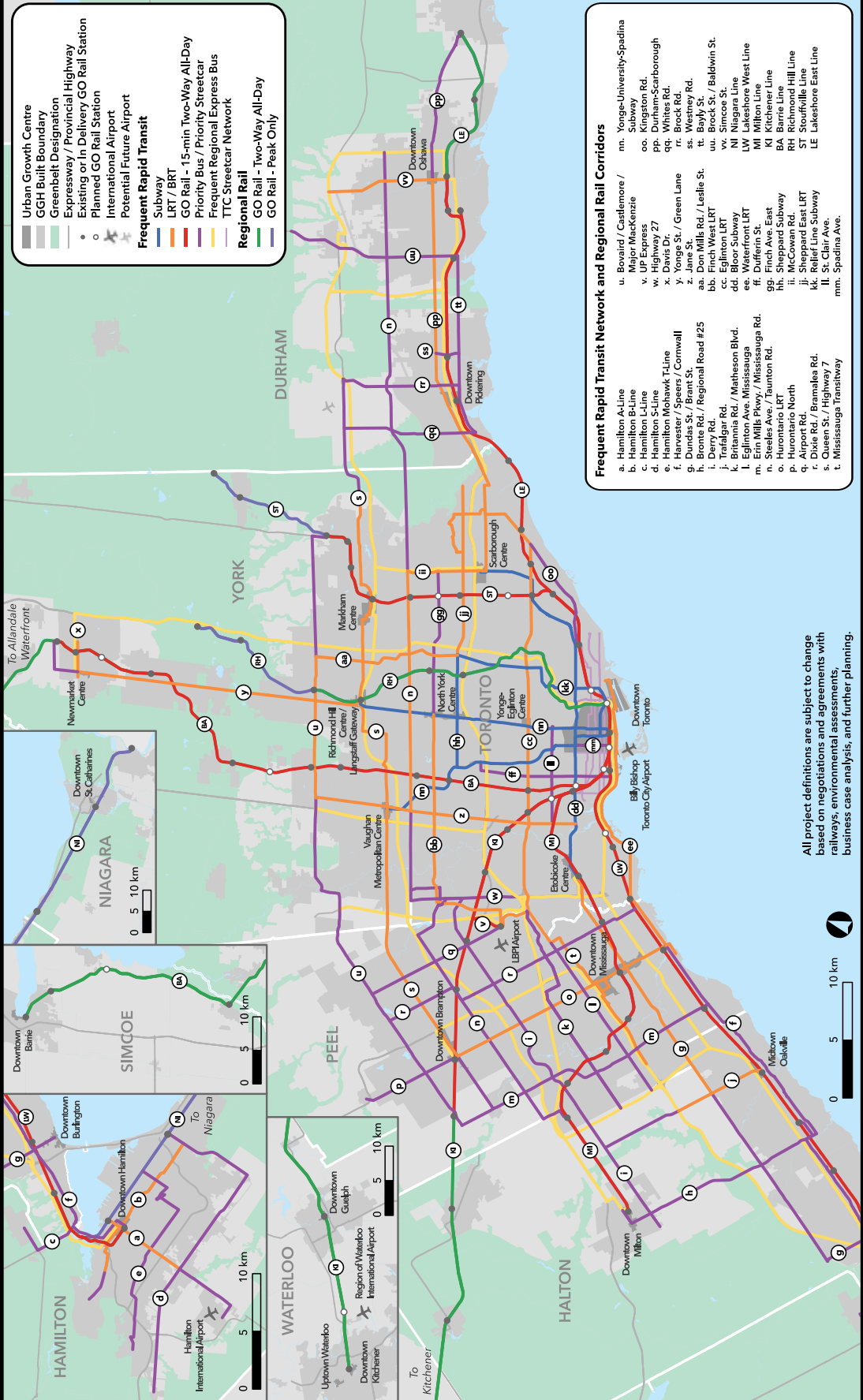


- 66. Airport Rd.
- 67. Erin Mills / Mississauga Rd.
- 68. Bovard / Castlemore
- 69. Airport Rd. West LRT Extension
- 70. Finch West LRT West Extension
- 71. Jane North
- 72. Jane South
- 73. Line 2 and Bloor / Yonge capacity enhancements
- 74. Sheppard Subway West Extension
- 75. Steeles
- 76. Finch West LRT East Extension
- 77. Leslie North
- 78. Leslie South
- 79. McCowan
- 80. Finch East
- 81. Sheppard East LRT Extension
- 82. Hurontario LRT North Extension
- 83. Hurontario / Matheson
- 84. Hurontario North
- 85. Dixie / Bramalea
- 86. Major Mackenzie East
- 87. Green Lane
- 88. Barrie Line 15-min Extension
- 89. Airport Rd. East LRT Extension
- 90. Richmond Hill Line Two-Way All-Day
- 91. Steeles / Taunton
- 92. Whites Rd.
- 93. Brock Rd.
- 94. Westney
- 95. Bayly
- 96. Brock St. / Baldwin
- 97. Lakeshore East Line 15-min Extension
- 98. Simcoe
- 99. Highway 2
- 100. Highway 7
- 101. Highway 7 Pickering
- 102. Brampton Queen West
- 103. Kingdon
- 104. Highway 27
- 105. St. Clair
- 106. Spadina

All project definitions are subject to change based on negotiations and agreements with railways, environmental assessments, business case analysis, and further planning.

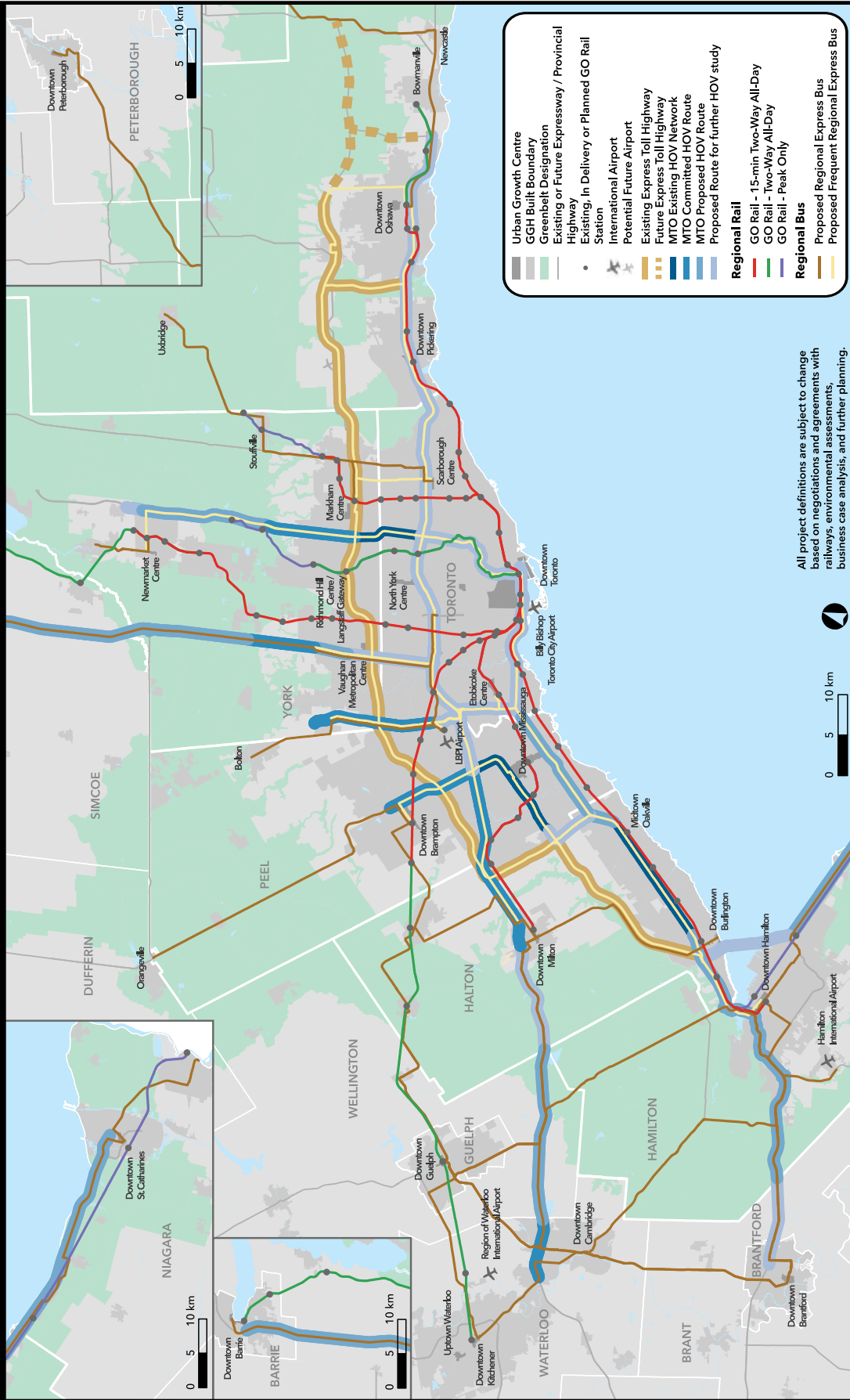
For more details, see Appendix 3D

Map 6: Complete 2041 Frequent Rapid Transit Network



All project definitions are subject to change based on negotiations and agreements with railways, environmental assessments, business case analysis, and further planning.

Map 7: Proposed 2041 HOV and Regional Express Bus Network



All project definitions are subject to change based on negotiations and agreements with railways, environmental assessments, business case analysis, and further planning.

Priority Actions for Strategy 2

2.1

Implement a comprehensive and integrated Frequent Rapid Transit Network by 2041 that includes:

- existing subway, transitway and BRT services (see Map 3);
- 15-minute GO Regional Express Rail on the Lakeshore East and West, Kitchener, Stouffville and Barrie Corridors, In Delivery for 2025 (see Map 3);
- In Delivery BRT and LRT projects (see Map 3);
- In Development projects (see Map 4);
- additional transit infrastructure improvements to resolve key gaps (proposed new LRT and BRT projects, see Map 5);
- additional 15-minute GO RER services beyond 2025 (see Map 5);
- a Priority Bus and Priority Streetcar system that connects existing and planned rapid transit, LRT and BRT (see Map 5); and
- Frequent Regional Express Bus services (see Map 5 and Map 7).

2.2

Strengthen and support the ability of local transit to provide reliable service in urban areas where demand for transit is high, and to connect to the Frequent Rapid Transit Network.

2.3

Develop and implement a 24-hour transit network composed of strategic regional routes to address growing off-peak markets and destinations.

2.4

Deliver a Regional Express Bus Network to serve long-distance transit markets not served by GO RER (see Map 7).

2.5

Improve access to airports, and prioritize transit use by airport passengers and workers:

- Coordinate with the Greater Toronto Airports Authority, Ports Toronto, the John C. Munro Hamilton International Airport and the federal government on ground transportation plans to the region's airports and surrounding areas.
- Coordinate with the planning and implementation of Pearson Airport's Regional Transit Centre to facilitate enhanced transit access to the airport, and to enable Pearson and the surrounding employment areas to continue supporting economic growth throughout the GTHA.

2.6

Strengthen connections between the GTHA and the Region of Waterloo, to support the economic prosperity of the GGH and the growth of one of North America's largest technology clusters.

Strategy 3

Optimize the transportation system



Integrate transit fares and services

Optimizing the GTHA's transportation system means making the best possible use of existing and future transportation assets. Actions recommended in Strategy 3 include integrating fares and services, planning for the first- and last-mile of each traveller's journey, improving the traveller experience, providing universal access, using design excellence in planning, improving safety, and using roads and highways efficiently.

The 2041 RTP focuses on providing a seamless transit experience for travellers through integrated fares, payments, services and schedules. The expansion of regional rapid transit in the GTHA makes fare integration a pressing issue, especially with the vision of a Frequent Rapid Transit Network that crosses multiple boundaries.

To date, progress on integrating elements of transit fares (including fare levels, fare structure, transfers, products, concessions and payment methods) has been limited and voluntary. Transit agencies outside Toronto have been working to better integrate their services, and they typically recognize each other's transfers. Most local transit agencies provide reduced fares for people transferring to or from GO. The PRESTO card makes it easier for a traveller to make seamless transfers between different transit service providers.

There is much potential for increased cross-boundary ridership, but significant barriers exist to operating cross-boundary services. These barriers need to be addressed and Metrolinx, in partnership with the region's transit agencies, has done extensive work in this area.

There are currently eleven different fare structures in the GTHA, with each transit service provider setting its own rules and prices. There are also different co-fare arrangements when travellers transfer between transit systems. This has created complex fare rules and fare barriers that discourage transit riders from using multiple transit systems.



One barrier is that transit users travelling to or from Toronto—including 48,000 people each weekday morning who use the TTC for part of their trip—generally pay two fares to transfer between the TTC and adjacent transit systems.⁵⁴ This may lead people to drive to a transit station across the boundary to avoid paying two fares, or to avoid using transit altogether. For low-income residents who depend on transit the double fare can challenge the affordability of transit use, effectively reducing their access to educational or employment opportunities.

Another barrier is that fares can differ for services that cover the same basic route. For example, GO base fares are significantly higher than the fares for local transit services in the same corridor (e.g., Kipling to Union). Also, there are differences among the loyalty programs and passes offered by different transit agencies, each of which has its own unique way of encouraging and rewarding frequent ridership.

Further fare and service integration will require approaches to collaboration, decision-making and funding that balance regional coordination and local autonomy and ensure that the needs of low-income users are addressed. Transit is critical to the mobility of people with limited income, and equitable transit access and transit affordability will need to be key considerations in any GTHA fare strategy. A more formal process that engages all GTHA transit agencies in these issues is required to create a completely integrated transportation system.

Plan for the first- and last-mile

New rapid transit projects across the GTHA will bring quality transit services closer to many more people and jobs. Maximizing the use of these new services will require a renewed emphasis on providing multimodal options for the first- and last-mile of every passenger trip. It is not sustainable to rely primarily on rapid transit users driving to stations and parking for free. New solutions are needed.

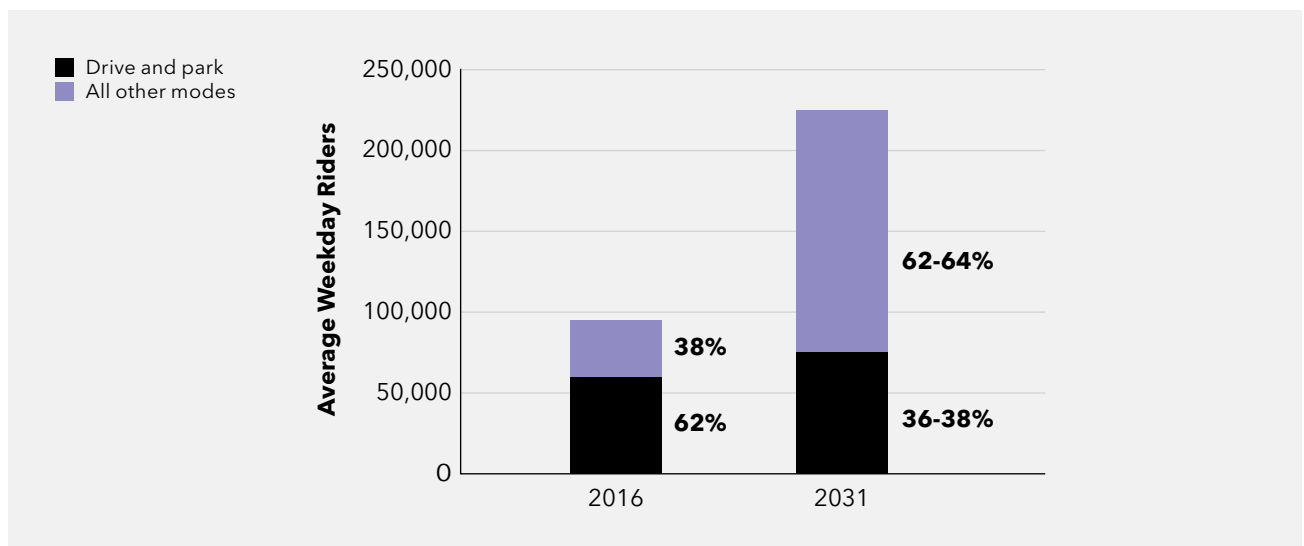
The TTC is well known for its comprehensive system of bus and streetcar routes that connect to the subway system. Similarly, local transit routes across the region can connect to the Frequent Rapid Transit Network. The 2016 *GO Rail Station Access Plan* set targets for reducing the proportion of people who access GO stations by automobile. Figure 23 shows the anticipated growth in GO rail ridership to 2031 with the implementation of GO RER, and the substantial increase in the percentage of trips that access GO stations by local transit, carpooling and active transportation (from 38% to 62% of all trips) that will be needed to serve GO ridership growth, in view of constraints on parking supply.

The *GO Rail Station Access Plan* also gives direction on improving multimodal connections from GO stations to key destinations using travel options such as conventional and micro-transit services, carpooling, walking and cycling. The Access Plan focuses on improving customer access to platforms, not just stations, and prioritizes access by local transit services over access by single-occupant vehicles. Similar approaches will be needed at other GTHA rapid transit stations and carpool parking lots to ensure easy access to regional and rapid transit by all modes. A highly collaborative, region-wide approach to first- and last-mile travel is needed to offer an attractive and effective range of options.

Milton tackles the first- and last-mile

For the cost of a standard local transit fare, Milton's Evening GO Drop-Off provides a flexible shuttle service for riders arriving in Milton on the GO train in the evening. In 2017, the service was provided to over 6,000 riders.

Figure 23: Shift in GO station access mode required to accommodate growth in GO rail trips to 2031



Source: Metrolinx, *GO Rail Station Access Plan*, 2016.



Focus on the traveller experience

Creating a quality traveller experience is central to the 2041 RTP, and more must be done to improve the experience of transit users. Services should be reliable and on time, fares and routes should be easy to navigate, and real-time travel information as well as payment and self-serve options need to be expanded. Acknowledging the fact that transit journeys are door-to-door trips that involve multiple modes and often cross municipal boundaries will help the region progress toward seamless integration. Traveller safety and convenience should remain at the centre of all decisions.

Strategy 3 recommends development of a mobility as a service (MaaS) system. MaaS offers travellers a suite of travel options (e.g., transit, car-share, bike-share and taxi) from different providers through a single app. An integrated system could include trip planning and payments, possibly on a subscription basis. Metrolinx can play a leadership role in enabling or coordinating the activities of service providers—public and private, conventional and emerging—as they work together to develop MaaS solutions that meet the diverse needs of individual customers.⁵⁵

Going mobile

In 2016, Burlington Transit launched a mobile-friendly website, complete with real-time bus data. Travellers can now use their mobile phone to view a live map that shows the exact location of their bus.

Integrated mobility through a single app

'Whim', a MaaS solution, was launched in Helsinki in 2016 and provides customers with access to public transportation and taxis using a mobile app. Users find routes, fees, tickets, timetables, booking and travel options in one place.

Source: <http://maas.global/>



Durham Region's focus on accessibility

Durham Region Transit's bus fleet became 100% accessible in 2014. By the same year more than 75% of previously inaccessible bus stops had been paved, making it easier for all transit users to get on board.

Provide universal access

Transit plays a critical role in giving people affordable access to employment opportunities, health care, education, recreation, shopping and other needs. Universal and barrier-free access is required under the *Accessibility for Ontarians with Disabilities Act, 2005* and is a core component of an integrated regional transportation network that offers both conventional and paratransit services.

Ensuring that transit is designed to be age-friendly, taking into consideration the needs of both younger and older travellers, is important for community building and to make the transit system usable for all. Emerging technologies and the quality of design for universal access are levers to optimize benefits for all transit users. Universal access principles will help the GTHA's transportation system support and encourage travellers with diverse abilities.

Embed design excellence in transportation planning

Metrolinx routinely incorporates design excellence concepts in architecture, urban design and landscape architecture in the development of its transit projects (e.g., the Eglinton Crosstown LRT), and has also integrated public art.

Design excellence goes beyond visuals to actually knit the built fabric together. It incorporates everything from universal signage and wayfinding that help travellers find their way, to providing cross-platform transfers so travellers do not have to negotiate stairs. If it is incorporated into planning from the outset, supported throughout and done properly, there is no cost premium to improving the look and feel of transit. Improving the quality of design in the GTHA's transportation system can help deliver a more comfortable, pleasing and seamless traveller experience that will make transit the preferred mode for more people.

Keep safety a priority

While the GTHA's transportation system remains one of the safest in North America, too many serious injuries and fatalities occur each year, particularly among vulnerable users (children, older adults, pedestrians and cyclists).⁵⁶ Many of these are preventable. Educating all road users, providing protected bike lanes, setting lower speed limits on roads and designing streets for all users can all improve safety.

Ontario is a leader in developing road safety laws, programs and standards. Recent legislation (e.g., the *Safer School Zones Act, 2017* and the *Making Ontario's Roads Safer Act, 2015*) has:

- increased penalties in the areas of impaired driving, distracted driving, and cyclist and pedestrian safety;
- helped municipalities target unsafe drivers and protect children, seniors, other pedestrians and cyclists; and
- given municipalities more tools to fight speeding and dangerous driving.

Across Canada and internationally, many jurisdictions have taken a systems approach to reducing injuries and fatalities from transportation. 'Vision Zero' is a multi-pronged strategy that involves transportation planners and engineers, public health services, police, community groups and others working together to eliminate fatalities and serious injuries. Vision Zero asks stakeholders to examine how they work together, and emphasizes that although road design is at the core of safer streets, it is also important to work towards safer speeds, vehicles and operating practices (see Figure 24).

Today in the GTHA, data on fatalities and serious injuries from transportation are not systematically collected or analyzed at a regional level. Safety programs are typically fragmented, limiting their reach and effectiveness. Prevention requires a spectrum of interconnected strategies to change policies and practices, educate providers, increase collaboration, and enhance individual knowledge.

This plan recommends incorporating the Vision Zero framework into the planning and operation of the GTHA's transportation system. This broad, multi-stakeholder approach to transportation safety can yield significant improvements in both transportation safety and travellers' perceptions of it.

Figure 24: Vision Zero principles

Vision Zero

Vision Zero is a concept invented in Sweden whereby governments aim to reduce transportation fatalities to zero.

It takes a system-wide approach to address all factors that lead to fatalities by focusing on both preventing collisions through a combination of prevention programs and good design, and ensuring that any accidents that do occur are not fatal through design and regulatory standards.

Several governments at all levels have adopted Vision Zero strategies, including the City of Toronto.

Principles

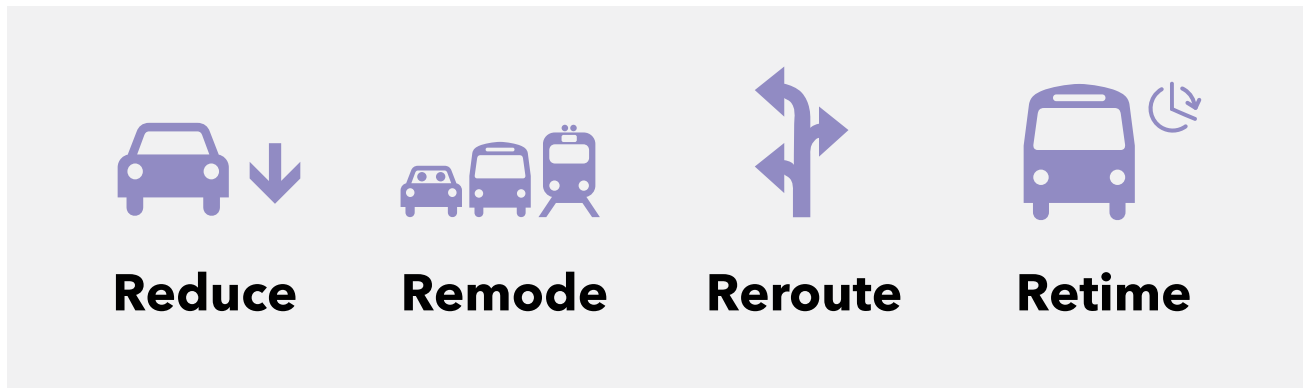
- No loss of life is acceptable.
- Traffic fatalities and serious injuries are preventable.
- We all make mistakes.
- We are physically vulnerable when involved in motor vehicle collisions.
- Eliminating fatalities and serious injuries is a shared responsibility between road users and those who design and maintain our roadways.

Perspectives on safety

A safe regional transportation system takes a comprehensive approach to safety: people are safe, goods are secure, and equipment is well-maintained. Safety also means that everybody can trust, access and use the system without feeling vulnerable.

Final Report of the Residents' Reference Panel on the Regional Transportation Plan

Figure 25: The concept of TDM



Shaping travel choices through MyTrip

MyTrip is a TDM pilot program in York Region. It encourages residents in six newly developed neighbourhoods to make sustainable travel choices including transit, cycling and walking.

Reinvent transportation demand management

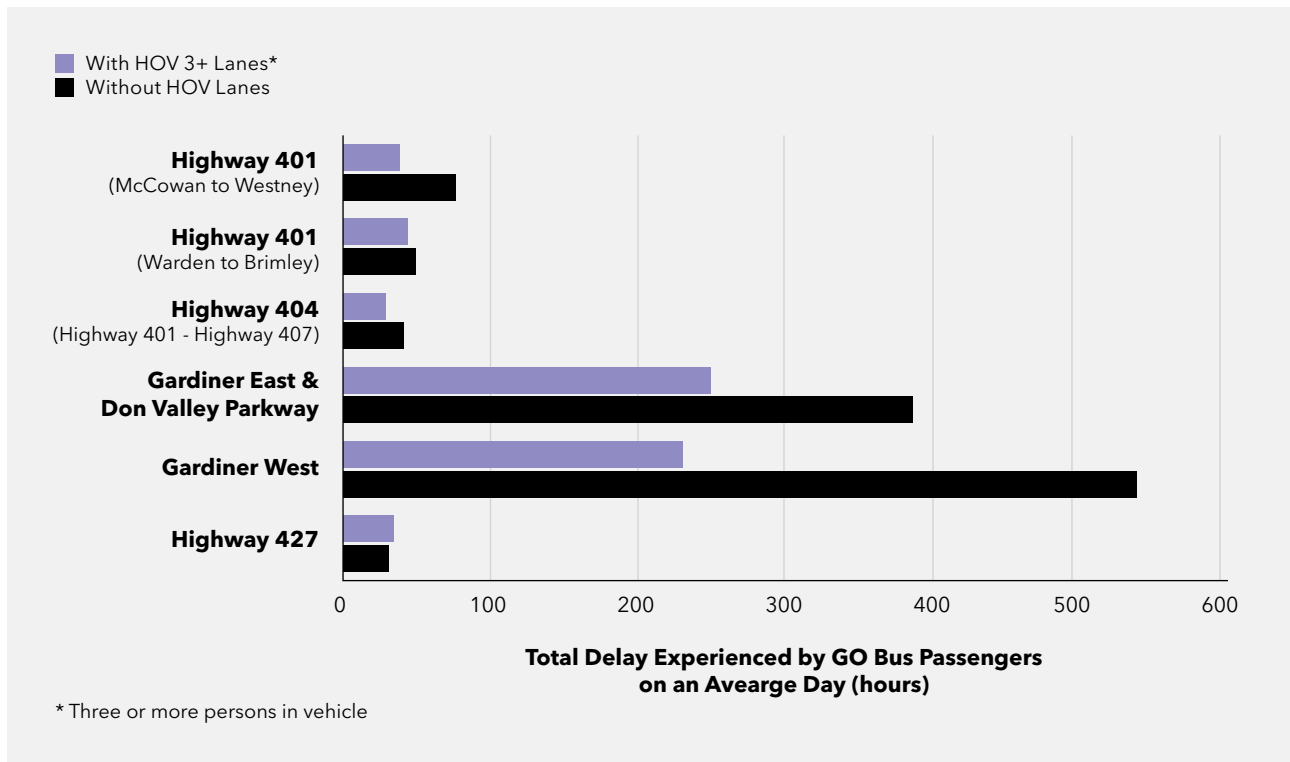
TDM strategies are key to unlocking the benefits of new investments in transportation infrastructure and services, and to making the best use of the transportation system's available capacity. TDM uses a variety of tools including carpooling and vanpooling, HOV lanes, telework and park-and-ride (see Figure 25). It provides a high return on investment, and also supports environmental and health objectives.⁵⁷

The Metrolinx Smart Commute program has expanded to engage more than 300 employers with TDM initiatives such as carpool ridematching, discounted transit passes, active transportation promotion, and telework arrangements. TDM strategies are also being incorporated into municipal policies and plans.

There is an opportunity to apply new region-wide TDM approaches and technologies, and to create innovative partnerships with third-party mobility service providers and technology companies. Jurisdictions such as the San Francisco Bay Area, London (UK) and Paris (France) have achieved significant results with TDM tools such as differential peak/off-peak transit fares, parking charges, HOV lanes and mandatory workplace programs for large employers.⁵⁸ Some municipalities in the GTHA now require TDM plans as part of the development approval process, to ensure that new developments support non-driving travel options.

This plan recommends several actions to make TDM programs more attractive and effective.

Figure 26: GO bus passenger time savings from HOV lanes during 2015 Pan Am Games



Source: Metrolinx GO Planning.

Expand the HOV lane network

This plan recommends an extensive network of HOV lanes on 400-series highways, as well as on the Gardiner Expressway, Don Valley Parkway and other major highways, giving priority to vehicles with more than one occupant. The GTHA's recent experience with HOV lanes during the 2015 Pan Am/Pan Parapan Games demonstrated a clear benefit in reducing delay for GO bus riders, leading to a more reliable and attractive service (see Figure 26).

A regional approach to HOV lanes or other managed lanes will encourage carpooling and transit use, support faster and more reliable bus service, and help make solo driving less attractive. As discussed in Strategy 2, Frequent Regional Express Bus routes would run largely in HOV lanes on 400-series highways to maintain fast, reliable service. A managed lane network for 400-series highways will be determined by MTO, in consultation with Metrolinx, as part of the *GGH Transportation Plan*. Many municipalities in the GTHA operate HOV lanes on arterial roads or have included them in their TMPs, which can provide significant benefits to transit riders and carpoolers.

HOV lanes can be created from existing highway lanes or lanes on arterial roads, and do not necessarily require road widening. They are also flexible, and could be used in the future for autonomous shuttles or other shared services. In locations where HOV lanes have residual capacity, it may be appropriate to introduce high-occupancy toll (HOT) lanes and allow single-occupant vehicles to pay a fee for using a managed lane otherwise reserved for buses and carpoolers. MTO has recently initiated a HOT lane pilot program on the Queen Elizabeth Way that will inform long-term HOT lane planning, including dedicated HOT lanes with electronic tolling on part of Highway 427. Tolling can also be expanded more broadly to include some form of charging on all roads (e.g., paying a fee for each kilometre driven). Although road tolls or vehicle charges for all kilometres travelled can deliver a reduction in congestion, they remain one of the most challenging mechanisms for all decision-makers, because of their high profile, unpopularity with drivers, and questions about fairness.

Manage roads and highways to support transit

The Province and GTHA municipalities have made some progress in managing roads and highways to support transit by expanding the network of HOV lanes on highways and arterial roads. The reliability and speed of bus service in mixed-traffic environments can be improved further by using ITS technologies and data.

Existing ITS systems across the GTHA are fragmented, and the 2041 RTP presents an opportunity to strategically plan, deploy, integrate and operate transportation systems management, which encompasses ITS, for traffic management and the implementation of the Frequent Rapid Transit Network and Priority Bus corridors. 'Smart corridors' that integrate a number of different ITS components could employ a range of ITS tools, depending on the context, as shown in Figure 27.⁵⁹

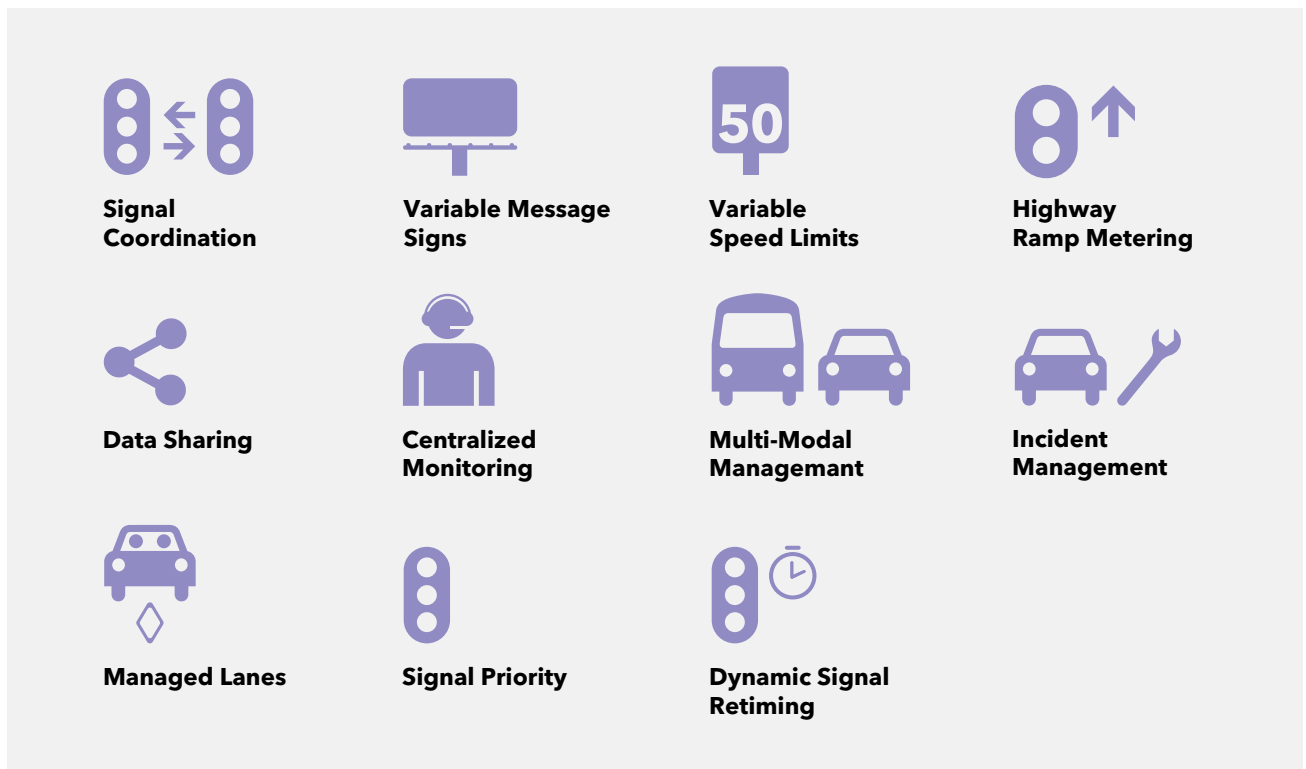
In general, there is considerable room for improved collaboration among provincial and municipal agencies in charge of roads, signals, parking, taxis and transit to create a system of roads and highways that is more efficient and focused on moving transit, pedestrians, cyclists, and freight, not just automobiles.⁶⁰

Optimize highway, major road and rail networks for goods movement

The efficient movement of goods and services in the GTHA is essential to the region's economic prosperity and quality of life—a fact sometimes not recognized by the general public. A staggering amount of goods (with an estimated value of \$3.5 billion) is moved by rail and truck in the GTHA every day.⁶¹ Regional goods movement activity is expected to grow by about 35% between 2016 and 2041.⁶²

In a multimodal transportation system, it is essential to identify how to move people and goods effectively using shared infrastructure. Optimizing the highway and major road network for goods movement will support the efficient, reliable and safe movement of trucks, while reducing costs and environmental impacts. This optimization requires an understanding of where freight is moving to and from, and the nature of goods being shipped. Providing reliable connections for trucks and other modes to access intermodal yards and freight clusters—areas with high concentrations of land uses related to logistics, warehousing and the movement of cargo—will help ensure that goods move efficiently throughout the region.

Figure 27: Potential Intelligent Transportation Systems (ITS) tools





Innovative freight strategies (e.g., creating urban freight hubs, using transit stations as pick-up locations for small parcels, or moving freight outside peak periods) could reduce the need for and impacts of door-to-door delivery in urban cores.⁶³ Bicycle delivery could reduce the environmental impact of delivery vehicles, including noise and air pollution.⁶⁴ Taken together, these measures can help reduce conflicts with other vehicles while maintaining the region's economic competitiveness.

Strategy 3 recommends collaboration between the public and private sectors to develop a regional Strategic Goods Movement Network (SGMN), as well as other actions to enhance the movement of goods (see Figure 28 and Map 8). The MTO and several partners, notably the Region of Peel, have done significant work in the area of goods movement. In 2016, MTO released its *Freight-Supportive Guidelines* to help municipalities understand, support and plan for freight movement. The Province is now developing a goods movement network as part of the *GGH Transportation Plan*. The Regional Strategic Goods Movement Network will inform the development of a GGH goods movement network.

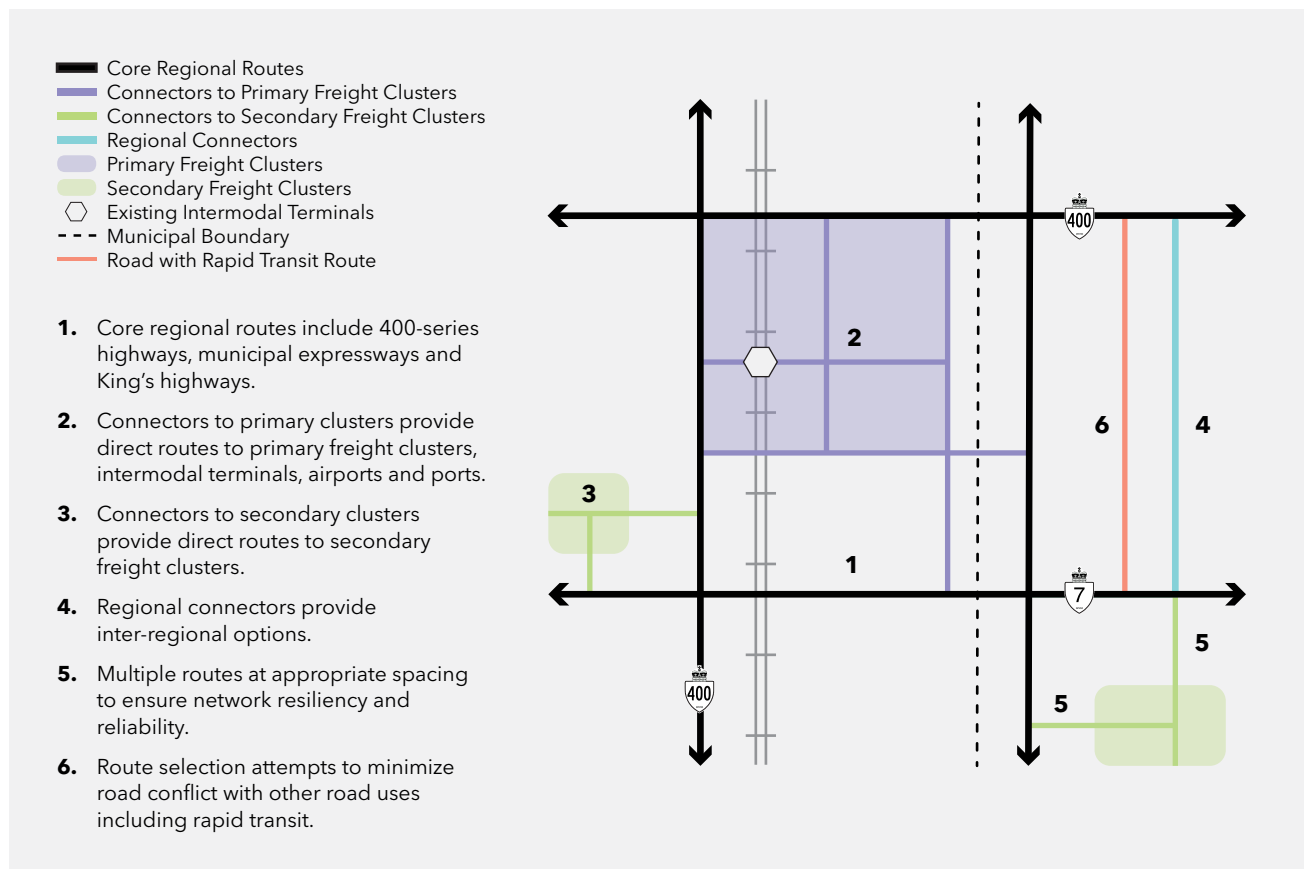
With the GTHA experiencing sustained rapid growth, the region's rail corridors also are experiencing increased demand for both freight and passenger movement. As the Province and Metrolinx continue to increase GO rail service, planning must consider long-term rail needs and opportunities including the separation of passenger and freight rail services on existing and future rail corridors. The need to examine the separation of rail services, particularly on segments of the GO rail network not in public ownership, is due not only to increasing passenger and freight rail volumes, but also to potential challenges in operating different types of trains in a single corridor after electrification.

Proceeding with freight rationalization will entail close cooperation among all levels of government and private freight rail operators, as well as community consultation. MTO's *GGH Transportation Plan* will consider a number of issues to enhance freight movement including freight rationalization, particularly if additional rail infrastructure is required.

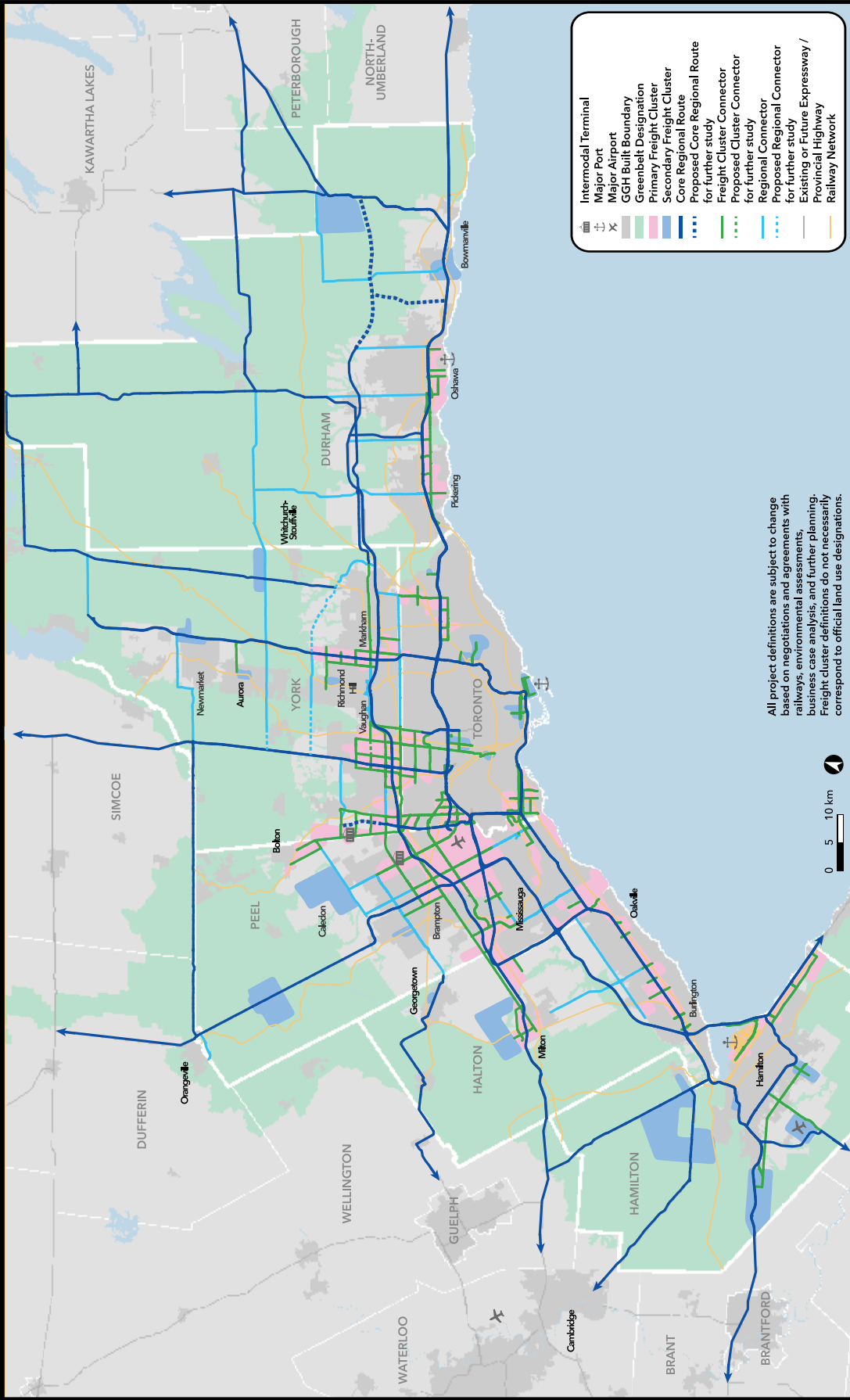
The Region of Peel: A leader on goods movement

The Region of Peel's Goods Movement Strategic Plan was updated in 2017 with nine new actions to encourage the efficient transportation of goods within the region. The plan is supported by Peel's Goods Movement Task Force, a public-private group that meets regularly to advance efficiency, competitiveness and sustainability in the region.

Figure 28: Key principles of the regional Strategic Goods Movement Network



Map 8: Regional Goods Movement Network for roads and highways



Priority Actions for Strategy 3

3.1

Advance the integration of transit services and fares:

- Remove barriers to create an integrated fare system that supports seamless and consistent travel for passengers across municipal boundaries.
- Ensure progress toward seamless travel and increase ridership by taking a regional view of setting fares and concessions for transit, and by developing innovative fare products.

3.2

Expand first- and last-mile choices at all transit stations:

- Fully implement the *GO Rail Station Access Plan (2016)* to achieve higher shares of station access by walking, cycling, transit, passenger pick-up and drop-off, and carpooling.
- Invest in first- and last-mile solutions to maximize all-season access to and from all rapid transit stations, including but not limited to:
 - priority transit access;
 - pedestrian access to workplaces and destinations;
 - improved on-demand services including taxis and micro-transit services (with potential applications in rural areas);
 - on- and off-site bicycle facilities; and

- car-share and bike-share programs.
- Recover the cost of providing parking at GO stations to help shift trips to modes that do not require parking, and to allow more people to access new train services.

3.3

Set consistent high-quality standards for the traveller experience:

- Focus on reliable service as a first priority for attracting customers to transit, emphasizing the use of transit priority measures.
- Provide travellers with:
 - real-time information;
 - well-designed places that offer shade, shelter, paved surfaces, seating, clear sightlines and lighting;
 - consistent wayfinding across modes;
 - all-season maintenance of sidewalks, bike lanes and paths;
 - on-demand service connectivity; and
 - concession fares.
- Develop and implement shared customer experience objectives for new regional transit investments and the regional transit network in general.

- Ensure that design excellence is applied to architecture, urban design and landscape architecture.

3.4

Develop and implement a mobility as a service strategy:

- Continually improve the PRESTO fare payment system to support inter-municipal transit trips with a range of fare products and self-service options. Migration to an account-based system will allow customers to access PRESTO via traditional PRESTO cards, credit cards, limited use electronic tickets and mobile wallets.
- Fully integrate regional multimodal trip planning and fare payment into a MaaS platform, incorporating and encouraging mobility options including but not limited to transit, bike-sharing, car-sharing, carpooling and ride-sourcing.

3.5

Place universal access at the centre of all transportation planning and designing activities:

- Foster an accessible network of conventional transit and paratransit systems, where riders can transfer easily and conveniently between services, including across boundaries.
- Develop an integrated regional booking platform for specialized transit trips across the region.
- Ensure that on-demand services meet the needs of a diverse range of travellers.
- Provide leadership and ensure consistency in accessible design for transportation services and facilities across the region, with a focus on ensuring that transportation services and facilities are age-friendly and can be used by all residents of the GTHA.
- Collaborate to address challenges to transit access, and the unintended consequences of transit investment such as increases in housing costs along transit corridors.
- Develop a regional framework for the universal provision of transit passes to low-income groups.

3.6

Eliminate transportation fatalities and serious injuries as part of a regional Vision Zero program.

- Incorporate the Vision Zero framework into regional transportation planning by developing an approach to transportation design standards, speed limits and public education with the aim of zero fatalities and serious injuries from transportation.

3.7

Make TDM a priority:

- Collaborate to develop and implement TDM programs as required by the *Growth Plan*.
- Advance workplace TDM programming and encourage private-sector leadership, participation and investment with mandated participation by large employers, institutions and other venues that generate a significant number of trips.
- Develop new approaches to TDM delivery from the fields of service design and behavioural economics.
- Reinvigorate carpooling with a compelling and user-friendly online regional platform integrated with trip planning and payment tools, and drive participation, including removing regulatory obstacles to user incentives.
- Deliver TDM programming to support all new rapid transit services, transit station areas, and areas impacted by major construction and events.
- Develop incentives for off-peak travel to reduce peak travel demands and, in the case of transit, to grow off-peak ridership.

- Continue to explore how mobility pricing (e.g., parking, road pricing, HOT lanes and off-peak fares) could be used to shift travel behaviour.
- Assess the feasibility and potential of vanpool services.

3.8

Expand the current HOV lane network:

- Identify and prioritize a seamless network of HOV lanes on the highways in the GTHA, encouraging higher-occupancy vehicle travel and supporting faster, more reliable bus service (see Map 7).
- Incentivize ridesharing using the HOV lane network for trips that are difficult to make by transit or active transportation.
- Identify opportunities to implement HOV lanes on arterial roads to support the Frequent Rapid Transit Network.
- Continue the implementation of HOT lanes on HOV lanes that have excess capacity.

3.9

Further integrate road and transit planning operations:

- Invest in the regional coordination and deployment of ITS and smart corridors to support effective congestion management and transit priority operations.
- Coordinate the planning and operation of transit, roads and on-street parking within each municipality, across municipal boundaries, and where municipal, regional and provincial roads meet.

3.10

Define and support a regional goods movement system:

- Advance collaboration between the public and private sector to implement a Regional Strategic Goods Movement Network (see Map 8) that links goods-generating activity centres, intermodal terminals and regional gateways.
- Study goods movement priority features for new and existing freight corridors, including but not limited to intelligent lane utilization and truck-only lanes.
- Support development of innovative freight hubs, including planning for and protecting complementary land uses. Consider the use of transit stations as a pick-up location for small parcels, and support other innovative urban freight practices to reduce door-to-door delivery. Explore and implement flexible freight delivery times, including off-peak delivery, where applicable.
- Establish a GTHA urban freight monitoring program, including the ongoing collection of freight data.
- Expand awareness and education efforts regarding goods movement planning, design and operational issues, with particular reference to e-commerce impacts and potential delivery innovations (e.g., bicycle use) on the volume and nature of freight movement in the region.

3.11

Promote integrated planning for rail corridors:

- Coordinate with MTO in its investigation of the potential for shared freight and passenger use of critical rail corridors in the GTHA.
- Where corridor capacity studies indicate separation of uses is required, develop and promote plans for freight rationalization.
- Ensure that community safety is given high priority in planning for goods movement on rail corridors.

Strategy 4

Integrate transportation and land use



Transportation decisions affect land use, and how we plan and design our region has an impact on transportation systems. As the GTHA and its transportation system expand, there is a great opportunity to create more complete, connected, healthy and sustainable communities by reducing automobile dependence, improving access to services and amenities, and supporting transit and active transportation.

More than \$30 billion in transit investments arising from *The Big Move* will deliver more rapid and frequent transit service across the region over the next decade. These investments support the *Growth Plan's* vision for intensification and complete communities, and its policies for transportation planning. The *Growth Plan* uses strong language to describe the importance of integrating land use and infrastructure planning, and the need for intensification at rapid transit stations, connected urban centres, increased transportation choice, and efficient goods movement. Implementation of the 2041 RTP is a chance for Metrolinx to work with municipalities in support of the *Growth Plan*, especially through planning for Major Transit Station Areas and employment areas, the development of complete streets, and the use of innovative approaches to parking and TDM.

Intensify and integrate development at Major Transit Station Areas

Transit stations link people to jobs, schools and amenities, and their close integration with commercial, residential and office uses is an essential approach to station development or redevelopment. Several examples of integrated development can be found along the Yonge Subway corridor, but other examples have been slow to appear in the GTHA. Experience over the last decade has highlighted the need for greater consideration of development objectives in transit project planning and procurement, and for clearer delineation of the roles and responsibilities of public and private parties in optimizing the potential of critical station locations. Metrolinx can play a leadership role in ensuring that development and redevelopment around stations meets the objectives of the *Growth Plan* and the 2041 RTP.



Sufficient land use density at stations is important to ensure significant two-way, all-day ridership on GO RER. The *Growth Plan* prioritizes planning and sets density targets for development for stations on Priority Transit Corridors—corridors where investments in frequent rapid transit are committed. The *Growth Plan* requires the design of Major Transit Station Areas to feature transit-supportive densities and multimodal access options that focus on walking, cycling and transit. Major Transit Station Areas can be attractive locations for new employment, public institutions and regionally significant services, as well as prime opportunities for collaboration by public and private sectors to create transit-oriented developments that enhance transit service.

In 2016, when Metrolinx approved advancing new stations on four corridors for GO RER and SmartTrack, it requested that “municipalities where these recommended new stations are located provide resolutions... demonstrating their commitment to implementing transit-supportive land uses around stations, and sustainable station access”. This approach could be a model for future investment in transit stations.

Create a system of connected Mobility Hubs

Mobility Hubs were introduced in *The Big Move* and remain an important planning concept. They are Major Transit Station Areas at key intersection points on the Frequent Rapid Transit Network. Mobility Hubs are intended to create important transit network connections, integrate various modes of transportation and accommodate an intensive concentration of places to live, work, shop or play. They are particularly significant because of their combination of existing or planned frequent rapid transit service with an elevated development potential.

Map 3 shows Mobility Hubs on Priority Transit Corridors and subway lines.



Oakville plans for a vibrant Mobility Hub

The Town of Oakville has prepared a Midtown Oakville Strategy to support the transformation of the Mobility Hub into a “vibrant and vertical” urban centre for people to live and work. The strategy includes an environmental assessment, a parking strategy and urban design guidelines. It re-imagines this Mobility Hub as a mixed-use, transit-oriented community at one of the busiest GO stations on the network.

Since 2009, 43 of the 51 Mobility Hubs identified in *The Big Move* have experienced residential and employment growth, with the median growth rate of each Mobility Hub approximately double that of the region’s overall growth. However, progress toward the support of transit in the region’s Mobility Hubs varies greatly in terms of density, form, function and rapid transit phasing. With the continued expansion of the region’s Frequent Rapid Transit Network, Mobility Hubs present a vital opportunity to maximize the benefits of transit investments, establish a well-connected regional transit network, and foster transit-oriented development through collaboration by public and private sectors.

Metrolinx’s *Mobility Hub Guidelines* (2011) are a tool for all parties to address the existing and anticipated opportunities and challenges of integrating transportation and development functions at these important locations. The *Mobility Hub Guidelines* will be updated to reflect new provincial policy and the 2041 RTP.

Coordinate RTP with municipal land use plans

Metrolinx provides occasional input to the Province’s review of the official plans of upper- and single-tier municipalities through the Province’s One Window process, which is a formal mechanism for reviewing municipal plans. Metrolinx can also ask to review planning applications submitted to municipalities and other planning documents (e.g., secondary plans and zoning by-law amendments), but there is no formal mechanism to guide this process and for Metrolinx to advise on alignment with the RTP. Strategy 4 recommends development of such a process.

Encourage walking and cycling through better design

Making walking and cycling safe and accessible is a cornerstone of complete communities and the *Growth Plan's* goals for intensification. While 22% of trips in today's GTHA are short enough to be made by walking and 56% of trips are short enough to be cycled,⁶⁵ only 11% of trips are actually made on foot or by bike.

Walking and cycling activity is highly dependent on density, built form, supportive infrastructure, and users' perceptions of attractiveness, convenience and safety. In Toronto, for example, the share of trips that start and end in the downtown area made by walking and cycling is more than 50%, and has grown significantly in the last decade.

Many areas in the GTHA are not conducive to walking, particularly suburban employment areas and some post-war residential neighbourhoods. While many destinations and jobs are located within walking distance of frequent transit, walking is deterred by the absence of sidewalks that are continuous, well maintained and well lit. These barriers are even more profound for elderly persons or those with mobility restrictions. To encourage walking from transit stops, buildings should be located close to the road with quality pedestrian routes leading to the entrance. The street network should provide as many direct routing options as possible. Figure 29 shows a neighbourhood street network that has been reconfigured from an auto-oriented design to be more pedestrian-friendly.

Making it easy to walk

With the construction of a fully enclosed pedestrian bridge across a 14-lane section of Highway 401, pedestrians can now walk easily from the Pickering GO station to new office development in the City Centre.

The 2041 RTP includes a number of actions to significantly increase walking and cycling trips. Investments to support active transportation are relatively small compared to those for rapid transit and highways, but their congestion, health and safety impacts can be significant. For example, better all-season maintenance of sidewalks near rapid transit stations can make walking a more viable option for transit users living nearby, and reduce the need for costly station parking.

A complete streets approach that prioritizes walking and cycling in the design and operation of roads and new surface transit corridors will promote healthier and safer forms of travel. Complete streets principles are intended to make pedestrians, cyclists and transit users of all ages safe and comfortable.⁶⁶ Supporting measures can include traffic calming, safe and convenient pedestrian linkages to transit, and improved bicycle amenities.

Figure 29: Street network before and after pedestrian-friendly redesign



Source: Adapted from the City of Toronto Six Points Interchange Reconfiguration Project.



Develop a Regional Cycling Network

The many barriers to bicycle commuting in the GTHA include a lack of safe bike lanes, discontinuous cycling networks, physical barriers such as highways, and the built form of many areas. Cycling infrastructure can help overcome these barriers, and can be developed at a relatively low cost with a high return on investment. Strategy 4 recommends the development of a Regional Cycling Network to provide a cohesive network of regional corridors and local routes that facilitate commuter cycling.

Developing a GTHA commuter cycling network supports the goals of *CycleON: Ontario's Cycling Strategy* and *Ontario's Climate Change Action Plan*. The Province is committed to helping create better cycling networks, more cycling facilities in urban areas and more bike parking at transit stations and provincially-owned public facilities. Through the Ontario Municipal Commuter Cycling Program, starting in 2017-18, the Province is providing direct funding to municipalities from cap-and-trade proceeds to support the development of commuter cycling infrastructure.

The focus of the Regional Cycling Network is to provide cycling commuters with more bike lanes, separated bike lanes or cycle tracks in heavily travelled corridors, especially across municipal boundaries and for longer trips. Its success will require the Province and municipalities to establish common design standards and supporting funding.⁶⁷ The Regional Cycling Network acts as a spine that links local routes and facilities. It will:

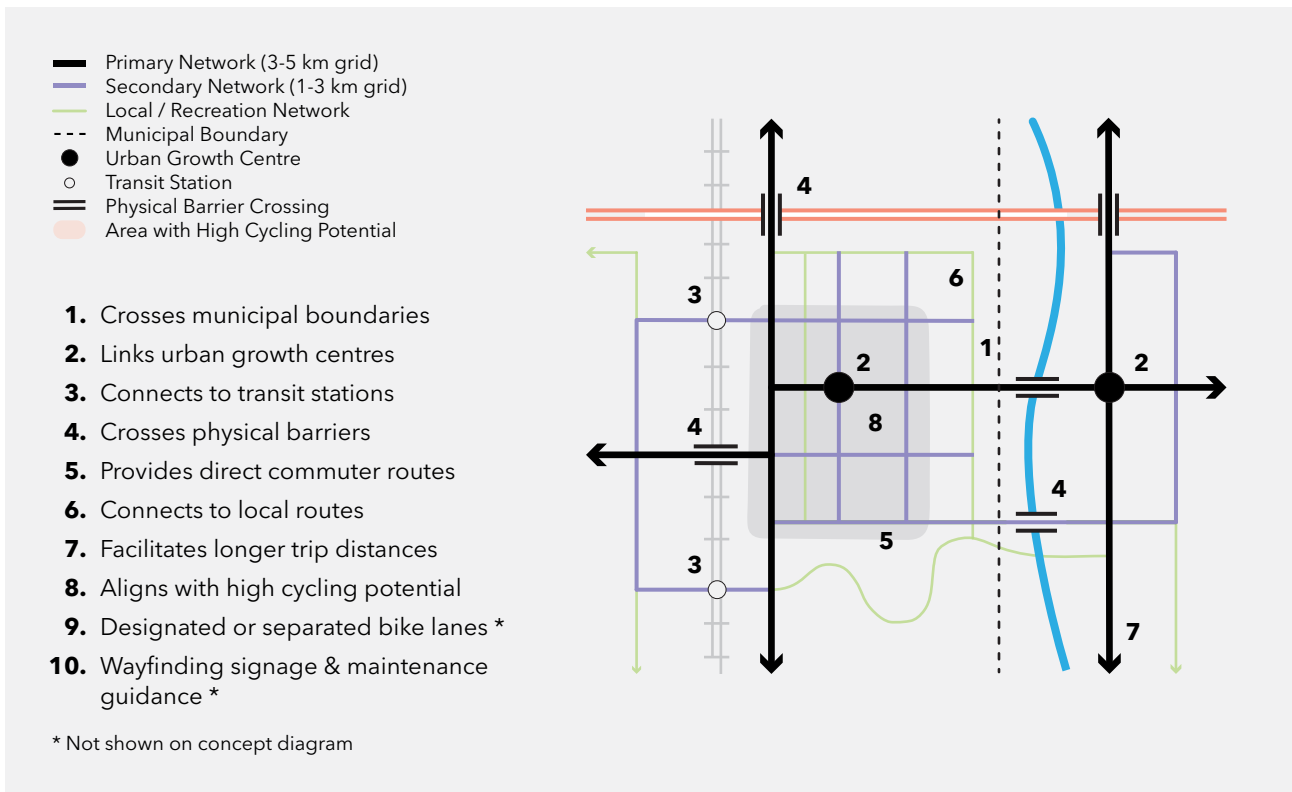
- bring cycling facilities closer to more people;
- cross municipal boundaries; and
- connect transit stations, Urban Growth Centres and other regional destinations (e.g., universities).

When complete, the Regional Cycling Network will provide:

- paved riding surfaces;
- bike lanes, separated bike lanes or cycle tracks where speeds or traffic volumes are higher;⁶⁸
- clear and consistent wayfinding signage; and
- routes that are direct and help users cross physical barriers such as waterways and 400-series highways.

Figure 30 identifies the key principles of the Regional Cycling Network, and Map 9 shows the proposed network.

Figure 30: Key principles of the Regional Cycling Network



Address parking management in land use planning

Free or inexpensive parking encourages driving, even when quality travel alternatives exist. Excessive parking is often mandated by zoning by-laws, making development more expensive than necessary. Although *The Big Move* recommended updates to municipal parking requirements, there has been inconsistent progress across the GTHA. A comprehensive approach to applying best practices in parking management is even more necessary today, because on-demand services and autonomous vehicles are likely to change the demand for off-street parking as well as on-street parking, especially the need for loading areas where vehicles can pick up or drop off passengers.

Through secondary plans, zoning by-laws and development applications, the land use planning process can help minimize parking demands by ensuring that residential and commercial sites support walking, cycling, car-sharing and transit use. Strategy 4 recommends actions to manage both parking supply and demand through the land use planning process. Parking management can also apply to transit stations, such as by setting a maximum number of parking spaces to be built at new stations.

The 2041 RTP presents an opportunity to make parking management a regional priority, and to support development of parking standards, guidelines and supply forecasts that municipalities can use in planning and regulating off-street parking. Parking standards and guidelines could be regionally coordinated, but should remain sensitive to the context and characteristics of different locations. Parking policies should coordinate off-street parking supply with transit expansion, support other alternatives to driving, recognize the need for deliveries and passenger pick-up and drop-off, and encourage innovations such as car-sharing and dynamic parking pricing.

Approaches that could be quickly implemented across the region include shared parking, unbundled parking for multi-family housing, the provision of bike parking and preferential parking spaces for car-sharing, electric vehicles and carpools; some of these initiatives support *Growth Plan* policies relating to intensification and Major Transit Station Areas. Other parking strategies could reduce environmental impacts through innovative parking facility design and approaches to reducing heat islands, stormwater run-off and salt use.

Encourage students to walk and cycle to school

School-related trips account for 20% of travel by GTHA residents in the morning peak period. The proportion of students driving or being driven to school has more than doubled since 1986 while active travel to school has steadily declined, contributing to traffic congestion, physical inactivity and developmental impacts.⁶⁹ Government and community organizations have been working to reverse these trends through the School Travel Planning and Active and Safe Routes to School programs, coordinated regional campaigns, research, education and training programs and facility improvements.

In addition to improving the built environment to support walking and cycling, and developing the Regional Cycling Network, Strategy 4 contains specific actions to advance active and sustainable school travel, with the goal of 60% of students walking or cycling to school. Success will improve public health, safety and the environment, and will help today's children and youth to become tomorrow's adult pedestrians, cyclists and transit users.

Assess the need for a Transportation Planning Policy Statement

The 2041 RTP and municipal land use decisions must be consistent with the *Provincial Policy Statement (PPS)* and conform to the Province's *Growth Plan*—a requirement that ensures major transit investments and new developments support the provincial vision for growth. However, municipalities are not required to align their municipal transportation plans with the 2041 RTP. While some progress has been made through collaboration, the transportation and land use decisions made by the Province, municipalities and developers need to be better coordinated to fully achieve the GTHA's vision for growth.

The *Metrolinx Act, 2006* enables the Minister of Transportation to develop a Transportation Planning Policy Statement (TPPS) that could provide more specific transportation policy direction than the *Growth Plan*. A TPPS could support the implementation of the RTP by including additional policy detail on how municipal Transportation Master Plans should address parking, road design, station access, transit service planning and Mobility Hub development among other issues. It would support closer alignment between transportation and land use in the region and further the goals of the *PPS* and the *Growth Plan*.



Hamilton gets moving on two wheels

Implementation of the City of Hamilton's Cycling Master Plan has been proceeding on several fronts. Among its successes are the 3-km Cannon Street cycle track that opened in 2014, and the Hamilton Bike Share program that offers a fleet of 825 bikes at 130 docking stations across the city.

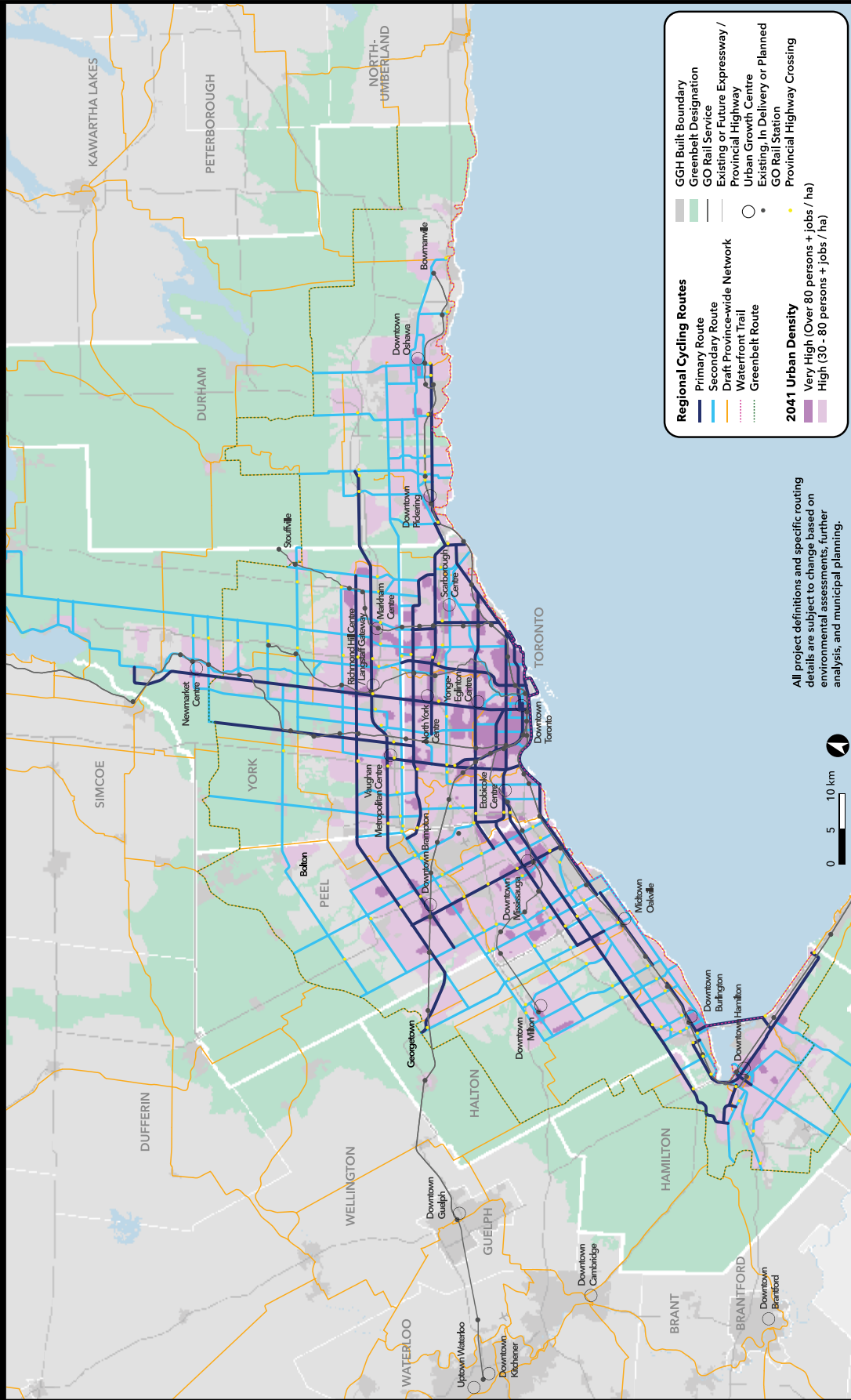


The 2041 RTP will work towards

60%

of children walking and cycling to school

Map 9: 2041 Regional Cycling Network



All project definitions and specific routing details are subject to change based on environmental assessments, further analysis, and municipal planning.

Priority Actions for Strategy 4

4.1

Develop an approach and framework for Metrolinx to review and provide input to secondary plans, publicly funded development plans and large-scale planning applications (e.g., at GO stations) to advise on alignment with the 2041 RTP.

4.2

Make investments in transit projects contingent on transit-supportive planning being in place.

4.3

Focus development at Mobility Hubs and Major Transit Station Areas along Priority Transit Corridors identified in the Growth Plan:

- Coordinate creation of station area plans that catalyze desired land uses and support transit investments.
- Systematically locate publicly funded institutions and facilities near stations on Priority Transit Corridors and subway lines.
- Integrate joint development early in rapid transit project planning and in procurement schedules, utilizing new partnerships between the public and private sector.
- Update the *Mobility Hub Guidelines* to address emerging challenges and opportunities related to the integration of land use and transportation, and incorporate new tools and guidance for planning Mobility Hubs.
- Update the network of Mobility Hubs to reflect the Frequent Rapid Transit Network, the *Growth Plan*, municipal plans, and 2041 forecasts for population, employment and transit ridership.

4.4

Evaluate financial and policy-based incentives and disincentives to support transit-oriented development. Work collaboratively to build on and develop regional and site-specific measures and tools to encourage development that supports growth management and transportation objectives.

4.5

Plan and design communities, including development and redevelopment sites and public rights-of-way, to support and promote the greatest possible shift in travel behaviour, consistent with Ontario's passenger transportation hierarchy:

- Develop region-wide standards for highways, overpasses, roads and streets to consistently reflect the passenger transportation hierarchy.
- Develop shared investment criteria for cycling facilities that focus on cycling potential and connectivity, consistent with regional and local plans.
- Adopt a complete streets approach in the delivery of transit infrastructure investments, incorporating facilities for walking and cycling access to transit stations.
- Expand and promote bike-share in locations where there is an opportunity to meet and increase the demand for cycling.

4.6

Develop and implement a Regional Cycling Network (see Map 9), creating new on- and off-road facilities that connect areas with high cycling potential to rapid transit stations and Urban Growth Centres, helping commuter cyclists traverse boundaries and physical barriers.

4.7

Embed TDM in land use planning and development:

- Use TDM plans in the development approval process to ensure that major residential, commercial and institutional developments are designed and operated to reflect the passenger transportation hierarchy, with realistic, long-term implementation plans.
- Develop regional TDM standards and guidelines.
- Leverage the development approval process to generate dedicated funding for TDM programming.

4.8

Rethink the future of parking:

- Coordinate the development of a region-wide policy that:
 - provides guidelines and encourages best practices in parking management;
 - identifies common goals for on- and off-street parking management, especially near transit stations;
 - supports land use and transportation objectives;
 - acknowledges the varied urban, suburban and rural contexts of the GTHA;
 - anticipates autonomous vehicles and shared mobility;
 - incorporates environment-friendly features;
 - can be leveraged for local policy making; and
 - includes public education and demonstrates the benefit of new parking practices.
- Coordinate station area parking requirements with the expansion of transit infrastructure and services (e.g., amend applicable transit station area by-laws as a condition for transit station approval to support local mode share targets). Zoning standards should be reviewed, with the expectation that minimum parking requirements will be reduced, particularly in transit-supportive neighbourhoods.
- Adopt a region-wide approach to parking management for the arrival of shared mobility and autonomous vehicles.
- Research and regularly publish existing parking-related data and emerging trends to improve parking planning and management.

4.9

Coordinate across ministries, school boards, municipalities, service providers, public health agencies, non-governmental organizations and other stakeholders to establish school travel programs and service solutions for Kindergarten to Grade 12 that encourage future generations of pedestrians and cyclists:

- Continue to advance active and sustainable school travel through regional coordination and delivery of the school travel program. Adopt approaches that are location-specific to ensure that solutions involving walking, cycling and transit are tailored to each community.
- Expand the resources and community capacity available to advance active and sustainable school travel in the GTHA, including to high school students.
- Develop policies, plans and standards that prioritize active and sustainable travel by children and youth in school areas and the broader community (e.g., to recreational and cultural facilities).

4.10

Assess the need for a Transportation Planning Policy Statement and a Transportation Master Plan regulation, as provided for in the Metrolinx Act, 2006, to support the implementation of the 2041 RTP.

Strategy 5

Prepare for an uncertain future



Prepare for new business models and technologies

It is not enough for Metrolinx and its partners to complete the delivery of current regional transit projects, connect more of the region with frequent rapid transit, optimize the transportation system, and integrate transportation and land use in the GTHA. While doing all this, we must also prepare for an uncertain future.

Because there are limits to how well planners can predict what will happen in coming decades, development of the 2041 RTP considered a range of possible futures. The plan emphasizes adaptive strategies that enable adjustments as the impacts of disruptive technologies are felt.

Disruption is here—just as cars reshaped cities in the twentieth century, emerging transportation technologies and business models are changing metropolitan areas in the twenty-first century. Already, car-sharing and ride-sourcing are blurring the lines between public and private transportation. Municipalities have authority to regulate private transportation companies, but a GTHA-wide approach could address cross-boundary travel and provide a more seamless experience for users.

Furthermore, advancements in automation and robotics are making autonomous vehicles—including shared autonomous vehicles—a reality. Although there is uncertainty about how quickly this technology will be adopted, autonomous vehicles are expected to dramatically change how people and goods are moved, and to have substantial impacts on our transportation and land use systems.⁷⁰ Ontario has launched a pilot project, with growing participation, allowing autonomous vehicle testing on public roads under certain conditions.

New mobility systems provide detailed data that can be used to plan and deliver better ways of meeting traveller needs. There are related issues around data privacy, however, and they loom even larger as the private sector's role in transportation data collection grows.

Strategy 5 addresses the need for all levels of government to work together to protect the public interest, while fostering innovation and partnerships that can create new or improved services for travellers.



Be prepared for accelerated change

We live in an era characterized by economic, political and environmental uncertainties, generational shifts and rapid technological advances that will challenge governments, and in extreme cases, pose threats to the transportation system. For example, many emerging transportation technologies and payment systems rely on internet connectivity, representing a vulnerability to cyber-attacks and electricity blackouts. In response, transportation systems need to be flexible, responsive, secure and resilient. By addressing these challenges and harnessing the opportunities associated with new technologies, we can improve the performance of the transportation system. The 2041 RTP promotes regional approaches that will help the GTHA prepare for accelerated change.

Build resilience to climate change

As noted in Chapter 2, the GTHA is already experiencing the impacts of climate change. Experts predict the region will experience hotter temperatures, more intense rainfall events, and more severe and frequent storms in the future. A region that is well serviced by alternative modes of transportation will be more resilient to potential travel disruptions caused by extreme weather. A climate-resilient transportation system provides options for travellers to reach their destinations safely, and protects important transportation assets. Metrolinx's *Climate Adaption Strategy* outlines key actions to prepare for extreme weather events, such as performing detailed vulnerability risk assessments, preparing a *Summer Readiness Plan* for hot temperatures, and evaluating flood risk for rail lines. Strategy 5 takes steps to make the regional transportation system more resilient by designing for future extreme weather, updating infrastructure to withstand the impacts of climate change and rebound after extreme weather events, and developing policies and protocols to respond to extreme weather events.



Perspectives on environmental sustainability

An environmentally sustainable regional transportation system is designed to reduce our reliance on fossil fuels and minimize air and noise pollution. It maximizes the use of technological innovations and sustainable materials to increase durability and efficiency, and reduce waste.

Final Report of the Residents' Reference Panel on the Regional Transportation Plan

Reduce greenhouse gas emissions

As noted in Chapter 2, transportation is the leading source of greenhouse gas emissions in Ontario (33% of total emissions in 2015). Reducing greenhouse gas emissions from transportation will require three concurrent strategies:

- Promote modal shift from personal automobiles and reduce personal vehicle travel demand through land use changes, improvements to transit services and street design, new TDM programs, and reducing barriers to walking, cycling and transit use.
- Encourage more energy-efficient driving behaviour and improve the energy efficiency of vehicles.
- Reduce fuel carbon content by replacing gasoline and diesel with alternative fuels that have a lower carbon content such as biofuels, hydrogen or low-carbon sources of electricity.

Many actions that reduce greenhouse gas emissions also reduce other vehicle pollutant emissions that are tied to chronic respiratory conditions, cardiovascular disease and lung cancer. Replacing car use with walking and cycling, including for the first- and last-mile of transit trips, not only helps our climate but also reduces air pollution and improves population health.

To help achieve the Province's ambitious goal of reducing GHG emissions to 80% below 1990 levels by 2050,⁷¹ the GTHA needs both a bold low-carbon transportation strategy and increased collaboration among all levels of government. Among other initiatives, the region's transit agencies can reduce emissions by introducing low-carbon vehicles such as electric buses. Metrolinx's *Sustainability Strategy* outlines how the organization will support Ontario's *Climate Change Action Plan (2016-2020)* by becoming climate resilient, reducing energy use, integrating sustainability into supply chains, minimizing ecosystem impacts, and enhancing community benefits.

Use big data to optimize infrastructure and improve services

“Big data” refers to the massive volume of structured and unstructured data collected by today’s companies and institutions—a volume so large that it is difficult to process with traditional tools. As the GTHA transportation system grows and changes, an ever-greater mountain of data are being collected on freight, vehicle and traveller movements. However, these data are being gathered by many different agencies, companies and mobility providers. While transportation data have historically been collected by the public sector, the role of private firms such as mobility companies and mobile phone providers is growing. Big data presents opportunities to develop and track new metrics related to regional transportation policy objectives. However, the increasing number and variety of data collectors also increases the risk that transportation planners will not have access to the right information at the right time. Increased cooperation between the public and private sectors can address this.

There is a strong history of collaboration between governments and transit agencies in the GTHA on gathering travel data, such as the Transportation Tomorrow Survey, which is conducted every five years. Strategy 5 recommends the development of a regional big data strategy for all modes of transportation. By identifying, gathering and sharing relevant data, agencies can better target resources where they are needed, use infrastructure more efficiently, and improve traveller services. These steps need to prioritize data security and privacy protection.

City of Toronto seizes the power of big data

The City of Toronto’s Transportation Services Division created the Big Data Innovation Team in 2015 with the mission of leveraging emerging transportation datasets together with existing City data to develop a new understanding of transportation issues across all modes of travel. The team uses modern data science practices to analyze transportation data and measure the impacts of the City’s policies, and partners actively with Universities, researchers and the Toronto tech community to drive its agenda. The team established a monitoring and evaluation program for the King Street Transit Pilot that relies on using sensor data to regularly track the performance of the project against a range of multimodal metrics.





Leverage innovation

In the GTHA and around the world, the private sector increasingly provides innovative services that can complement existing public transit services. New mobility services will not replace frequent, high-capacity transit systems, but strategic partnerships represent an opportunity to develop services that increase ridership and efficiency while preserving value and transparency. Transportation agencies around the world are finding that a creative, open approach to partnering with third parties and/or procuring their services is necessary to close the gap between current practices and the anticipated potential for on-demand mobility.

To benefit from the innovations offered by new mobility companies, governments need to break down barriers, provide flexibility in procurement, and develop processes that can respond quickly to new opportunities and changing conditions. It is critical for the public sector to experiment and share lessons learned. Strategy 5 identifies how partnering for innovation can be used to embrace new services, tools and business models.

Priority Actions for Strategy 5

5.1

Develop a regional framework for on-demand and shared mobility:

- Work collaboratively to harmonize local regulations and develop regional policies and guidance to enable innovation while meeting the needs of GTHA residents.
- Proactively test and evaluate new services and technologies (e.g., micro-transit, on-demand and shared mobility) in emerging markets where conventional transit and active transportation are not meeting demand.
- Coordinate and establish partnerships that complement existing and committed transit services.

5.2

Develop a region-wide plan for autonomous mobility:

- Plan and prepare for the deployment of connected and autonomous vehicles, including consideration of policy and regulatory tools that may be required to meet transportation goals (e.g., road safety, congestion management, efficient freight movement).
- Update transportation and building standards for the arrival of autonomous vehicles (e.g., standards for parking and loading spaces).

5.3

Coordinate across the region to improve climate resiliency of the transportation system:

- Plan and build a transportation system that can continue to operate in extreme weather events that accompany climate change.
- Design new infrastructure and strengthen existing infrastructure to resist extreme weather.
- Ensure that the management of existing infrastructure assets, and the design and construction of future assets, are climate resilient.
- Adopt and coordinate policies and procedures among all transportation stakeholders (e.g., road, transit and emergency management agencies) to respond to extreme weather events.

5.4

Coordinate across the region to ensure the safety, security and emergency preparedness of the transportation system:

- Develop and update coordinated emergency response plans to minimize impacts of extreme weather events, security incidents, electricity blackouts, network outages, cyber-attacks and other future threats on travellers, assets and operations.
- Advance cyber-security, backup systems and resiliency plans to prevent and mitigate service disruptions and data breaches.
- Undertake regular emergency response exercises with community participation to train staff, test infrastructure and evaluate emergency protocols.

5.5

Proactively prepare for a future with low-carbon mobility options:

- Align regional and local efforts to mitigate greenhouse gas emissions with international, federal and provincial efforts to meet the Paris Climate Change Accord, and with Ontario's goal of reducing emissions to 80% below 1990 levels by 2050.
- Continue supporting compact and mixed-use development, complete streets and other measures that help reduce travel by motor vehicles.
- Deploy infrastructure to support electric vehicle use throughout the region's public and private transportation systems.
- Invest in the transition to low-carbon public and private vehicle fleets, including transit vehicles and trucks.
- Further collaborate among governments to enhance fuel efficiency and increase the availability of low-carbon fuels.

5.6

Develop a regional transportation big data strategy:

- Create a regional transportation big data portal, providing consistent and transparent data collection, management and reporting.
- Establish regional standards for transportation data sourcing, formatting, privacy, security, ownership and reporting.
- Identify and acquire new transportation data on all modes of transportation for planning and operations (e.g., crowd-sourced traffic data).
- Advance coordination and standardization of transportation forecasting, modelling and business case methodologies to support decision-making and evaluation.

5.7

Develop a strategy for innovation in mobility to:

- Drive innovation related to new services, tools and business models.
- Develop outcome-based approaches beyond traditional procurement and formal partnerships:
 - identify and leverage companies with innovative products and services that can benefit travellers or improve operations;
 - remove barriers to partnerships (e.g., overly rigid procurement rules);
 - test and minimize risks associated with new ideas, products and approaches; and
 - explore innovative funding and financing options such as loans and loan guarantees.



How will the 2041 Regional Transportation Plan make a difference?

The Strategies and Priority Actions in this chapter provide a blueprint for achieving the 2041 RTP's Vision and Goals—but what will happen if these projects, programs and policies are not implemented? As population and employment grow, travel demand will increase and pressure will build on an already strained transportation system. Without initiatives that attract new transit users, congestion will get much worse.

What will the 2041 RTP achieve if implemented? To answer this question, Metrolinx compared three scenarios:

- the 2011 base year;
- a 2041 “do minimum” option in which only projects currently under construction are completed; and
- full implementation of the 2041 RTP.

Full implementation of the 2041 RTP would increase the length of the Frequent Rapid Transit Network by more than 25 times and introduce a regional cycling network that doubles the current length of dedicated cycling facilities, and add over 1,000 lane-kilometres of HOV lanes to the region's highways.















As illustrated in Figure 31, the 2041 RTP offers substantial benefits to GTHA residents. It will bring frequent rapid transit service close to many more homes, and greatly improve access to jobs and other services that people rely on. Full implementation will provide the average GTHA resident with access to 320,000 more job opportunities within a one-hour commute by transit. The percentage of people living within walking distance of frequent rapid transit will increase by four times, and the percentage of jobs within walking distance of frequent rapid transit will more than double (see Figure 32).

As shown in Figure 33 and Figure 34, implementation of the 2041 RTP will increase the use of transit in all travel markets. It will result in 700,000 more transit trips in the GTHA during weekday peak periods, representing a 55% increase over 2011. This ranges from a 39% increase in Toronto where transit is already strong, to a 144% increase in trips between GTHA municipalities outside Toronto, where the potential for new ridership is greater.

Transit services will benefit from rapidly growing concentrations of population and employment—Urban Growth Centres, for example—will see significant gains in transit mode share.

Full implementation of the 2041 RTP will reduce average transit trip times, despite the increase in population (Figure 35). In the “do minimum” scenario, transit travel times would be worse outside Toronto, further depressing relatively low transit mode shares.

Figure 31: 2041 RTP proposed deliverables and outcomes

THEME	INDICATOR	DESCRIPTION	SCENARIO RESULTS			IMPROVEMENT (PLAN VS. 2011 BASE)
			2011 BASE	DO MINIMUM ^{vii}	2041 PLAN	
PLAN DELIVERABLES						
	 Frequent Rapid Transit routesⁱ	Length of the Frequent Rapid Transit Network will increase by more than 25 times	68 km	156 km	1,860 kmⁱ	+1,790 km
	 Cycling routes	Length of Regional Cycling Network will double	990 km	990 km	2,000 km	+1,010 km
	 HOV / HOT lanesⁱⁱ	Total length of HOV or HOT lanes will increase by over 1,000 lane-km	73 lane-km	110 lane-km	1,130 lane-km	+1,057 lane-km
PLAN OUTCOMES						
TRANSIT ACCESS	 People near transitⁱⁱⁱ	The fraction of people that live within walking distance of frequent rapid transit will increase by 4 times	9%	11%	38%	4.0x
	 Jobs near transitⁱⁱⁱ	The fraction of all jobs that are within walking distance of frequent rapid transit will more than double	21%	21%	49%	2.3x
	 Jobs accessible within 60 minutes by transit^{iv}	The average GTHA resident will have access to 320,000 more jobs within 1 hour by transit	740,000	620,000	1,060,000	+320,000
	 % of GTHA jobs accessible within 60 minutes by transit^v	The % of all jobs available to the average GTHA resident in 60 minutes by transit will remain stable, but 9 percentage points greater than it would be in the Do Minimum scenario	22%	13%	22%	stable
MODE OF TRANSPORTATION	 Transit trips^v	There will be about 700,000 more transit trips during the daily peak periods	1.2 million	1.6 million	1.9 million	+700,000
	 Transit mode share^v	Transit mode share will increase slightly , but would decrease by 2 percentage points in the Do Minimum scenario	14.2%	12.3%	14.7%	+0.5 points
	 Active trips^v	The number of walking and cycling trips will double in the morning peak period	740,000	1,010,000	1,390,000	+650,000
	 Active mode share^v	Active mode share will increase by 2.2 percentage points during the peak periods	8.5%	7.8%	10.7%	+2.2 points
QUALITY OF LIFE	 Transit travel time^{iv}	Average transit travel time in the GTHA will decrease slightly , while the region sees significant growth	41 minutes	46 minutes	39 minutes	-2 minutes
	 Congested driving^{vi}	Congested vehicle kilometers traveled will decrease by 3 million kilometers compared to the Do Minimum scenario	3.7 million	11.1 million	8.1 million	+4.4 million
	 Environmental impact	Greenhouse gas emissions per capita from auto driver trips will decrease by 40%	2.7 tonnes	1.6 tonnes	1.5 tonnes	-1.2 tonnes

ⁱ Includes 15-minute GO Rail service, subway, BRT, LRT, Priority Bus, Priority Streetcar and Frequent Regional Express Bus corridors.

ⁱⁱ Lane-km accounts for roadway length as well as the number of lanes in each direction.

ⁱⁱⁱ Walking distance is 400 m from Priority Bus, BRT and LRT, and 800 m from subway and frequent regional rail.

^{iv} Represents trips made between 6:45 a.m. - 8:45 a.m.

^v Represents trips in the morning and afternoon peak periods (6:00 - 9:00 a.m. and 3:00 - 7:00 p.m.).

^{vi} Represents trips made in the morning peak hour.

^{vii} The "do minimum" scenario was developed to envision a future where the only additions to the existing transportation system are those In Delivery projects which have already been implemented or where construction has begun (as of 2018). Thus, the network is expanded beyond a "do nothing" scenario, but is still less extensive than the system envisioned after the In Delivery projects are completed (Map 3).



The 2041 RTP will have a significant impact on congestion, compared to the “do minimum” scenario, with 3 million fewer vehicle-kilometres travelled in congested conditions. This reduction in congestion, combined with expected improvements in automobile fuel efficiency, will yield a 40% decrease in per-capita greenhouse gas emissions from automobile trips. Achieving the goal of 100% low-emission transit vehicles would further reduce overall emissions.

Implementation of the 2041 RTP will also support an increase in active travel, with walking and cycling trips doubling from 2011. As shown in Figure 34, the percentage of travel mode share for active transportation will increase across all travel markets.

For individual travellers, an integrated transportation system will increase access to rapid transit and improve travel time reliability. These benefits are particularly important for low-income persons and other groups that rely on public transportation.

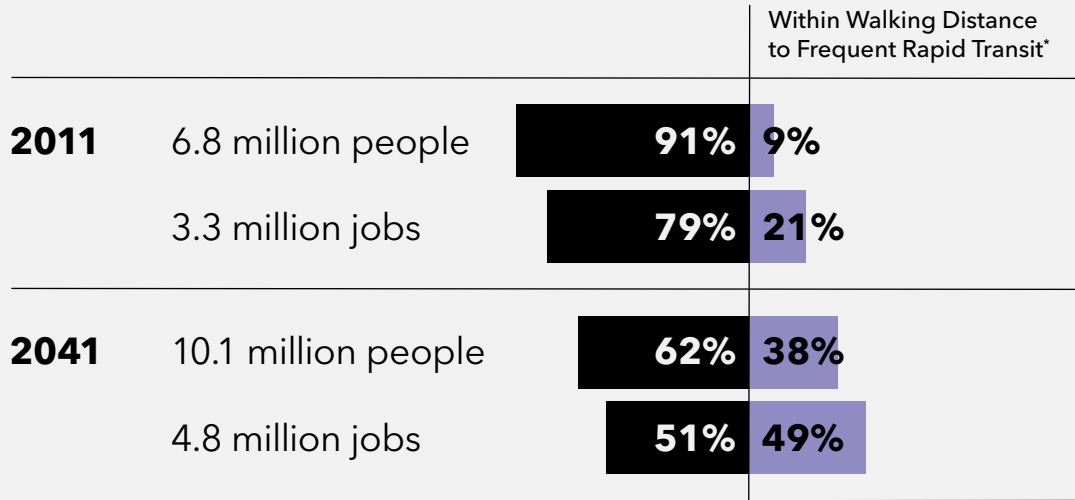
In terms of the regional economy, an integrated transportation system will improve the GTHA's competitiveness and productivity by:

- better connecting workers to employers, allowing for specialization of skills; and
- providing businesses with access to more markets, and facilitating connections between suppliers and purchasers.

Additional economic benefits will come from transit infrastructure construction and operation, which will help create jobs in construction, supply chain and service industries.

Cumulatively, the outcomes of 2041 RTP implementation are far-reaching and highly beneficial for the GTHA.

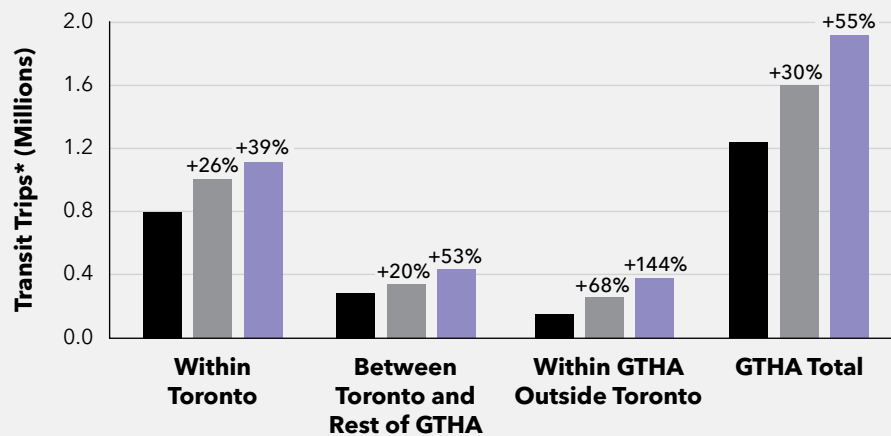
Figure 32: Residents and jobs within walking distance of frequent rapid transit⁷²



* Walking Distance is 400 m from Priority Bus, BRT and LRT lines, and 800 m from subway and 15-minute GO stations

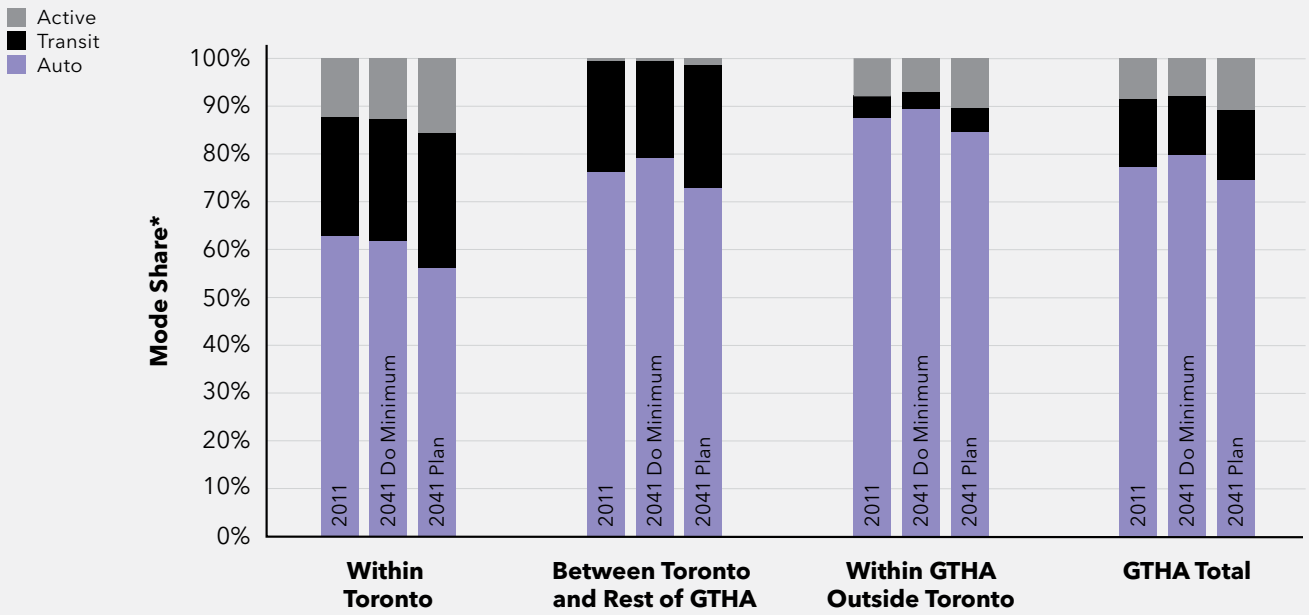
Figure 33: Increase in transit trips by travel market

■ 2011
 ■ 2041 Do Minimum
 ■ 2041 Plan



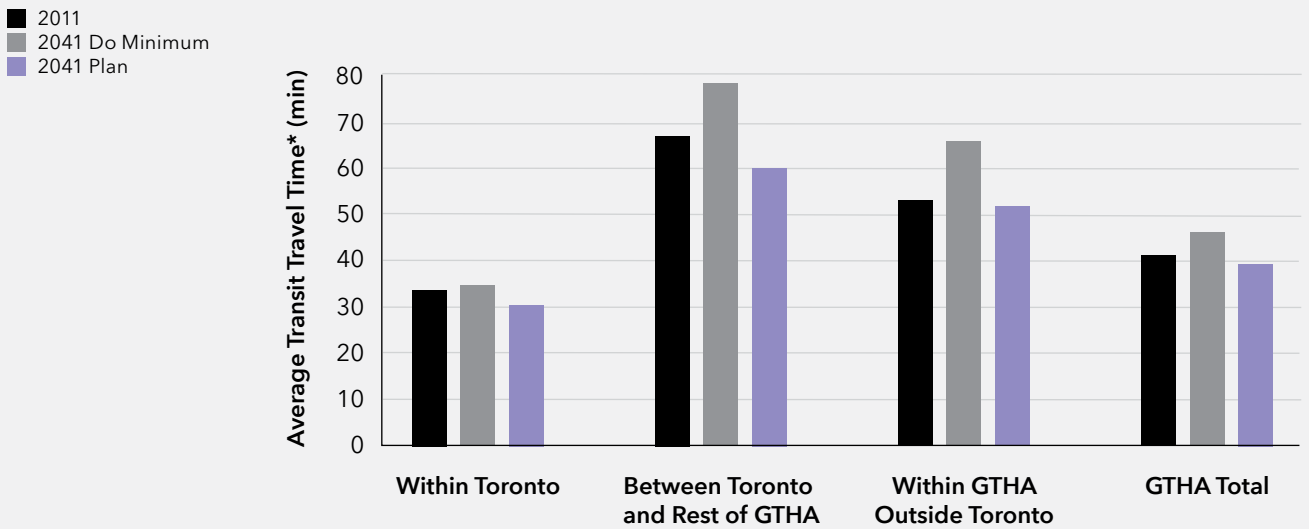
* During the peak periods (6:00 a.m. - 9:00 a.m. and 3:00 p.m. - 7:00 p.m.)

Figure 34: Travel mode share by travel market



* During the peak periods (6:00 a.m. - 9:00 a.m. and 3:00 p.m. - 7:00 p.m.)

Figure 35: Average transit travel time by travel market



* Represents trips made between 6:45 a.m. - 8:45 a.m.