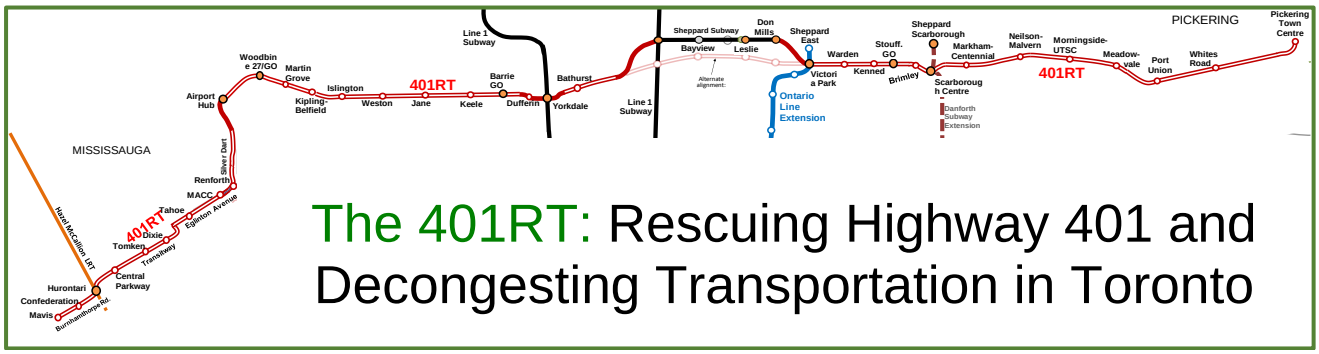


The 401RT: Rescuing Highway 401 and Decongesting Transportation in Toronto

Updated to July 2023

The absence of a continuous east-west cross-boundary rapid transit line through the suburban middle of northern Toronto is the most significant single factor in preventing major modal shifts to public transit.

A review of MTO's AADT on-ramp and commercial vehicle survey files (2013 adjusted to 2019) indicates that on a typical weekday there were 1.8 million vehicles on Highway 401 between Hurontario Street in Mississauga and Liverpool Road in Pickering. Of these, approximately 1.5 million were non-commercial automobiles, carrying 1.7 million persons.

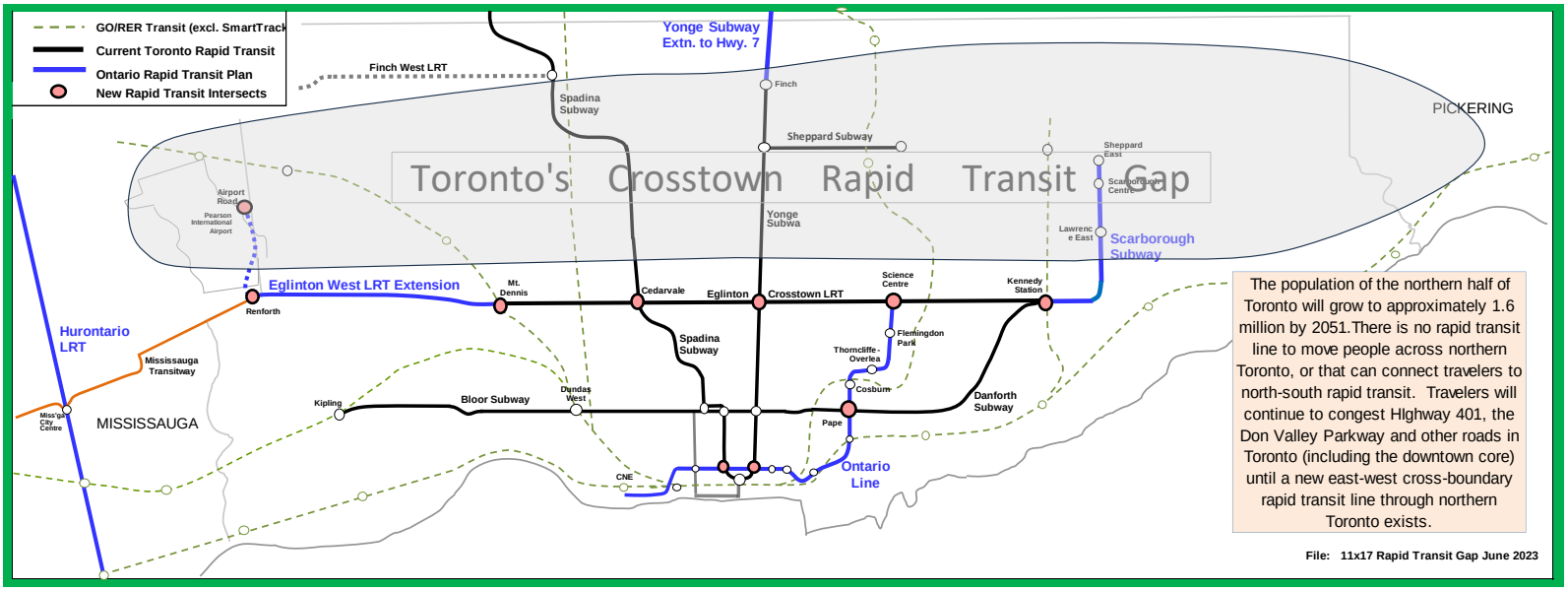
Traffic volumes on Highway 401 will increase as approximately four million people will live in Toronto by 2051. Approximately 1.7 million of them will live in the northern half of Toronto. Population growth in the municipalities around Toronto will add to cross-boundary traffic pressures. Highway 401 in the core of the Greater Toronto Area will not be able to accommodate travel demand growth much beyond 2030, as segments of the highway in Toronto cannot be widened.

Traffic on the highway is highly leveraged toward congestion, and is a scenario that must be avoided. Reducing the overall number of motor vehicles (be they powered by gasoline, electricity, or hydrogen) is a necessary part of efforts to reduce the brutal effects of rapid climate change.

Getting across the Greater Toronto Area from Scarborough to Pearson Airport, or from Hurontario Street in Mississauga to any point in North York, or to thousands of other destinations in suburban Toronto, Mississauga and Pickering normally means driving a car. Most residents of northern Toronto who travel to and from downtown Toronto will not ride a bus from Etobicoke or Scarborough to the Yonge Street or University/Spadina/York subway – it's simply too slow. The result is congestion on Highways 401, 427, 409, the 404/Don Valley Parkway, and on city streets.

The Greater Toronto Airports Authority (GTAA) has been concerned that more than 90% of all trips to Pearson International Airport are by automobile; this ratio holds true for much of its surrounding employment area. Forecasted growth in air travel will strain the GTAA's ability to provide access and car parking, and daily trips by more than 300,000 workers and visitors to the overall employment area contribute to clogged roads on Highway 401 and city streets. Because of the threats posed by growth-related congestion in the airport area, the GTAA is pursuing the creation of a transit hub on its property at Airport Road. Its intention is to provide new linkages among various current and planned bus and rail-based transit services. Unfortunately, it will not have an adequate effect on travel modes.

Existing rapid transit services in Toronto are not practical for travelers who have some or all their daily trips in parts of the northern half of Toronto. GO Rail provides a radial service to and from the downtown core that is used by just 1% of Toronto residents per day. The 5-kilometre Sheppard subway is too short to have an impact on road traffic congestion. The Eglinton Crosstown LRT, soon to become operational, is too far south in Toronto to produce a significant reduction in trips by automobile to and from most northern Toronto locations, including longer distance trips. End-to-end trip times on the planned on-street 11-kilometre Finch West LRT will be too long to attract a significant number of new transit riders, although most existing TTC users of the Finch bus will be better served. Improvements to transit to and from Toronto's employment areas and in underserved communities such as in northwest Toronto and eastern Scarborough are necessary. Overall, there is a tremendous rapid transit gap across the northern half of Toronto.



New rapid transit services proposed or initiated by the government of Ontario will not generate enough modal shifts to transit to keep 2051 trips by automobile and commercial vehicles (trucks) near 2016 volumes nor is maintaining current levels of congestion a desirable or adequate target. (Near-term Ontario initiatives include expansions of GO Transit, the Finch West and Eglinton Crosstown LRTs, and the $28.5 billion plan for an Ontario Line, a Danforth subway line extended further into Scarborough, an Eglinton West LRT that will eventually connect to Pearson International Airport, an extension of the Yonge subway to Highway 7, and a Hurontario LRT.)

The Ontario government's Greater Golden Horseshoe Transportation Plan, finalized in 2022, includes numerous rapid transit expansions in Toronto beyond currently-funded initiatives, including an easterly extension of the Sheppard Subway to McCowan Road, an Eglinton East LRT, extensions of the Finch West LRT, a Jane Street LRT, LRTs along the Toronto waterfront, and other rapid transit lines (illustration at right). In total, they will not be enough to keep overall traffic in the city from becoming more congested, including Highway 401 and the Don Valley Parkway (Figure 1).

A new cross-boundary rapid transit line from Pickering to Mississauga through northern Toronto has not been considered; yet it is an ***essential*** component if traffic congestion throughout Toronto is to

be avoided and climate change damage is to be reduced. *Nothing else will be enough,* although other actions are also needed.

Figure 1:	Millions per Yr.
Estimated Increase in trips per year by Auto+Truck in Toronto by 2051*	417.0
Less approximate GGH Transportation Plan increases in transit trips per year to 2051 (funded and unfunded):	
GO Transit Enhancements (net; to 200m)	172.5
Eglinton Crosstown LRT)	16.0
Finch West LRT Humber College to Finch W subway stn.	5.9
Finch West LRT extension to Yonge	1.8
Fnch West LRT Humber Coll. to Pearson	1.0
Ontario Line Eglinton East to CNE	49.6
Eglinton West LRT Mt. Dennis to Renforth	3.7
Eglinton West LRT Renforth to Pearson	2.2
3-Stop Scarborough Subway to Sheppard East	11.6
Yonge subway extension to Richmond Hill	3.7
Eglinton East LRT to Malvern to McCowan Rd.	4.0
Ontario Line Extension to Sheppard East	9.9
io Line - Sheppard East to Richmnd Hill Hub	4.6
Sheppard Subway extension to McCowan	7.7
Jane Street LRT	4.5
Waterfront West LRT	5.5
Waterfront East LRT	1.8
Steeles Avenue LRT - Pioneer Vill. To SheppE@McCowa	5.2
Scarborough-Durham BRT (Toronto impact)	0.9
Dundas BRT - Kipling to West Mall	4.9
	317.1
Net increase in Toronto road traffic by 2051	**100.0**

*Adjusted for increases in active transportation and work-from-home office employment. Figures are not official.

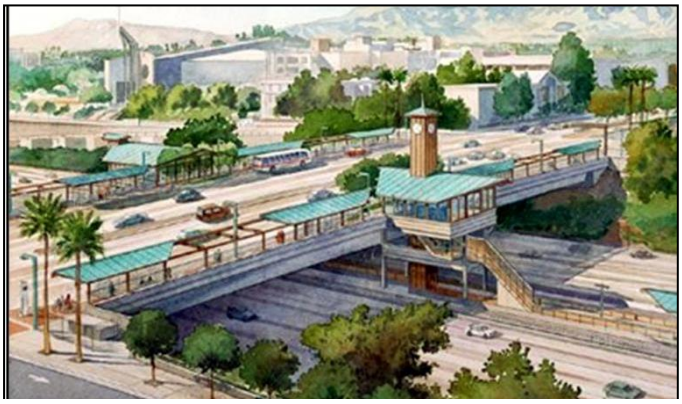
Highway 401RT

This document proposes the creation of a highly affordable suburb-to-suburb rapid transit line with up to 38 stations, operating from Mavis Road at Burnhamthorpe Road in Mississauga's city centre area to Pickering Town Centre, aligned mostly within the Highway 401 right-of-way. The need for this "401RT" is urgent. Because of potentially long implementation timelines and the costs of ongoing traffic congestion, planning for the 401RT's construction should begin now, and be fully operational within 10 to 15 years. This document will show that a 401RT is highly affordable and practical for travelers.

It is estimated that the 401RT, plus the addition of many more buses for intersecting bus services, will generate approximately 180 million *new* transit trips per year by 2051, and more in subsequent years as the region's population continues to grow. Another 12 million or more boardings per year will come from transfers from close-by parallel bus routes. The 401RT would be able to link travelers to eleven intersecting north-south rapid transit lines and 100+ surface bus routes.

For the Toronto portion of the 401RT, the 401RT can be mostly at-grade in the highway corridor or, **preferably**, be elevated above the highway. Diversions to major off-highway destinations would be either underground or elevated. Off-highway destinations include Pearson International Airport, the overall airport employment area, Yorkdale Shopping Centre, Scarborough City Centre and Pickering Town Centre, plus other destinations as may be decided. Off-highway diversions also include the Sheppard Subway, which would become an integral segment of the 401RT.

A mostly-at-grade 401RT would require a barrier-separated conversion to transit of the leftmost express lane in each direction on Highway 401, plus absorb shoulder lanes for station platform space at stations. The rail right-of-way would have to use medium-capacity rail cars that do not require the transit right-of-way to be wider than the width of a Highway 401 lane.



Pasadena California's Gold Mile concept is illustrated. Highway 401 is wider, and 401RT stations would be fully enclosed.

Westward of the 401-Islington station, the 401RT would run below grade until it can be routed above, on or adjacent to the Kitchener GO Line tracks to the new Woodbine GO station, and may run below grade at Airport Road. In Toronto, the 401RT would serve northwest Etobicoke and eastern

Scarborough directly, connecting residents to opportunities across all of Toronto. An illustrative map of the 401RT concept is shown on the last page of this document.

401RT stations at grade in the highway corridor would use a single centre platform, accessed by station entrances above the highway where intersecting roads run above the highway, and below the highway where arterial roads run below the highway. Platforms would be between 20 and 25 feet wide and only one station (at Keele Street) would require movement of pillars that support overhead roadways. In a few locations, at-grade dividers between express and collector lanes may need to be re-aligned. The mostly-at grade 401RT alignment assumes that the total volume of traffic on Highway 401 will be and/or should be significantly reduced.

An Elevated 401RT: The preferred alternative to a mostly-at-grade 401RT is one that is elevated above the highway for almost all its length, excluding the existing underground five-kilometre Sheppard Subway, with which it is integrated. An elevated 401RT avoids the conversion to transit of an express highway lane in each direction. For some segments, the track structure would need to be high enough above ground to cross over intersecting arterial road bridges. Tunneling may be limited to 7 kilometres – at Yorkdale subway station, connections to and from the Yonge-Sheppard Subway station, and near Pearson International Airport. The 401RT would be 67 kilometres in length, including the Sheppard Subway.

The elevated option would enable full-sized rail cars to be used, enabling more travelers to be carried for more years into the future, and have wider station platforms. Stations in the highway corridor would be elevated, with their entrances either above the intersecting arterial roadway or designed to enable entrances at the edge of the highway. An elevated 401RT would also enable multi-track maintenance yards to be built over the highway at several points (such as north of the Yorkdale diversion), rather than tunneling to off-highway sites. Property acquisition costs would be almost entirely avoided.

Because the overall number of new and transfer trips on the 401RT would continue to increase, plus its integration with the Sheppard subway, and because longer average trip lengths mean higher occupancy rates on trains, subway rather than light rail technology is the preferred mode for the 401RT.

An alternative 401RT alignment can be to bypass the Sheppard subway entirely, and to continue the 401RT on or above the surface in the highway corridor between Avenue Road and Victoria Park Avenue, with new stations at Yonge, Bayview, Leslie, and Don Mills. This alignment may cost close to $1 billion more than tunneling to/from Sheppard Avenue, plus the costs of decommissioning the

Sheppard Subway. With this alignment, travelling on the 401RT would be faster, and be of slightly shorter distance end-to-end. In this bypass scenario, the Sheppard subway would be closed, and Sheppard Subway station properties sold. Sheppard Avenue would be served by enhanced bus services, perhaps running seamlessly from Scarborough to Etobicoke.

The preferred alignment of the 401RT is southwesterly from the Mississauga Airport Corporate Centre towards and through Mississauga's city centre to Mavis Road. Mississauga's city centre area has become a populous high-density growth area. As an alternative or additional route, the 401RT can turn northwesterly from the MACC station (Mississauga Airport Corporate Centre) and continue above the Highway 401 right-of-way to Hurontario Street. This route would cost less to construct. The southwesterly alignment to Mavis Road at Burnhamthorpe Road would likely generate significantly more new transit trips than the northwestern 401RT segment to Hurontario Street at Highway 401.

Most on-highway 401RT stations are entered from arterial roads that cross the 401 above the highway; others are entered from below, or are off-highway stations. Station designs are recommended to be of a simple, practical nature. For the elevated 401RT, stations can be larger and would be more complex, with greater vertical distances for stairways, escalators, and elevators.

Passenger car drop-off and pick-up facilities can exist where space allows at Highway 401 on-ramps and off-ramps. For stations where right turn on-ramps to Highway 401 would interfere with the safe movement of buses leaving 401RT station stops, left turns onto the 401 governed by traffic signals can replace circular right-turn on-ramps to the highway; alternatively, signal lights can enable bus merges from bus bays into mixed traffic. At a few stations, multi-level pay-for-parking garages can be built with passenger drop-offs incorporated in their designs.

Importantly, the 401RT concept includes 16 additional buses for each intersecting arterial bus route to improve service frequencies, plus a transit shelter at every bus stop on these routes. Most transit trips begin with a bus ride, and ensuring maximum comfort, convenience, more express options, and shorter wait times is essential. These improvements will increase trips to and from the 401RT and for trips not involving transfers to or from the 401RT, and will make the first/last kilometre segments of trips acceptable to more travelers. Another new factor that will enhance the first/last mile experience is the growing use of electric scooters and e-bicycles. These enable relatively fast access to/from bus stops, especially in suburban areas, with little or no muscular effort. All bus stops and train stations should include scooter and bicycle lock-ups.

Overall, the 401RT itself will generate approximately 122 million new transit trips per year (400,000 per day) by 2051, while improved TTC bus services on north-south routes that intersect with the 401RT will attract an additional 43 million new trips per year that bypass the 401RT (see Transit Ridership Analysis section). New intersects with GO Transit will add another 16 million to GO ridership per year by 2051. Altogether, including ongoing work-from-home circumstances and other rapid transit initiatives, the number of daily trips on Toronto's roads in 2051 would be reduced by 10%.

Altogether, the 401RT will enable the trip capacity of the highway corridor itself to be at least doubled; modal shifts to transit will reduce or end highway congestion for trucks and other commercial vehicles. The implementation of variated highway tolls for small and large vehicles, and by distance traveled, can also foster more efficiencies.

The 401RT's connections to north-south rapid transit and bus services, and its ability to take travelers end-to-end from Pickering Town Centre through Toronto and into Mississauga in one hour,

make it a practical choice for travelers. Its visibility and speed compared to rush hour road congestion will create a general equilibrium that will see modal shifts to transit occur when the highway is congested or too frustrating to accept, and from transit to driving when the highway is seen as more desirable.

Without a 401RT or similar rapid transit option, ongoing road congestion is inevitable.

The idea of widening the highway to increase its road capacity has been proposed, but property acquisition, reconstruction of intersecting bridges and adding more pavement would be extremely expensive, and is also contrary to the promotion of transit ridership and the reduction of greenhouse gas emissions. Adding highway road capacity would encourage more road traffic on city streets. Conversions of vehicles to electric power will reduce end-use GHG emissions, but GHG emissions will remain significant, from the mining and production of EVs and from fossil fuel burning electric power plants that fuel EVs. While currently-approved transit system expansions and enhancements and the 401RT may seem to be ambitious, considering the dire consequences to all life of accelerating global warming, they are far short of enough. ***The climate crisis alone is sufficient reason to create a 401RT.*** Appendix 1 highlights the dangers of worsening climate change. Appendix 3 answers a variety of questions or concerns about the 401RT.

Travel Times

The 401RT would have a substantial positive effect on travel times for transit users, when compared to existing transit services and other proposed LRT services. On average, stations on the 401RT are 1.8 kilometres apart, enabling high cruising speeds between stations. The illustration shows a few examples of trip origins and destinations, and their trip times when using the 401RT compared to other modes.

Traveling on the 401RT:		***Keele at Lawrence to Centennial***		***Kipling subway stn. to***	
Pickering Town Centre to Yonge subway	27	***College in Scarborough:***		***Bathurst at Sheppard:***	
Yonge & Sheppard to Pearson Terminal	21	Using Eglinton LRT +		Using Eglinton LRT	60
Pearson Airport to Mavis-Burnhamthorpe	15	Markham bus	49	Using B-D & Yonge subways	58
	63	Using **401RT**	38	Using **401RT**	47
Average speed - 54 km per hour					
		York Mills subway station to		**Yonge & Lawrence to Pearson:**	
St. Andrew subway stn to Pearson Term'l:		***U of T in Scarborough:***		Using Eglinton LRT	7
Using Eglinton LRT	42	Using Eglinton East LRT	59	Using **401RT**	4
Using UP Express train (walk, wait, ride)	46	York Mills bus to Morningside	46		
Using Spadina subway & **401RT**	41	**401RT** to Morningside + shuttle	31	***Eglinton/Don Mills to Pearson Term'l:***	
				Using Eglinton W LRT	30
Sewells Rd at Morningside to		***Union station to***		Using **401RT** to terminal	42
Sheppard W Subway stn.:		***Scarborough Centre:***			
Using Sheppard bus & Sheppard subway	68	Using Bloor-Danforth subway	38	***Keele at Sheppard to UTSC:***	
Using 401RT	41	Using **401RT**	42	Using Keele bus + Eglinton LRT	84
		Eglinton LRT + McCowan bus	56	Using Keele bus + **401RT** + shuttle at Morningside	42

Benefits of a 401RT

The 401RT is of transformative significance, and would affect other transit enhancement decisions in Toronto, Mississauga, and Durham Region. The scale of the 401RT reflects the magnitude of the transportation and climate change problems facing the region. The overall traffic congestion problem in Toronto cannot be resolved with constrained approaches. The following list of general benefits is lengthy and significant, and highlights the strategic importance of the 401RT in the Toronto area. Local benefits are generally not included in this list.

1. The first practical transit alternative to driving across northern Toronto is created, bringing rapid transit much closer to many thousands of today's car-driving commuters.
2. Up to eleven new rapid transit connections are created (Hazel McCallion LRT, Mississauga Transitway, Union-to-Pearson Express, Woodbine GO, Barrie GO, Spadina/York Subway, Yonge Street Subway, Oriole GO (re-located), an extended Ontario Line at Victoria Park Ave., the Scarborough Subway extension, and a possibly-relocated Agincourt GO station or additional GO/401RT transfer station south of the Agincourt GO station).
3. Approximately 100+ new surface bus route connections to rapid transit are created.
4. North-south bus trips to rapid transit are significantly shorter in time and distance.
5. Gridlock on Highways 401 is avoided as high volumes of transfers from the highway to rapid transit occur.
6. The trip capacity of the highway corridor is more than doubled.
7. Overcrowding of the Yonge Subway is avoided as an Ontario Line extension (OLX) to the 401RT at Victoria Park Avenue, and to Sheppard Avenue East (described in the next section) diverts travelers from the Yonge subway that is planned to be extended to Highway 7.
8. The 401RT/OLX combination reduces or ends road congestion on the Don Valley Parkway.
9. The 401RT relieves potential over-capacity pressures on the Eglinton Crosstown LRT.
10. Traffic congestion on city streets throughout Toronto and in parts of Mississauga and Pickering is reduced as major modal shifts to transit occur: all road trips begin and end on local streets.
11. The 401RT and its intersect with an Ontario Line extension reduce the number of automobiles on the highway and on city streets by an average of close to 15%, a reduction that can enable some streets to have more and safer bicycle lanes, wider sidewalks, and more greenscaping.
12. Truck transport is improved as gridlock on highways 401 is avoided as car drivers transfer to transit when the highly-visible 401RT is seen to be as fast, convenient, or affordable as driving.
13. Travel times across the northern half of Toronto are significantly reduced when compared to current transit services. End-to-end travel time on the 401RT (Pickering Town Centre to Hurontario Street; 67 kilometres) is approximately 62 minutes.
14. The 401RT increases transit ridership by 166 million per year by 2051, including a 43 million annual increase in local non-401RT trips on enhanced intersecting bus services and 16 million new 401RT trips resulting from new GO Rail intersects. Another 11 million new trips are estimated to be generated as a result of car cost increases, household income constraints, and other factors.
15. GO Transit ridership increases by approximately 16 million trips per year beyond current forecasts by 2051 as a result of up to four new Intersects with the 401RT (Kitchener Line at Highway 27, Barrie GO Line, a potentially relocated Agincourt GO, and Leslie-Oriole GO).
16. Traffic congestion on Highway 401 west of Toronto is reduced, as a Kitchener GO Transit Line link to a Woodbine/Hwy 27 401RT station enables car-free access to east-west destinations in northern Toronto and links to north-south transit services across the city.
17. 401RT's Barrie GO, Oriole GO and (potentially) Agincourt GO stations reduce road congestion on Highway 401 and other roadways in by enabling more commuters to use public transit to access destinations across the northern half of Toronto and the airport employment area.
18. The addition of large multi-level garages above the Weston and Jane 401RT stations (plus access ramps) may enable the creation of a transfer point for drivers having come south from Highway 400. This would enable people to avoid using city streets to get to downtown Toronto or other destinations.

19. In general, access to services and to employment across Toronto and to/from Mississauga, Pickering and Brampton become much faster and easier, especially for people who are economically disadvantaged, or do not own cars or cannot drive.
20. Rapid, affordable, and direct rapid transit access to Pearson International Airport from downtown and from suburban locations across the region is created (Approximately 85% of trips to the airport do not originate from downtown Toronto).
21. The Greater Toronto Airports Authority's plans for a transit hub are transformed to be much more effective.
22. Rapid direct access to Pearson International Airport via the 401RT from locations across Toronto makes the Government of Ontario's planned $2 billion extension of the Eglinton Crosstown LRT from Renforth to Pearson International Airport unnecessary. The 401RT station at Eglinton Avenue (MACC or Renforth) would provide the rapid transit link to/from Pearson. The 401RT makes the operational viability of the entire Eglinton West LRT uncertain; however, construction of the LRT has begun.
23. Access to the employment areas surrounding Pearson airport is greatly improved; these employment areas in Mississauga and Toronto revitalize as their enhanced accessibility helps them to become more attractive to business and to workers.
24. Current and forecasted road overcapacity situations in the large employment areas around Pearson International Airport are alleviated or avoided.
25. Employment opportunities and labour market conditions are enhanced. Fewer people will decline employment opportunities near the airport due to road congestion and travel times. This resolves an important concern of employers, especially at and near Pearson International Airport, regarding workforce access.
26. The 401RT's intersect with the Danforth subway's extension at Scarborough City Centre significantly increases ridership on that extension.
27. A 401RT makes it unnecessary to build a Sheppard Avenue East LRT or subway, which would be replaced by the nearby and faster 401RT service. Infrastructure cost savings are more than $1 billion for an LRT and up to approximately $4.8 billion for a subway.
28. Enhanced access from across all of Toronto to the University of Toronto Scarborough Campus, Centennial College (Scarborough), York University, and the U of T downtown campus is created. Many students will no longer need to decide on courses of study based on travel time and distances to campuses, or need to purchase a car.
29. Improved and rapid access to the University of Toronto's Scarborough campus using the 401RT will reduce ridership volumes on the proposed Eglinton Crosstown East LRT extension, rendering it unnecessary. Savings from eliminating the LRT extension range between $4.0 billion to $4.4 billion. However, it may be worthwhile to extend the LRT to Kingston Road only, a cost of approximately $1.1 billion.)
30. The Jane Street LRT proposed by Toronto may become unnecessary as east-west connections provided by the 401RT, the Finch West LRT, and the Eglinton Crosstown LRT at Jane attract Jane bus users and reduce passenger volumes and trip-length crowding on Jane Street buses to Bloor Street. Savings may be $2.6 billion.
31. A proposed $2 billion Sheppard Avenue subway extension between Yonge Street and Sheppard West station would become unnecessary and should be avoided, as the 401RT would extend from the Sheppard-Yonge subway station to Yorkdale station and much farther westward, into Mississauga, making it more advantageous for travelers.
32. Access to employment opportunities and services for residents of disadvantaged communities is significantly improved (e.g., northwest Etobicoke, eastern Scarborough, Parkdale).

33. Direct rapid transit access to Mississauga's Airport Corporate Centre (at MACC station) from across northern Toronto and Mississauga is created.
34. As an economic stimulus, as approximately 185,000 job years are created as the 401RT is constructed – more than any other public job creation project in the GTA has achieved.
35. Canada and Ontario government capital cost contributions would result in an influx of more than $20 billion into the Toronto area economy during the 401RT's construction.
36. Several hundred ongoing transit operating jobs are created.
37. Economic losses from traffic congestion are reduced; business efficiency is improved.
38. Economic losses from imports of motor vehicle fuels and automobiles are reduced.
39. The 401RT helps enable the transformation of Yonge Street north of Hwy 401 as the Yonge Street subway is extended to Highway 7. The 401RT will attract new transit users from north of Finch subway station, making it easier for them to access east-west employment.
40. Greenhouse gas emissions are reduced by close to 400,000 metric tons per year until electricity-powered vehicles become more prominent. Toxic vehicle emissions and their negative effects on health are also reduced.
41. The number of deaths and injuries from motor vehicle collisions and the traumas and costs borne by the families and friends of crash victims are reduced, as are the associated daily congestion effects of collisions.
42. The operational effectiveness of the Toronto area's pre-existing transit system is improved; for example, more people will use existing buses and new buses as service frequencies improve with the addition of more north-south buses as part of the 401RT concept.
43. Suburban sprawl is eased, as development in the central area of the GTA is attracted by the 401RT, including building construction near, at or above the highway at 401RT stations.
44. Improved transit access via the 401RT supports an increased distribution of work across Toronto outside the downtown core. Rapid access to/from the 401RT improves automobile-free connectivity for businesses, and access for workers who live both downtown and in suburban areas.
45. Rapid transit access to places of work or home outside the downtown core enables the number of parking spaces downtown and across Toronto to be reduced; opportunities to transform public downtown parking spaces into open greenspaces or other public uses are increased.
46. Property tax revenues are increased from new urban development at/near 401RT stations, and from increased property values in parts of Toronto, Mississauga, and Pickering, and in some '905' areas served by GO Transit.
47. Travel costs are reduced for thousands of households as fewer cars need to be owned, or are used less. Money saved can be redirected towards other household priorities. After-tax household savings vary widely, but can range to more than $10,000 per year per vehicle, less the cost of using public transit. This is a significant household affordability opportunity.
48. The overall operating revenue-to-cost ratio for the 401RT could achieve 90% by 2051, much better than that of Toronto's overall public transit system.
49. Based on new transit ridership generated, the overall cost-effectiveness of the 401RT would be close to three times that of Ontario's $28.5 billion Rapid Transit Plan for Toronto.
50. For Mississauga's residents, aligning the 401RT through Mississauga's city centre would enable affordable access to destinations to and from the airport area and across Toronto, and generate modal shifts to public transit that would reduce growing congestion on Highway 403 to/from Toronto.

51. The operational revenue-to-cost ratio of the Hazel McCallion (Hurontario) light rail transit line in Mississauga is improved as its intersect with the 401RT attracts new ridership; additional high-density urban nodal development at and near Hurontario Street is supported.
52. In Durham Region and the city of Pickering, the prospects for further urban development in the Pickering Town Centre area at Liverpool Road and along Highway 2 would be enhanced. Future off-highway extensions of the 401RT above Highway 2 to Brock Road and beyond are possible. A 401RT would be an alternative to what is now a forced daily drive on congested highways to and from Toronto.
53. The 401RT at its Port Union, Whites Road, and Liverpool stations enable transfers between the Durham-Scarborough BRT and 401RT to speed travel for many cross-boundary commuters.
54. In York Region, the 401RT and Ontario Line extension (described in the next section) to Sheppard Avenue East would ease road congestion to and from Toronto as York Region bus services connecting to the 401RT improve.
55. In Mississauga, access to the 401RT and more frequent bus service connections reduces Highway traffic volumes to/from Toronto.

A 'Relief Line' for the 401RT

The City of Toronto and the Government of Ontario have recognized or many years the need for a "Relief Line" subway to divert transit ridership from the already-crowded Yonge subway, portions of which will be at or beyond capacity by 2031. In April of 2019, the Ontario government announced its commitment to build an "**Ontario Line**" subway from Exhibition Place to Eglinton East at Don Mills Road. The Eglinton Crosstown LRT is scheduled to become operational in 2024, and will result in more transit users crowding the Yonge Street subway. Unfortunately, the Ontario Line is not scheduled to become operational until 2029 or later, long after the opening of the Eglinton LRT. This will be a significant problem for the Toronto transit system and for transit users.

It is ***essential*** that the Ontario Line be extended northward from its currently-approved terminus at Eglinton Avenue East, to a 401RT station. Without this connection to and from downtown Toronto, the 401RT will further worsen crowding on the Yonge Street subway. West of Yonge Street, the Spadina/York subway line is currently operating under capacity and can accommodate transfers to and from the 401RT, via the Yorkdale subway station.

Between Eglinton and Lawrence Avenue, the Ontario Line can be aligned above ground. South of York Mills Road, the Ontario Line would need to descend to underground and turn eastward under York Mills Road and under the East Don River to a station at Victoria Park Avenue at Highway 401. The intersect at Victoria Park would be most effective for trips to and from Scarborough and Pickering. Stations are envisaged to be at Barber Green, Lawrence East, Kern Road, and York Mills Road, plus a station at Sheppard Avenue East. The York Mills station, located below the Don Valley Parkway, would include a multi-level user-pay garage above or alongside the parkway intersection, to enable drivers to transfer from the 404/DVP to the Ontario Line. The Ontario government's long-term vision for the Ontario Line has been to continue to align it with Don Mills Road, to eventually pass close to Seneca College and further to Richmond Hill. However, that alignment may be too close to Yonge Street to be a significant generator of new trips to/from north of Highway 401.

This 7.5-kilometre extension of the Ontario Line north of Eglinton East would cost approximately $3.8 billion, excluding the parking garage. It is estimated to generate ten million new transit trips per year by 2051, including 1.8 million transferring from the 404/DVP.

The Eglinton-to-Sheppard Avenue East segment of the Ontario Line would

1. Increase trips by transit between Scarborough and the downtown Toronto area, including an increase in the transit modal share of all trips;
2. Divert significant traffic volumes from the Don Valley Parkway (DVP);
3. Together with enhancements to GO Transit, diversions to rapid transit help to eliminate the perceived need to rebuild the Gardiner Expressway east of Jarvis Street;
4. Create direct access to the north-south rapid transit east of Yonge Street, and 401RT stations across Toronto;
5. Enable fast transit access to/from the corporate employment area at and north of Eglinton Avenue East at Don Mills Road;
6. Increase utilization of the Eglinton Crosstown LRT by creating quick access to it from north of Eglinton Avenue East;
7. Reduce crowding on the Yonge Street subway by creating alternative access to downtown Toronto for new and current transit users north of Eglinton Avenue East;
8. Increase planned ridership on the Ontario Line south of Eglinton Avenue East as residents along the currently-planned route have faster access to new Ontario Line stations north of Eglinton and to many other rapid transit network connections;
9. Remove approximately 1.8 million trips by automobile from the DVP per year;
10. Reduce crowding on the Don Mills bus service for ongoing users;
11. Promote urban infill and intensification at and near stations along its route and along intersecting roadways;
12. Reduce overall road traffic along Don Mills Road and nearby streets;
13. Increase the utilization of intersecting surface transit services (Lawrence East, York Mills/Ellesmere, Victoria Park, Sheppard East);
14. Reduce greenhouse gas emissions from modal shifts to transit, including emissions by DVP drivers who would otherwise drive long distances to destinations in Toronto; and
15. Increase attendance at the Ontario Science Centre, if it is not moved to Ontario Place.

Combined Effect on Road Congestion

The 401RT scenario estimates that the total number of daily trips by motor vehicle in Toronto by 2051 is estimated to increase by approximately more than 300,0000 per day by 2051, compared to 2023 volumes. The estimate is based on 2023 modal shares of all trips (by auto driver and passenger, local transit, GO Transit, Walk/cycle/other), a population forecast of 4.2 million Torontonians by 2051, a decline in trips per person, estimates for cross-boundary travel, an increase in the modal share for active transportation, trip reductions for work-at-home office employment, an estimate for increased numbers of commercial vehicles (mostly trucks), and an assumption that there will be incremental improvements to existing Toronto transit services.

Rapid transit expansions included in the Ontario government's Greater Golden Horseshoe Transportation Plan for Toronto will generate almost one million new transit trips per day, or 300 million per year, by 2051. While this is a major increase in transit trips, it is not adequate – traffic congestion will remain, and worsen (Figure 1). Moreover, the increases in transit trips will not significantly affect growth in travel demand for Highway 401, which will experience more congestion.

The 401RT and the Ontario Line extension (OLX) to Sheppard Avenue East would decrease daily motor vehicle trips by more than 600,000 by 2051; together with other transit initiatives, they would produce an overall 8% decrease in trips compared to 2023 volumes. Congestion on Highway 401 would be even greater, because of the 401RT's high visibility in the corridor.

Affordability

Beyond the basic numbers, there's something to be said about doing more than what is normally thought to be affordable with public funds. Until recent years, the Ontario government has declined to build more than about three kilometres of municipal rapid transit per year (Eglinton LRT, Spadina subway extension), largely attributed to a lack of fiscal resources.

The Ontario government's $28.5 billion Rapid Transit Plan for the GTA, which is being actively implemented, would add an average of 6.2 kilometres per year, if spread over a ten-year implementation. The 401RT and Ontario Line extension (OLX) north of Eglinton Avenue East would add another 6.7 kilometres per year, if spread over 10 years. While this seems to be a great deal compared to past years, it is relatively small when compared to the growing multi-billion-dollar annual cost of road congestion and the devastating impacts of climate change (Appendix 1).

The money for more and better rapid transit services exists within Ontario's $957 billion (2021 est.) annual gross domestic product, and Canada's annual $2 trillion GDP. It is fundamentally a governmental decision about the allocation balance of the GDP between supporting and enhancing public services or favouring private activity.

Before savings and offsets, the all-in gross capital investment cost of a mostly elevated 401RT plus the Ontario Line extension to Sheppard Avenue East would be near $27.8 billion.

For the elevated 401RT concept, the Ontario and municipal shares of building the 401RT and OLX annual debt carrying cost of the 401RT and OLX would grow to peak at approximately $800 million per year by 2051, before expenditure offsets (at 4.5% interest). Based on federal provincial cost-sharing for public transit infrastructure, Ontario would pay 60% of the gross infrastructure costs of the 401RT/OLX. If non-residential taxpayers pay 25% of the Ontario cost, the direct daily cost to Toronto households of debt interest payments for the Ontario and Toronto share of the infrastructure cost will grow to approximately 16 cents per day per household by 2051, before expenditure offsets (see below).

These costs are highly affordable when compared to the benefits of the 401RT and the negative impacts of its absence, principally widespread gridlock on roads and highways. Upper levels of government have a direct and significant economic interest in ensuring the free flow of people and goods on major highways. In the scenarios described in this document, the Ontario and Canada governments fund 100% of all capital component costs. Municipalities would fund 100% of operating deficits once the transit lines become operational.

The City of Toronto will struggle to fund transit operating deficits, due to revenue shortfalls. However, funding must be found, because if it is not found, transit services will decline and traffic on the city's roads and highways will face extended periods of daily gridlock.

Savings and Cost Avoidances

The capital cost of the 401RT/OLX is significantly overstated because it does not include savings and cost avoidances that should be applied. As illustrated below, in a scenario where the 401RT and Ontario Line extension become a reality, the 401RT makes several rapid lines contained in Ontario's Greater Golden Horseshoe Transportation Plan unnecessary. The cost savings and offsets are highly significant – potentially totalling $12 billion.

- The GGH plan includes an extension of the Sheppard Subway to McCowan Road ($4.8bn; originally estimated at $2.8 bn) that would not be needed with a nearby and parallel 401RT in place. Many Sheppard Subway users would use the 401RT instead.
- Using the 401RT would be faster for many travelers heading to and from the University of Toronto's Scarborough campus and the Malvern community than using the planned Eglinton East LRT extension ($4.4 bn); ridership on the LRT would drop. However, the LRT can be extended to Kingston Road only ($1.1 bn). Improved bus services can replace the LRT on Kingston Road and Morningside Avenue.
- A faster and more comfortable 401RT and Eglinton LRT would divert many Jane Street bus users from riding all the way to Bloor Street. A Jane LRT would not be needed, saving $2.6 billion.
- A short (1km) extension of the Eglinton West LRT from Renforth Drive to the 401RT's MACC station will enable travelers on the Eglinton LRT to access Pearson International Airport via the 401RT. There is no need for the Eglinton West LRT to be extended to Pearson; a $2 billion expenditure can be avoided.

In addition to this $12 billion, the GGH Transportation Plan already includes a northward extension of the Ontario Line past Sheppard Avenue East. Ontario is already planning to pay for the OLX.

Not in the illustration, and not needed once the 401RT is in place are, the GGH plan's Pickering-to-Scarborough Centre portion of the proposed Durham-Scarborough Bus Rapid Transit concept, because the 401RT would replace it. Additionally, the GGH plan's extension of the Ontario Line north of Sheppard Avenue that loops to a transit hub at Highway 7 is too close to the Yonge subway to be of optimal use, and would likely not be justifiable based on ridership.

Importantly, the overall net additional public cost commitment of the 401RT and Ontario Line Extension can be as low as $11.9 billion, while generating 192 million new transit users per year by 2051 – an average cost of $62 per new user. The $12.1 billion net cost of the potential expenditure offsets would generate approximately 17 million new transit users by 2051 – an average cost of $723 per new user. **The 401RT/OLX is five times as cost-effective as the four unneeded transit lines (figure at right)**. This should not be overlooked.

	New Trips (Million/yr)	Gross Infra. Cost ($Mil)	Cost per New User
Unneeded rapid transit*	17	12,100	$723
Elevated 401RT + OLX	192	27,800	$145
Comparative Ratio	11.44	2.30	4.98
401RT/OLX Cost Effectiveness Advantage = 4.98			

* The Sheppard Subway eastern extension, the Eglinton East LRT neyong Kennedy/Kingston Road intersection, the Eglinton West LRT from Renforth to Peason, the Jane LRT.

Recent information regarding the cost of constructing the 67-kilometre 26-station Réseau Express Metropolitain (REM) in Montreal by CDPQInfra may indicate that the costs for building the 401RT may be overstated. However, the specific potential for savings cannot be estimated at this time, and are not included in this document. The costs of the REM are born by multiple partners (including CDPQInfra), and are not primarily subsidized by the government of Quebec.

The average direct net provincial cost per day per average Toronto household may be as low as 7cents per day to build the 401RT/OLX.

A key point is that even if all the currently-planned unfunded initiatives are constructed, it will still be necessary to construct the 401RT/OLX. The appropriate approach would be to build the 401RT/OLX first, and then evaluate the necessity of additional transit infrastructure.

Annual Debt Carrying Costs ($millions) at Completion	Millions $		
	401RT/OLX	Reductions	Net
Gross capital cost ($m):			
401RT	24,000	12,100	36,100
OL Exten to Sheppard East	3,800	3,800	0
Total Gross Capital Cost	27,800	15,900	11,900
Federal share @ 40%	6,950	3,975	2,975
Net	20,850	11,925	8,925
Debt interest rate	4.50%	4.50%	4.50%
Debt interest - annual	938	537	402
Household share of Ont. taxes	48.4%	48.4%	48.4%
Household share of tax cost	454	260	194
Ontario population 2046	20,000,000	20,000,000	20,000,000
Avg. persons/household	2.50	2.50	2.50
Ontario households 2046	8,000,000	8,000,000	8,000,000
Annual cost per household	$57	$32	$24
Avg. cents per day	**16**	**9**	**7**

The overall capital cost of the 401RT can be further reduced if air rights over Highway 401 for private urban development are sold, and which can require the developers to build 401RT stations of basic design at little or no cost to government. Potentially, this may reduce the cost of building the 401RT by up to $2 billion.

Because there is significant benefit to the federal government in terms of improved access to Pearson International Airport, contribution to federal greenhouse gas reduction targets, and increased employment, a one-third federal contribution is assumed to be attainable. Similarly, provincial funding is also appropriate because of positive impacts on provincial finances from employment, improved road traffic flow for freight transport, and reduced importation of motor fuels and automobiles.

Other affordability comparisons are also appropriate:

A high-speed rail (HSR) service between Toronto and Windsor, at a cost of approximately $21 billion, has been proposed in the recent past. The gross capital cost of the 401RT and Ontario Line extension north of Eglinton Avenue East would be $6.8 billion more expensive. However, while the HSR plan has been estimated to serve 10 million passengers per year, the 401RT and Ontario Line extension would carry *192 million* new transit riders per year by 2051 – 19 times more than the proposed HSR. This advantage makes a priority implementation of the 401RT/OLX highly appropriate.

	Millions New Trips per year	**Gross Infra. Cost ($Mil)**	**Cost per New User**
HSR to Windsor	10	21,000	$2,100
401RT + OLX	192	27,800	$145
Comparative Ratio	19.2	1.3	**14.5**

401/OLX is 14.5 times as cost effective as HSR

A comparison between the elevated 401RT+OLX and the Ontario Rapid Transit Plan is also useful. For a similar gross cost, the 401RT+OLX achieves approximately 2.5 as many new transit trips than estimated for the Ontario plan for similar cost.

	New Trips (Million/yr)	Gross Infra. Cost ($Mil)	Cost per New User	New Kms. Of Track
Ontario Rapid Transit Plan	76	28,500	$373	58.0
Elevated 401RT + OLX	192	27,800	$145	69.3
Comparative Ratio	2.51	0.98	2.57	1.19
401RT/OLX Cost Effectiveness Advantage 2.57				

Generating New Transit Ridership

Approximately 1.3 million people call the northern Toronto area their home. It is also where there are almost 400,000 jobs and many other destinations. By 2051, the area's population and number of jobs may increase by 30% or more. It is underserved by rapid transit, which to date has been focused mainly on bringing people to and from the downtown Toronto core. The 401RT will provide the east-west and north-south connectivity that is missing.

it is estimated that by 2051, a 401RT plus its arterial road feeder buses would carry 166 million new transit riders annually, plus 12 million or more transfers from existing local transit services. The Ontario Line extension to Sheppard Avenue East at Victoria Park Avenue would generate another 10 million new transit trips per year. The 401RT would also boost GO Transit ridership by approximately 16 million trips per year.

An important viability factor is that the longer the length of an urban rapid transit line, with stations added along the way, the more intensively it is used. As length is increased and new stations are added, new ridership not only originates at each new station added; the new stations also become destinations for additional transit riders whose trip origins are at pre-existing stations and who can now easily access the new stations. The Sheppard subway's short five-kilometre length is the principal reason why it is not operationally viable.

Ridership on the 401RT would come from a variety of sources, including

- Modal shifts by drivers using Highway 401 between and beyond the east and west 401RT terminals at Pickering Town Centre (Liverpool Road), and Mississauga's City Centre;
- Modal shifts from local roads and current and planned transit services;
- Future growth in suburban travel demand that cannot be accommodated by Highway 401 and other roads due to road traffic congestion;
- Toronto drivers whose trip origins and/or destinations are near Hwy 401, principally on intersecting arterial roads; accessibility to transit is enhanced once the use of e-bikes and e-scooters becomes more widespread;
- Car drivers who use the Don Valley Parkway and Highway 427 to travel downtown but who would, via a 401RT, have quick access to the eastern and western segments of the Line 1 subway, the extended Ontario Line, and the Scarborough extension of the Bloor-Danforth subway;
- Drivers from north of Toronto who use Highway 400 to access downtown Toronto and across northern Toronto who would be able to access the 401RT by using user-pay garages above the 401 at Weston and Jane stations;
- People who currently drive to the airport and its employment area from trip origins near the existing rapid transit network;
- Travelers who wish to access destinations directly at 401RT stations (such as Pearson International Airport, Pickering Town Centre, the Mississauga Airport Corporate Centre, and Scarborough Town Centre);
- Downtown residents who would have access to suburban destinations via rapid transit (GO Transit, the Line 1 subway, the Ontario Line);
- Transfers from existing nearby east-west surface transit routes (such as Sheppard Avenue, Wilson Avenue, and Ellesmere Road);

- Transfers from GO Transit: the Barrie GO Rail Line, the Kitchener GO Rail line, a slightly relocated Oriole GO Station at the Leslie subway station (the current station is at Highway 401), and possibly at Kennedy Road/Agincourt;
- Travelers whose trip origins and destinations will be near the extended Ontario Line and locations in Scarborough and Pickering that are near the 401RT;
- Future residential and commercial development over, adjacent to and near to the Highway 401 corridor and at/near off-highway stations in Mississauga;
- Residents of Mississauga's densely urbanizing city centre area who would otherwise be heavily dependent on travel by automobile to access Toronto and employment areas around Pearson International Airport;
- People who live or work close to north-south surface transit services that link to a 401RT station;
- Non-401RT users who are attracted by significantly-improved bus service frequencies on north-south arterial routes, and by shelters at every transit stop;
- People at other locations in the GTA who wish to reduce their household cost of transportation;
- People who face financial hardship caused in part by motor vehicle ownership, or who wish to reallocate transportation funds towards other household priorities;
- People who have not had access to personal transportation and would benefit from the improved access that the 401RT/OLX provides;
- Drivers and automobile passengers who are 'fed up' with the stresses and delays of daily gridlock on highways and city streets.

The fact that the 401RT would not be in a high-density urban corridor is not as important a factor as the speed and comfort of the 401RT service, its long length and linkages to other transportation services, the relatively inexpensive cost of using the service, and the frustrations of traffic congestion. As with most suburban transit nodes, boardings onto 401RT trains would be mostly via transfers from feeder bus services and adjacent commuter parking lots, where they may exist. However, significant walk-on ridership can occur at Pearson International Airport, the Mississauga Airport Corporate Centre (MACC station), Yorkdale, Yonge at Sheppard, Scarborough Centre, and Pickering Town Centre, and Mississauga's city centre.

Destinations at or near 401RT	
1 Pearson International Airport	14 Seneca College
2 Mississsuga Airport Corporate Ctr.	15 Richmond Hill GO
3 Hurontario LRT	16 North York General Hospital
4 Malton community	17 Fairview Mall
5 Employment Area	18 Stouffville GO
6 Woodbine Entertainment Centre	19 Scarborough Town Centre
7 Kitchener GO to/from Brampton	20 Centennial College
8 Downsview Park	21 Malvern Community
9 Yorkdale Mall	22 Scarborough Health Network
10 York University	23 Univy of Toronto Scarborough
11 Barrie GO	24 Toronto Zoo
12 Humber River Hospital	25 Pickering Town Centre
13 Downtown North York	26 Kennedy retail/employment area
	27 Rouge National Urban Park

Both the 401RT and GO Transit's Lakeshore Line run through, and have stations in, mostly suburban areas. GO Transit is highly successful even though transit access to GO stations is often impractical. Ridership on the 401RT is enhanced by the fact that its length is long enough to serve both shorter-distance and longer-distance travelers. Importantly, a 401RT would have no rapid transit competition – it is significantly distant from the Eglinton Crosstown LRT, filling a critical void in the transit network, and is unique.

Quantifying new transit trips for the 401RT:

Because of the uniqueness of the 401RT, no comparable ridership forecasting methodology was found. However, it is estimated that the 401RT itself would generate 123,000,000 ***new*** transit trips

per year after it becomes fully operational. The estimate is partly based on the Ontario Ministry of Transportation's 2011 Transportation Tomorrow Survey's origin-destination matrix for trips by residents by automobile for 24 hours for 44 Wards (those in effect prior to 2018) in Toronto plus 16 close-by Wards in neighbouring municipalities, and was adjusted to 2041 and 2051 for population growth. Modal shift factors to transit were assigned based on the proximities of trip origins and destinations to the Highway 401 corridor and by length of trip. Additional ridership was added for increased road traffic congestion resulting from travel demand growth beyond 2041, new high-density urban development assumed to occur at and near 401RT stations, trips to/from Toronto by residents living beyond the 60 Wards, positive impacts on GO/RER ridership, the effect of direct access to Pearson International Airport from across Toronto, and driving costs.

401RT Ridership Estimate

119,000	Daily new 401RT trips 2041 by residents: modal shifts by auto driver and passenger
20,000	Incr in daily Sheppard Subwy ridership
7,000	Non-resident trips to/from 401RT (travelers living outside the 60 Ward survey area)
146,000	
308	Annualization factor
45,000,000	New transit trips from auto driver & psngr
16,000,000	New urban development at/near/above 26 401RT stations; @ higher transit % share
61,000,000	
16,000,000	Est. incr. in 401RT trips from GO RER intersects
77,000,000	
26,000,000	Add'l. congestion shift to 401RT 2041 to 2051 (Hwy unable to carry demand growth).
8,700,000	Estimated reduction in 90% auto share of air passenger trips to/from Pearson
111,700,000	Total
1.05	Driving cost Increases (tolls, energy, other)
1.05	Other factors
123,100,000	**TOTAL - New TTC Riders using 401RT by 2051**
43,000,000	Bus component: New non-401RT ridership
166,100,000	
16,000,000	GO Transit ridership increase re 401RT interse
182,100,000	Estimated total effect of 401RT by 2051
10,000,000	Ontario Line extension – new ridership

For most people, accessing the 401RT will require better bus services on intersecting arterial roads. Costings for the 401RT includes 600 additional buses. Ridership on bus routes that intersect with the 401RT would increase for trips not involving a transfer to or from the 401RT itself. This would be due to improvements in service frequencies, a mix of express and local services, shelters at ***every*** bus stop, and more comfortable buses. It is estimated that overall ridership intensity on intersecting bus services would increase by 20%, and total 43 million by 2051. Bus ridership increase estimates are preliminary and should be further reviewed.

The Ontario Line extension (OLX) north of Eglinton East is estimated to generate 10 million new transit user trips per year, plus transfers from existing transit routes, such as Don Mills Road and Victoria Park Avenue bus services. OLX ridership is adjusted for population growth to 2051, a portion of Don Mills bus ridership, plus a 25% modal shift of daily Don Valley Parkway traffic volumes between Don Mills and Highway 401. **The OLX is essential** if overcapacity problems on the Yonge Street subway segment of the Line 1 subway in Toronto are to be avoided, while still encouraging new transit ridership on the Yonge Street subway. The OLX, aligned with Don Mills Road, is included in the Ontario Government's GGH Transportation Plan commitments.

The overall effect of implementing the 401RT/OLX rapid transit lines, combined with the implementation of current rapid transit commitments and plans by the Ontario government, would be a reduction of approximately 700,000 daily automobile trips in Toronto by 2051, compared to 2023. Appendix 2 provides more information. The figures include a 3.1% reduction factor for work-at-home impacts.

More can be done in addition to the transit initiatives included in this document, including a west-and-north extension of the Ontario Line, a new LRT to divert travelers coming into Toronto on the Gardiner Expressway, and perhaps transit measures.

Operating Revenue-to-Cost Ratios

Annual operating costs for the completed 401RT/OLX and expanded feeder bus services would be approximately $632million annually, based on $8 million for each of 44 new stations (compared to an estimated $4.2 million for each of the new Spadina subway extension stations), and $450,000 for each new bus on intersecting transit route. Overall, it is estimated that fare revenues would offset 87% of operating costs. Fares are based on $2.50 for bus trips and $3.00 for trips on higher-order transit. No segmentation of 401RT operating outcomes has been estimated for Mississauga, Toronto, and Durham transit systems; these will vary the figures to a minor extent.

Operating Revenue-to-Cost Ratios

	401RT Rail Component	401RT Bus Component	OLX Eglinton to Sheppard	Total 401RT/OLX
No. of stations	38		6	44
No. of buses		624		
Unit operating cost	$8,000,000	$450,000	$8,000,000	
Total Cost	$304,000,000	$280,800,000	$48,000,000	$632,800,000
New Fares 2051*	137,700,000	44,000,000	9,900,000	191,600,000
Average fare	$3.00	$2.50	$3.00	
	$413,100,000	$110,000,000	$29,700,000	$552,800,000
Surplus or Deficit	$109,100,000	-$170,800,000	-$18,300,000	-$80,000,000
				87%

*Excludes 16m new transit users on GO Transit (4 intersects with 401RT)

Urban Development Effects

The alignment of the 401RT provides opportunities for development and redevelopment at or near most stations. Off-highway stations, such as the Scarborough Town Centre area, at/around Pickering Town Centre and the planned Woodbine/Hwy 27 GO station, are near lands that may be underutilized and may generate both residential and non-residential opportunities.

Development potential exists adjacent to many stations that are in the highway 401 corridor, within a five- to ten-minute walk from station entrances. In addition, development rights over the highway and over highway stations can be sold or leased. The government of Ontario can or may offer opportunities for private development at new subway stations, if building developers fund the capital costs of the stations themselves. This already occurs for new GO Rail stations.

Unaffordable Not To Do

The costs of traffic congestion in the Greater Toronto and Hamilton Area are oft-quoted, totalling billions of dollars a year, with ranges from $1.5 billion to $11 billion per year, based on pre-COVID-19 traffic volumes. Even with increased work-from-home situations, traffic volumes are increasing from pandemic period volumes as the GTA's population continues to increase. Unless significant new investments in rapid transit are made, Toronto's congestion problem will continue as travel demand continues to grow. Implementation of current rapid transit plans by Metrolinx and others are likely to fall short of road traffic demand to 2051, especially beyond 2051.

As mentioned, major modal shifts to public transit are necessary as part of efforts to stabilize the effects of rapid climate change. Although electricity-powered vehicles are touted as the solution to transportation-source GHG emissions, it assumes that mining for minerals needed for vehicle

production, the fabrication of auto parts and the assembly of vehicles will all be environmentally benign; it is also unlikely that the sources of electricity will be generated without GHG emissions. The body of scientific evidence pointing to rapid deterioration of the Earth's natural life support systems is conclusive. The United Nations Intergovernmental Panel on Climate Change warns that global greenhouse gas emissions need to be cut in half by 2030 if devastating and unstoppable consequences for humankind and the biosphere are to be avoided. For North Americans, who are among the world's worst emitters of greenhouse gases, much more than half of GHG emissions should be eliminated by 2030. **This is critical information.** **Refer to Appendix 1 for more information.** There is general agreement that, for urban areas, the solution for both environmental stability and avoiding road congestion lies with massive transfers of daily trips to mass transit, reductions in the number of motor vehicles, and major progress in building pedestrian-oriented urban environments. A 401RT, an extended Ontario Line, and other new transit initiatives are ***essential*** if GHG emissions are to be reduced.

Based on a broader definition of affordability – beyond the narrow public budgetary definition – not building the 401RT and an extension of the Ontario Line to Sheppard Avenue East *is unaffordable*. Detailed feasibility and impact studies should begin now.

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Appendix 1 - Rapid Climate Change

The Devastating Blows to Survival from Rapid Climate Change

Climate change is happening now, hundreds of times faster than natural changes in the past. It has consequences that will dramatically damage us in our lifetimes, and become far, *far* worse for our children and grandchildren.

An indication of a frightening global change is in the past: 250 million years ago, the Permian-Triassic extinction that left only a few species of life on earth alive was caused by rising carbon dioxide in earth's atmosphere, and also by huge releases of methane, resulting in a 5° Celsius warming of the planet. We are adding carbon dioxide into the atmosphere at a rate that is, by and large, ten times faster, and humanity is also now causing methane to be released from permafrost. There is right now a third more carbon in the atmosphere than at any time in the last 800,000 years*.

The rapid destabilization and heating of the earth requires actions much greater in scale than are currently planned, and they must be undertaken ***now***. The UN's Intergovernmental Panel on Climate Change (IPCC), reflecting the conclusions of thousands of scientists around the world, said bluntly in October of 2018 that unless global GHG emissions are cut by 40% to 45% by 2030 (now just 10 years away), we will not be able to limit global heating to 1.5° Celsius above pre-industrial norms, and will face devastating consequences.

Instead of decreasing, global GHG emissions are still rising. The 1.5°C. target will be exceeded by between 2030 and 2052*. ***According to the IPCC, current nationally stated commitments to cut GHGs, if achieved, will result in a 3.2° increase in global temperatures by 2100, and higher beyond that***. If we do not meet those reduction targets, the 2100 average temperature increase will be more than 4°, very close to the levels of 250 million years ago. Temperatures in northern latitudes will be higher – possibly 7 or 8 degrees. **This will be devastating for Canada and other countries.** Because North Americans produce a very disproportionate share of global GHG emissions, GHG emissions in North America need to decrease to almost *zero*.

Rapid global warming of 3.2° will have the following devastating and inter-connected impacts. Each of us will be affected as temperatures move rapidly higher to that level by 2100.

1. Every natural ecosystem will be at risk of collapse, and many will have collapsed.
2. There will be a much higher frequency of droughts and precipitation deficits, and lasting for longer periods. This will affect food production; food prices will be much higher than today, where food is available.
3. Extreme heat events will become normal, and will last longer. Costs to cool buildings will more than double. The mid-latitudes (including southern Canada, much of the USA, the Mediterranean, central Europe) will experience an average rise of 4° Celsius (7.2° Fahrenheit).
4. Heat-related morbidity and deaths will multiply, and be especially deadly in low latitude countries. Conflicts and economic dislocations will become widespread.
5. The loss of livestock and declines in livestock health will affect prices and human diets everywhere.
6. The number of wildfires will multiply and be more widespread. Controlling them will become more difficult, and drain public finances. The devastating fires in Australia, at the beginning of its 2019 summer season, is a current example.
7. Rising temperatures and dryness in parts of the USA will make much of its southern regions unlivable by 2100. Canada will experience a massive flow of climate refugees that will strain our ability and desire to accommodate them.
8. Heating and habitat loss will decimate plant, insect and other animal populations. Rates of extinction will accelerate beyond already extreme rates.

9. Arctic and Antarctic ice will continue to melt, at a more rapid rate than is happening now, and will not stop. Sea levels will rise by metres (6 metres once all of Greenland becomes ice-free), to the point that coastal cities will become at least partially flooded, and today's coastal marshes will be lost.
10. By 2100, almost all ocean beaches will have disappeared.
11. Less arctic ice means more heat from the sun will be absorbed into the oceans, creating a feedback loop that will melt more ice.
12. Permafrost is thawing *now*, emitting billions of tons of methane, a greenhouse gas 20 to 25 times more powerful as a GHG than carbon dioxide. The permafrost will thaw faster, and may never freeze again. A feedback loop is already occurring that will accelerate global heating.
13. Boreal forests will be degraded, and some will be lost.
14. Vector-borne diseases will migrate with climate changes.
15. The ocean is becoming and will become more acidic, and will experience oxygen loss. Coral reefs will face total die-off. Populations of fish dependent on them will, in turn, decline. Food production from fishing and aquaculture will drop. Land animals will become a greater source of food in many regions; extinction rates of land animals will increase.
16. Armed conflicts will increase as famine and human-caused disasters spread. North America will likely not be without some strife. Military costs and emergency aid to other countries will increase.
17. National, regional and local economies will be strained as more financial resources are allocated towards adaptation and mitigation of climate events and trends. Employment dislocation and poverty rates will increase (with artificial intelligence systems as an additional factor), constraining the ability of governments to keep up with its social costs. Enforcement of laws to limit crimes of desperation will be more difficult. Politically-driven tax cuts to offset increased household costs of climate change will cripple the ability of governments to keep up with change. Delays in moving to net-zero carbon energy production will make necessary actions more difficult to undertake.
18. Political and monetary pressure from fossil fuel industries will make a rapid transition to energy based on non-fossil fuels very difficult, and perhaps dangerous (How far will fossil fuel energy producers go to protect their industries?).
19. A multitude of small regional and local effects will require solutions.

Adequacy of action is and will be constrained by denials of the existence and/or severity of the scientific evidence and, unfortunately for some, climate change has become politicized, **at the expense of our children's future well-being**.

* Per sources identified in the book "The Uninhabitable Earth: Life After Warming", by David Wallace-Wells.

Appendix 2 – A Scenario of Effects of Transit Initiatives (scalable)

Estimates of Daily Trips in Toronto			Automobile + Trucks	Municipal Transit	GO Transit	Other	Total
Modal split, per 2016 TTS, for Toronto residents		Transit	57%	27%	1%	15%	100%
		Millions/Year	Daily	Daily	Daily	Daily	Daily
Daily trips by mode, Toronto residents, 2051 estimate*		582	4,705,000	1,890,000	79,000	1,178,000	7,850,000
2051 daily trips in Toronto by non-Toronto residents		18	494,000	59,000	29,000	6,000	588,000
Less 2051 travel in Toronto re work-from-home	5.0%		(260,000)	(97,000)	(30,000)	-	(387,000)
Increases in active transportation (denser mixed use areas)	25%		(88,000)	(88,000)		177,000	1,000
Commercial vehicle trips (included in Non-Resident Trips)			669,000				669,000
Total trips in Toronto - 2051 (rounded)			**5,520,000**	**1,764,000**	**78,000**	**1,361,000**	**8,721,000**
2023 trips by Toronto residents			3,507,000	1,322,000	57,000	862,000	5,748,000
2023 trips by non-residents			362,000	43,000	22,000	4,000	430,000
2023 commercial vehicle trips			490,000	-	-	-	490,000
Less 2023 estimate for work-at-home			(193,000)	(68,000)	(29,000)	-	(290,000)
2023 trips in Toronto, adjusted		Auto+Truck	4,166,000	1,297,000	50,000	866,000	6,378,000
Increase in total trips by 2051, before major transit initiativ		**417.0**	**1,354,000**	**467,000**	**28,000**	**495,000**	**2,343,000**
Add major funded rapid transit enhancements:		Transit trips					
GO Transit Enhancements (net; to 190m by 2051)		172.5	(560,000)		560,000		0
Spadina Subway extn. into Vaughan		8.0	(26,000)	26,000			
Eglinton Crosstown LRT		16.0	(52,000)	52,000			0
Finch West LRT Humber Coll to Spadina/York subway		5.9	(19,000)	19,000			0
Est. increase in transit trips arising from the 2019 Ontario rapid transit plan:							0
Ontario Line University Ave. to Pape Stn.		25.9	(84,000)	84,000			0
Ontario Line Pape Stn. To Eglinton East	49.6	12.9	(42,000)	42,000			0
Ontario Line University Ave. to CNE		10.8	(35,000)	35,000			0
Eglinton West LRT Mt. Dennis to Renforth	68.6	3.7	(12,000)	12,000			0
3-Stop Scarborough Subway to Sheppard East		11.6	(38,000)	38,000			0
Yonge subway extn. to Richmond Hill		3.7	(12,000)	12,000			0
Hurontario LRT (assumed as 100% in Peel; 7.7m new/year)		-	-	0			0
Effect of listed transit enhancements		**270.9**	**(880,000)**	**320,000**	**560,000**	-	-
Other transit plans to 2051 (GGH Transportation Plan):							
Finch West LRT extension to Yonge		1.8	(6,000)	6,000			
Finch West LRT Humber College to Pearson		1.0	(3,000)	3,000			
Eglinton West LRT Renforth to Pearson		2.2	(7,000)	7,000			
Eglinton East LRT Kennedy to Malvern to Sheppard		4.0	(13,000)	13,000			
Sheppard Subway extension to McCowan		7.7	(25,000)	25,000			
Jane Street LRT		4.5	(15,000)	15,000			
Steeles Ave - Pioneer Vill to McCowan & Sheppard (uncertain		7.9	(26,000)	26,000			
Waterfront West LRT		5.5	(18,000)	18,000			
Waterfront East LRT		1.8	(6,000)	6,000			
Ontario Line - Sheppard East to Richmnd Hill Hub		4.6	(15,000)	15,000			
Scarborough-Durham BRT		0.9	(3,000)	3,000			
Dundas BRT - Kipling to West Mall		4.9	(16,000)	16,000			
Net change in daily trips in Toronto, by 2051		**317.9**	**(1,033,000)**	**473,000**	**560,000**	-	-
SUMMARY:		Transit Trips					
Daily trips in 2051 before current approved transit initiatives		**567.3**	5,520,000	1,764,000	78,000	1,361,000	8,721,000
Effect of current approved transit initiatives		**304.0**	(1,033,000)	473,000	560,000	-	-
No. of daily trips in 2051 after approved transit initiatives		**871.0**	4,487,000	2,237,000	640,000	1,522,000	8,979,000
2023 trips in Toronto, adjusted (per above)		**414.9**	4,166,000	1,297,000	50,000	866,000	6,378,000
Change from 2023 - Number of daily trips in Toronto		**456.1**	**321,000**	**940,000**	**590,000**	**590,000**	**2,601,000**
Percent Change - 2023 to 2051		**109.9%**	**7.7%**	**72.5%**	**1180.0%**	**68.1%**	**40.8%**
Resultant Modal Shares of All Daily Trips		Transit Trips	52.4%	24.4%	7%	17%	100%
Recommended additional transit infrastructure:							
401RT - Pickering Town Ctr. To Miss'ga city centre(rail)		121.7	(395,000)	395,000			0
401RT - Additional buses intersecting with 401RT		44.0	(143,000)	143,000			0
401RT - Additional ridership from GO Rail intersects		16.0	(52,000)	52,000			0
Total for 401RT	0.25	181.7	(590,000)	590,000			0
Additional effect of 401RT-GO links on GO ridership		16.0	(52,000)		52,000	0	0
Ontario Line N extn: Eglinton to 401RT & to Sheppard E		9.9	(32,000)	32,000			0
Increases in active transportation		(27.3)	(88,500)	(88,500)	-	177,000	-
Effect of recommended transit infrastructure		**180.3**	**(762,500)**	**533,500**	**52,000**	**177,000**	-
Less GGHTP rapid transit not needed (duplicative):							
N.B. Improved bus services plus the 401RT will reduce new transit trips from these initiatives.							
Eglinton West LRT Mt. Dennis to Renforth – under construction			-	-			
Eglinton West LRT Renforth to Pearson		(2.2)	7,000	(7,000)	0	0	0
Eglinton E LRT Kingston Rd to Malvern to Sheppard		(5.7)	19,000	(19,000)	0	0	0
Sheppard Subway extension to McCowan	-18.7	(6.2)	20,000	(20,000)	0	0	0
Jane Street LRT		(3.7)	12,000	(12,000)	0	0	0
Scarborough-Durham BRT		(0.9)	3,000	(3,000)	0	0	0
Impact of Work-from-home	0.0%	-	-	-	-		0
Sum of Unneeded/Duplicative initiatives		**(18.7)**	**61,000**	**(61,000)**	**-**	**0**	**0**
SUMMARY:							
Total trips in Toronto by 2051 before transit initiatives			5,520,000	1,764,000	78,000	1,361,000	8,723,000
Effect of current transit enhancements		317.9	(1,033,000)	473,000	560,000	-	-
Effect of recommended additional transit infrastructure		180.3	(762,500)	533,500	52,000	177,000	-
Effect of unneeded/duplicative transit infrastructure		(18.7)	61,000	(61,000)	0	0	0
No. of daily trips in Toronto in 2051 after all initiatives		**479.5**	**3,785,500**	**2,709,500**	**692,000**	**1,184,000**	**8,723,000**
No. of daily trips in Toronto in 2023			4,166,000	1,297,000	50,000	866,000	6,378,000
Change in daily trips, 2023 to 2051		**479.5**	**(380,500)**	**1,412,500**	**642,000**	318,000	2,345,000
			-9.1%	**109%**	**1284%**	**37%**	**37%**
Changes in trip mode		**161.6**	**(701,500)**	**472,500**	**52,000**	**177,000**	-

Transit trips are ***new*** transit trips, the critical measure of change

* For Municipal transit, it is assumed that the TTC will undertake a variety of local enhancements over years to existing TTC services, such as adding buses & more trains to existing routes. Excludes new subway/LRT routes or extensions.

Appendix 3

Why a 401RT? – Answering Concerns, and Rescuing Highway 401

August 2021

An east-west cross-boundary rapid transit line across the northern half of Toronto is essential to the Toronto area's economic and social prosperity and environmental sustainability. Its absence is a costly handicap to progress. It has been presented as a "401RT" extending from Pickering Town Centre to Mississauga city centre, with up to 38 stations over a 67-kilometre length (including its Sheppard subway segment). Although a great deal of work is now underway on other rapid transit initiatives, it is important that w***ork to study the feasibility and impacts of a 401RT begins now.***

Although the Eglinton Crosstown LRT and expansions to GO Transit are underway, and plans for new subway and LRT lines have been approved, the scale of what is needed to cut road traffic congestion and Its costs is being missed, and measures being taken to date are a collection of piecemeal actions.

Concerns of those who are skeptical of the 401RT idea as workable and important for Toronto are addressed here:

1. The suburbs are not the place for subways; ridership will not be enough.

Several factors will make a 401RT operationally viable:

- Over many decades, jobs and people have gravitated towards locations near Highway 401 or are along major arterial roads that intersect with the highway.
- Transit connections contribute to making it work. A 401RT will create potentially up to ten north-south rapid transit connections, and connect with more than 100 intersecting bus routes.
- The 401RT would deliver many people close to final daily destinations (for example, Pearson International Airport, Mississauga City Centre, and Scarborough Town Centre).
- Comparatively, GO Transit operates almost all its rail stations in the suburbs and is an operational success; about 96% of its riders go to a single high-density stop (Union Station), whereas the 401RT will deliver travelers to many significant destinations.
- Many people today are forced to drive a car because of the absence of east-west rapid transit in northern Toronto, and would welcome an alternative. Affordability of ownership and operation of personal automobiles has become and will be difficult for many thousands of households. Annually, using transit may cost $2,000, while a personal automobile may cost $5,000 to $10,000 per year.
- Estimated ridership for the 401RT and GO Transit impacts is 182 million new transit trips per year; the Ontario Line extension north of Eglinton East will add another 10 million new transit trips per year. An extension of the Ontario Line north of Eglinton Avenue East is necessary to avoid adding to congestion on the Yonge subway.

3. The Ontario government is already doing what it can to reduce road traffic congestion in the GTA.

- No, it is not. Politically-determined budget decisions constrain what is done and what can be done.

- Current transit initiatives funded by Ontario – the Eglinton LRT, GO Transit expansion, Ontario's subway/LRT plan and GGH Transportation Plan are necessary; however, while altogether they may generate a significant number of new transit trips per year, the total number of motor vehicles on Toronto's roads will remain approximately the same (see Appendix 2). A 401RT across the northern half of Toronto and an Ontario Line extension to Sheppard East will reduce the use of automobiles in Toronto by close to 200 million trips per year, compared to 2016 levels.
- The key to real cuts to road traffic congestion is to maximize modal shifts, but most users of the Eglinton LRT and new subways and LRTs will be transfers of existing transit riders from current transit services. Ontario's should focus on more modal shifts.
- Some of the rapid transit projects planned for Toronto will need to be re-evaluated in light of the diversion of trips from them to a faster and better 401RT. The projects that will become operationally non-viable are the Sheppard Subway eastern extension, the Eglinton LRT's eastern and western extensions, and the Jane Street LRT.

4. We can't afford it. There's a deficit and taxes are already too high.

- Failure to adequately address road congestion is much less affordable. Estimates of the cost of congestion in the Toronto area are in the billions of dollars per year, borne by households and businesses. 1.8 million people in cars and trucks on Highway 401 between Hurontario Street and Liverpool Road suffer from congestion and car costs ***now***, and that is unaffordable.
- The gross infrastructure cost of the 401RT is $24 billion for a mostly-elevated 401RT, plus the $3.8 billion Ontario Line extension from north of Eglinton Avenue East to Sheppard Avenue East. These costs can be partially offset by the federal share of 40% of gross costs, and not building the Eglinton East LRT beyond Eglinton Avenue, the Sheppard subway extensions, all or part of the Eglinton West LRT, and the Jane Stret LRT.
- If the 2019 Ontario Plan for Rapid Transit for Toronto is considered worthwhile, a 401RT/OLX is much more so – the 401RT is more than twice as cost-effective, based on cost per new transit user.
- Whether taxes are too high is a subjective opinion, based on the degree to which people have prioritized their after-tax incomes. If the cost of the 401RT/OLX is $27.8 billion, the average daily cost to Toronto households to carry that as debt would be 16 cents, less savings of up to 9 cents from unneeded rapid transit projects not built.
- ***It makes sense to undertake the 401RT analyses now***, so that construction can begin when the time is right, such as when job-creation measures are especially needed, as during an economic recession, or when current project work begins to wind down.
- Up-front analyses cost relatively little.

5. The northern parts of Toronto will be well-served by the Eglinton Crosstown LRT, especially when it is extended.

- The Eglinton Crosstown LRT is geographically within the southern half of Toronto. The northern half of Toronto and several adjacent Wards in the '905' area is home to 1.3 million people and over 400,000 jobs – including part of the airport employment megazone around Pearson International Airport, and the airport itself. Under current plans, northern Toronto will remain very poorly served by east-west rapid transit.

- It should be noted that the essential 401RT would render the Sheppard Subway extension, Jane Street LRT, the eastern extension of the Eglinton Crosstown LRT, and the Phase 2 Eglinton LRT link to Pearson unnecessary, while with those rapid transit lines a 401RT is still necessary – in other words, building those transit lines will be a duplicative mistake. (An Eglinton Crosstown LRT extension to Kingston Road, and no further would be useful.)

6. There would be too much disruption during construction.

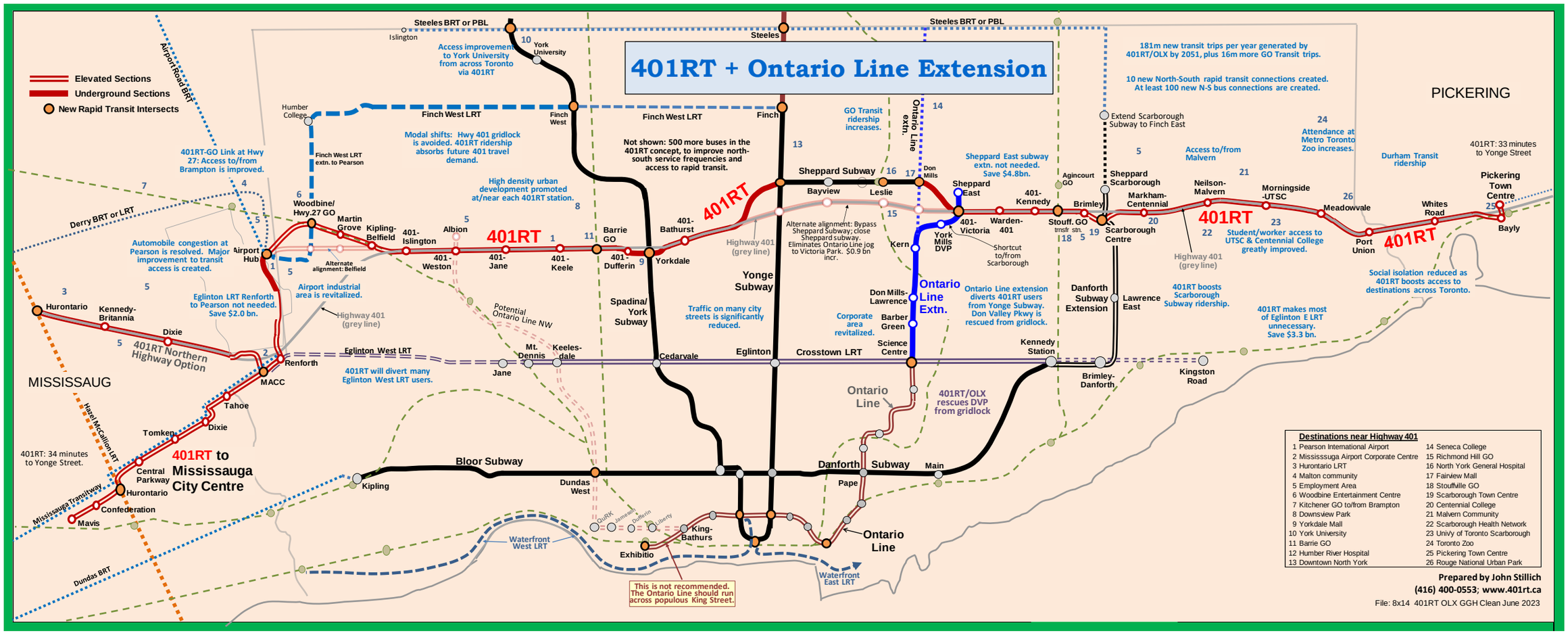
For a Mostly-Elevated 401RT (preferred):

- Without a 401RT, locking Toronto into permanent disruptions due to growing congestion and gridlock will be much worse. That must ***not*** be allowed to happen. It may also be true that a few years of construction for a 401RT is not much different than delays that occur now.
- Most of the 401RT's alignment in the highway corridor will be over the eastbound collector lanes only; as much as possible, the 401RT will veer to be above the on- and off-ramps next to the collector lanes, reducing collector lane closures.
- Work on building a 401RT should begin before highway volumes increase further; delays will make construction more difficult and congestion temporarily worse.
- Ground-level disruptions can be limited to the construction of the pillars that support the transit line and for stations. Work can be scheduled to avoid peak hour highway volumes.
- Off-highway segments include tracks and stations above existing railway tracks, the Mississauga Transitway, Burnhamthorpe Road, Silver Dart Road, and Liverpool Road.
- Construction can begin with tunnelled segments (to/from Sheppard Subway, Yorkdale, Airport Road).

For a mostly-at-grade 401RT:

- Construction can begin with off-highway segments requiring tunneling, including to/from: Pickering Town Centre, Scarborough Centre, the Sheppard Subway, Yorkdale station, the off-highway diversion to/from Pearson, and the Mississauga Airport Corporate Centre.
- Once tunneled segments rise onto the surface of the 401, multiple construction companies can construct and complete the on-highway stations and at-grade tracks between stations. However, some construction by private developers of multi-level buildings above the highway that envelop stations may require several years to build.
- During construction, the TTC can provide special east-west express bus services to/from key destinations.

A full-length east-west rapid transit line from Pickering Town Centre and Mississauga City Centre across the northern half of Toronto and an extension of the Ontario Line north of Eglinton East to Sheppard Avenue East at Victoria Park Avenue will rescue the Highway 401 transportation corridor and the Don Valley Parkway from becoming non-functional for extended periods of time each day, and will transform transportation across the region. A 401RT and Ontario Line extension are inevitable, and need a full detailed analysis by transportation agencies on an urgent basis.


401RT + Ontario Line Extension
Elevated Sections
Underground Sections
New Rapid Transit Intersects
Steeles BRT or PBL
Islington
Steeles
Access improvement to York University from across Toronto via 401RT
York University
Airport Road BRT
Humber College
Finch West LRT
Finch West
Finch
Finch West LRT extn. to Pearson
Modal shifts: Hwy 401 gridlock is avoided. 401RT ridership absorbs future 401 travel demand.
Not shown: 500 more buses in the 401RT concept, to improve north-south service frequencies and access to rapid transit.
GO Transit ridership increases.
Ontario Line extn.
Extend Scarborough Subway to Finch East
181m new transit trips per year generated by 401RT/OLX by 2051, plus 16m more GO Transit trips.
10 new North-South rapid transit connections created. At least 100 new N-S bus connections are created.
PICKERING
401RT-GO Link at Hwy 27: Access to/from Brampton is improved.
High density urban development promoted at/near each 401RT station.
Sheppard Subway
Sheppard East subway extn. not needed. Save $4.8bn.
Access to/from Malvern
Attendance at Metro Toronto Zoo increases.
Durham Transit ridership
401RT: 33 minutes to Yonge Street
Derry BRT or LRT
Woodbine/ Hwy.27 GO
Martin Grove
Kipling-Belfield
401-Islington
Albion
401RT
Barrie GO
401-Bathurst
Bayview
Leslie
Don Mills
Sheppard East
401-Kennedy
Agincourt GO
Sheppard Scarborough
Markham-Centennial
Neilson-Malvern
Morningside-UTSC
Meadowvale
Whites Road
Pickering Town Centre
Bayly
Automobile congestion at Pearson is resolved. Major improvement to transit access is created.
Airport Hub
Alternate alignment: Belfield
401-Weston
401-Jane
401-Keele
401-Dufferin
Yorkdale
Highway 401 (grey line)
Alternate alignment: Bypass Sheppard Subway; close Sheppard subway. Eliminates Ontario Line jog to Victoria Park. $0.9 bn incr.
401-Victoria
Warden-401
Stouff. GO
Brimley
Scarborough Centre
Student/worker access to UTSC & Centennial College greatly improved.
Port Union
Social isolation reduced as 401RT boosts access to destinations across Toronto.
Airport industrial area is revitalized.
Eglinton LRT Renforth to Pearson not needed. Save $2.0 bn.
Yonge Subway
Spadina/ York Subway
Potential Ontario Line NW
Traffic on many city streets is significantly reduced.
York Mills DVP
Kern
Shortcut to/from Scarborough
Don Mills-Lawrence
Barber Green
Corporate area revitalized.
Ontario Line Extn.
Ontario Line extension diverts 401RT users from Yonge Subway. Don Valley Pkwy is rescued from gridlock.
Danforth Subway Extension
Lawrence East
401RT boosts Scarborough Subway ridership.
401RT makes most of Eglinton E LRT unnecessary. Save $3.3 bn.
Hurontario
Kennedy-Britannia
Dixie
401RT Northern Highway Option
Renforth
MACC
Eglinton West LRT
401RT will divert many Eglinton West LRT users.
Mt. Dennis
Keeles-dale
Jane
Cedarvale
Eglinton
Crosstown LRT
Science Centre
Kennedy Station
Brimley-Danforth
Kingston Road
MISSISSAUG
Tahoe
Tomken
Hazel McCallion LRT
401RT: 34 minutes to Yonge Street.
401RT to Mississauga City Centre
Central Parkway
Hurontario
Confederation
Mavis
Mississauga Transitway
Dundas BRT
Kipling
Bloor Subway
Dundas West
Ontario Line
401RT/OLX rescues DVP from gridlock
Danforth Subway
Main
Pape
Waterfront West LRT
Exhibition
King-Bathurs
QueRK
Simcoe
Dufferin
Liberty
This is not recommended. The Ontario Line should run across populous King Street.
Waterfront East LRT
Destinations near Highway 401
1 Pearson International Airport
2 Mississsuga Airport Corporate Centre
3 Hurontario LRT
4 Malton community
5 Employment Area
6 Woodbine Entertainment Centre
7 Kitchener GO to/from Brampton
8 Downsview Park
9 Yorkdale Mall
10 York University
11 Barrie GO
12 Humber River Hospital
13 Downtown North York
14 Seneca College
15 Richmond Hill GO
16 North York General Hospital
17 Fairview Mall
18 Stouffville GO
19 Scarborough Town Centre
20 Centennial College
21 Malvern Community
22 Scarborough Health Network
23 Univy of Toronto Scarborough
24 Toronto Zoo
25 Pickering Town Centre
26 Rouge National Urban Park
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