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Rapid Transit Rescue For Toronto

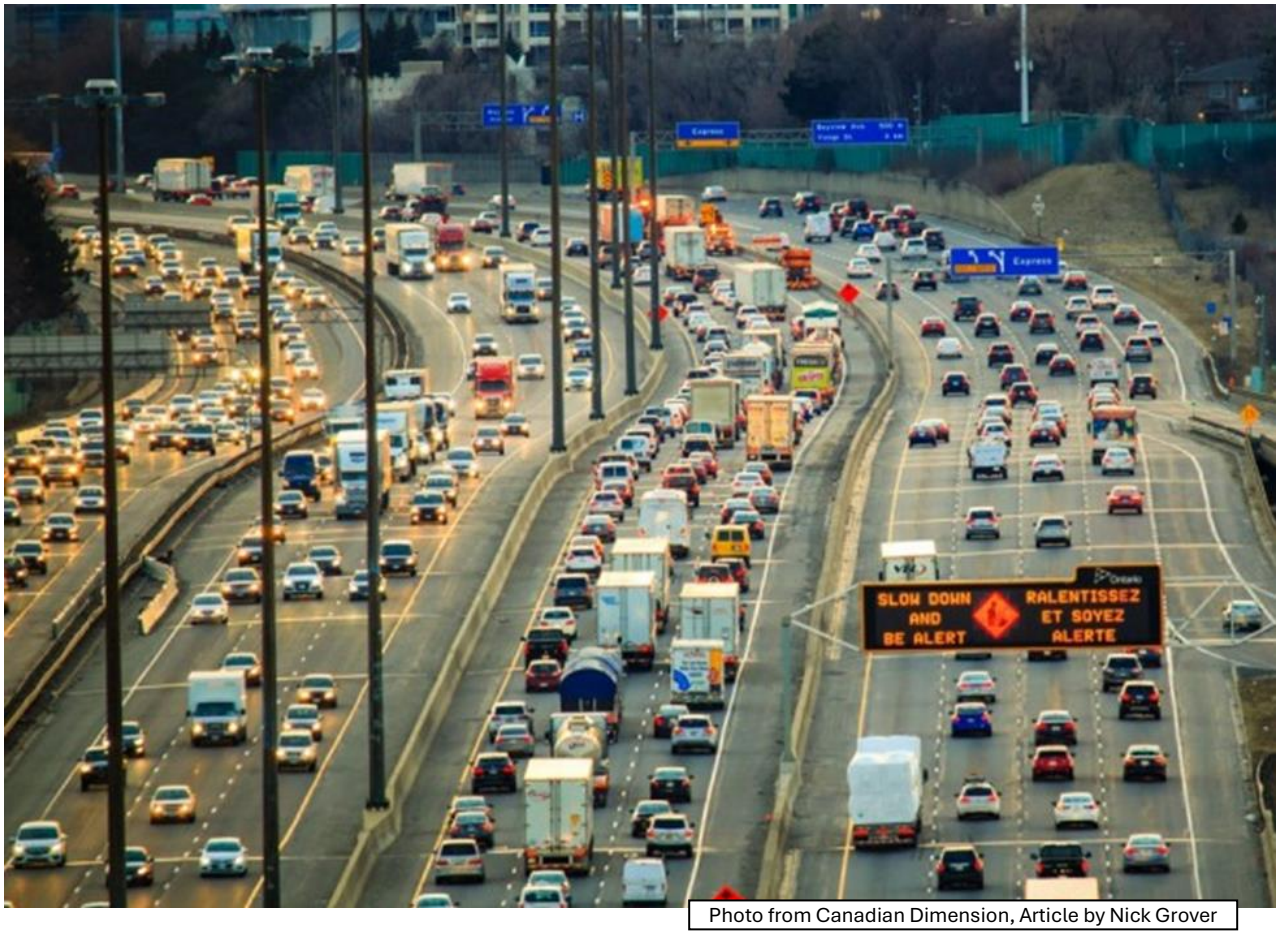


Photo from Canadian Dimension, Article by Nick Grover

Every day, more than 1.8 million people use Highway 401 in the core of the Greater Toronto Area, from Mississauga to Pickering. The flow of cars and trucks is slowing down in ever-longer peak periods, and it's not going to get better.

Population growth over the next thirty years – a million more people in Toronto alone –means that Highway 401 in Toronto will become nonfunctional for much of every day. The highway needs a relief valve to ensure that essential traffic moves efficiently across the region.

Many tens of thousands of commuters who are slogging through it dream for another way to get to where they want to go. According to transportation analysts, it now costs anywhere between $11,000 per year to buy and operate a used car, and $16,000 and more per year for a new car. It's essentially a massive hidden road toll that cuts deeply into the budgets of moderately incomed households, preventing them from investing in other priorities.

Personal relationships are affected, too. As the Toronto Star's Francine Kopun has written, relationships, family gatherings softball games and much more are falling victim to the city's gridlock.

The Ontario government is rushing to build new rapid transit lines to try to keep things moving in Toronto. The Finch West and Eglinton LRTs will be completed soon, and other projects – the Ontario Line, extensions of the Line 1 and Line 2 subways, and more GO Transit – are underway. Beyond 2030, nine more rail rapid transit expansions and bus rapid transit are planned for Toronto.

There's also an "Ontario Line Loop Connection", a long rapid transit circle line around the edges of Toronto that would be a hugely expensive undertaking that will not produce enough transit ridership to make it operationally viable.

But will rapid transit expansions keep pace with travel demand growth? If everything in the Greater Golden Horseshoe Transportation Plan (GGHTP) for Toronto is implemented, and improvements to the Toronto Transit Commission's existing services inch forward, it looks like it might – sort of, maybe. One reason it's uncertain is because about half of forecasted boardings on new rapid transit system expansions will be current transit users rather than new transit users.

Good urban planning and lots of gentle density will also help to boost transit ridership growth forecasts, and increase walking and bicycling as modes of travel.

2051 Rapid Transit Scenario (Figures in Millions)	Approx. Cost to Build	Approx. New Transit Trips per Yr.
Finch W LRT to Humber Coll	2,500	6.4
Eglinton LRT Mt.Dennis to Kennedy	12,800	19.0
Eglinton W LRT to Renforth	4,700	9.0
Ontario Line - Exhibition to Eglinton	14,000	72.4
Yonge Sbwy extn to Richmond Hill	5,600	11.4
Scarborough Sbwy to Sheppard E	5,500	13.9
GO Transit 2051	1,600	21.5
	46,700	153.5
Other Rapid Transit initiatives:		
Eglinton East LRT to UTSC& Malvern	4,650	11.0
Sheppard Subway to McCowan	4,800	6.5
Eglinton LRT Renforth to Pearson	1,200	3.9
Finch W LRT extension to Yonge	1,900	5.7
Finch W LRT extension to Pearson	1,200	1.1
Jane Street LRT	2,600	8.0
Ontario Line extn to Finch	6,900	19.5
Waterfront West LRT	1,900	13.7
Waterfront East LRT	900	2.4
Go Transit Enhancements	11,900	118.0
Varous BRT Routes	16,500	21.2
	54,450	210.9

Will it be enough just to keep pace?

But just keeping pace with congestion and its impacts won't do. Torontonians won't be happy if all that can be said in 2051 will be "Well, at least it hasn't gotten worse". That would mean unending road congestion and failure in the war on the climate crisis. Is that what Torontonians want to be giving our kids and grandkids?

True progress requires that the number of kilometres traveled by motor vehicle plunges from today's volumes. It means that fewer and shorter trips will need to be taken by fewer cars (whether gas-powered or EV). So far, we're going the wrong way.

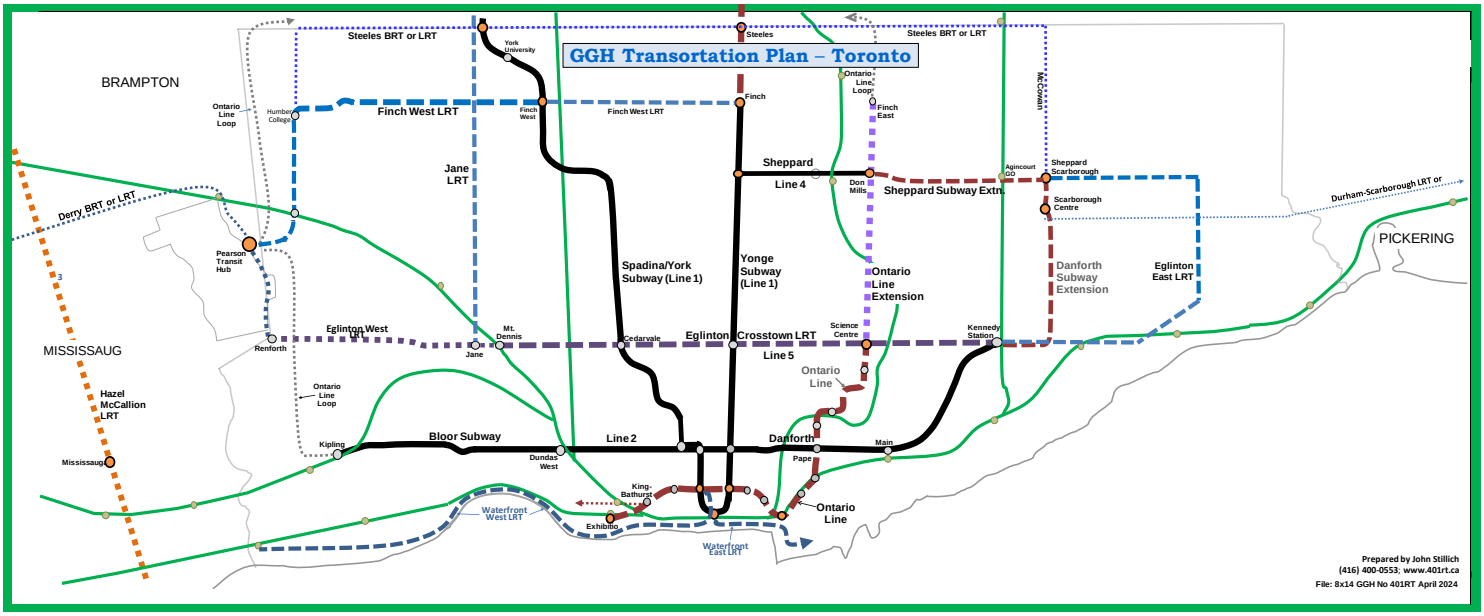
Toronto's Northern Rapid Transit Gap

The crux of Toronto's road congestion and Highway 401's slow crawl to death by strangulation lies in the dismal planning for rapid transit in the northern half of Toronto. The Toronto portion of the GGHTP is mostly a collection of scattered pieces that have been around for decades, without anything that can enable rapid travel across the whole of the northern half of the city.

Aside from GO Transit, transit planning in Toronto doesn't consider the 600,000 daily vehicle border crossings on Highway 401 to and from Mississauga and Pickering. It's assumed that traffic on Highway 401 will continue to increase, worsening the congestion on major roads in Toronto such as the Don Valley Parkway, and in the downtown core.

A stated priority of the GGH Transportation Plan for Toronto is to add road capacity to Highway 401, rather than providing a rapid transit alternative to driving across the city.

Yet a rapid transit alternative is exactly what is needed to rescue Highway 401, the DVP and other major roads in Toronto from gridlock.



There have been suggestions to widen or double-deck parts of the highway. Neither of those will work. Both would require massive property acquisitions to eliminate bottlenecks and cost billions to construct. Enormous multi-year disruptions for travelers would be created, and all that will happen is help add more cars to city streets.

High-occupancy lanes for buses have also been suggested, but that would require hundreds of buses to make a dent in traffic volumes. Moreover, the costs and complexities of hundreds of new bus routes will be daunting for transit operators and for travelers.

What do Torontonians want? Do they want more highway lanes, or do they just want – somehow – less traffic congestion, not only on the 401, but everywhere?

The only east-west rapid transit lines that exist north of Eglinton Avenue are the Finch West LRT – which will be too slow and too remote to make a noticeable difference in Toronto's traffic volumes – and the five-kilometre-long Sheppard Subway. Even if the subway's planned extension to McCowan Road happens, it will be only 13 kilometres long. Toronto is 40 kilometres wide.

For example, getting from Scarborough's Neilson Road at Ellesmere Road (near the hospital) to Pearson Internation Airport by public transit will continue to be a struggle. Even if the planned Sheppard Subway and Finch West LRT extensions are built, it will mean a bus trip to Sheppard Avenue, a wait, another bus to the Sheppard subway at McCowan, the subway ride to Yonge Street, a wait for the Yonge subway, a ride to Finch Station, a wait for the Finch West LRT, and a trip on the Finch West LRT past Humber College to the airport. Altogether, about 1 hour and 50 minutes. The Eglinton LRT, geographically in the southern half of Toronto, won't be of much help.

The only sensible way to travel will seem to be to drive to Pearson on Highways 401 and 409; however, the 401 will also be congested for most of the day.

Parking lots across the northern half of the city will remain full. The downtown core will continue to be congested with cars from Toronto's northern suburbs. As air travel continues to increase, Pearson's parking lots and garages will remain full, despite LRT extensions from Finch and Eglinton Avenues. The Don Valley Parkway and other roads will remain clogged for most of the day (even with the Ontario Line nearby). And too many households will have to bear the stifling costs of owning and operating personal automobiles, often one for every adult in the home.

Being able to get quickly to Pearson and its massive surrounding employment area from east of Yonge Street, and to Scarborough from west of Yonge, is critical.

Filling the Rapid Transit Gap

The solution seems obvious. Cutting the need to travel by automobile in Toronto from today's volumes means building an east-west rapid transit line through northern Toronto and into Pickering and Mississauga. One that's fast and comfortable enough to compete with driving across Toronto on HIghway 401. And it has to provide direct and easy connections to the both legs of the Line 1 subway, the Ontario Line (extended north of Eglinton East), the Line 2 Subway extension at Scarborough Centre, any of six GO Transit rail lines, Pearson airport and its massive surrounding employment area, and to myriad other destinations and a hundred bus connections along the way. It can be made to happen.

So, here's the vision: Altogether, this rapid transit line would stretch for 69 kilometers from Pickering Town Centre to Erindale GO station past Mississauga's populous downtown core. It's a length and seamlessness that maximizes attractiveness for commuters and for anyone who wants to get across the northern half of Toronto, or to the downtown core, or to Mississauga or Pickering. It's also about the same length as the combined rapid transit projects currently underway in Toronto, excluding GO Transit.

But where to put it? Tunneling the whole thing would take decades and cost a fortune. Nor can it run on city streets as light rail transit – service would be far too slow and be hugely disruptive. And using hydro corridors won't work either.

The best and most cost-effective location is one that is elevated above or adjacent to Highway 401's eastbound collector lanes and, west of Islington Avenue, above several other transportation corridors. In Mississauga, most of its route would be above the Mississauga Transitway.

Locating this ***"401RT Express"*** (or just 401RT) above existing corridors means there would be little property acquisition costs or neighbourhood disruptions. 75% of the lands bordering the highway are non-residential. Careful separation of the 401RT from the closest residential lands bordering the highway should minimize NIMBY (Not-In-My-Backyard) reactions. Most stations along Highway 401 would be above the on- and off-ramps along the highway's south edge. Elevating the 401RT also means it can be built much faster than tunneling, and at far less cost.

Elevated rapid transit lines are common around the world; in fact, almost all of the Ontario Line north of O'Connor Drive will be elevated above ground level.

Commuter parking is possible at both ends of the 401RT Express – by replacing the ground-level lots at Erindale GO station and the Pickering GO station with new multi-level garages.

End-to-end travel time for the 69 kilometres could be 80 minutes. It's a speed that's good enough – especially in peak periods – to entice many people out of their cars and onto transit. For example, the 401RT Express will get travelers from its Yonge Street station to Pearson International Airport in 26 minutes. Other comparisons that include time taken to get to the 401RT on buses are shown in the box on the right.

Trip Time Examples (Minutes)	
Keele at Sheppard E to UTSC:	
Using extended Sheppard Sbwy	71
Using 401RTX	66
From Scarborough Centre to Pearson:	
Using Eglinton LRT	68
Using 401RTX	45
Jane at Sheppard to Kennedy at Sheppard:	
Via Sheppard bus es + extended Sbw	44
Via 401RT	41
Neilson at Finch to Humber College:	
Usng Finch bus to Yonge + LRT	90
Using 401RT	76
St. Andrew Station to Pearson:	
Via Eglinton LRT	44
Via 401RT Express	45

Travel time for the arduous trip example between Neilson Road and Pearson airport would be cut in half, from one hour and 50 minutes to just 56 minutes. That kind of change would have a transformative effect.

With a 401RT operational, many travelers flying out of Pearson International Airport can leave their cars at home instead of fighting traffic and paying for airport parking. Friends and families won't need to drive them to or from the airport.

Crucially important is that at two-minute intervals between arriving trains, the 401RT has the potential to offset all road traffic growth on Highway 401 between Pickering Town Centre and Islington Avenue, and reduce current highway traffic volumes.

A Northwest 401RT Express

Something else needs to be fixed. Nearly every day, thousands of people get caught in the massive gridlock on Highway 401 from Dixie Road in Mississauga eastward, often to Highway 400. It's brutal and hellish, not only for the average commuter, but also for enormous numbers of trucks. The outlook is for total gridlock. Even now during peak periods, there is barely room for more traffic.

Unfortunately, the GGH Transportation Plan has no solution other than to encourage more people to drive, by adding road capacity to this part of the highway rather than by providing a rapid transit option. The myriad rapid transit initiatives already planned for Toronto will provide no measurable relief.

A "***Northwest 401RT Express***" (or simply NW401RT) is necessary and urgent. It would stretch for 21 kilometres, from Derry Road at Highway 401 in Mississauga to the 401RT station at Islington Avenue. The intent is that the NW401RT is integrated with the primary 401RT, and is a branch of the 401RT. Travelers would have the option of boarding a train in Scarborough that will take them to Pearson International Airport or downtown Mississauga, or one that bypasses Pearson and takes them to northwestern Mississauga.

The NW401RT can be entirely elevated above Highway 401 or elevated alongside it. Among its ten stations would be a junction station east of Renforth Drive that connects the NW401RT with the Mississauga Transitway, the Eglinton West LRT, and the primary 401RT Express alignment across Toronto. Large multi-level pay-as-you-go commuter parking garages over the Highway 401 right-of-way would be necessary, perhaps best at Mississauga Road and at Hurontario Street.

The benefits of the Northwest 401RT are worth more than its estimated $7.3 billion cost. It would have enough capacity to offset all non-commercial traffic growth on Highway 401 between its Derry and Islington stations through 2051, and reduce current highway traffic volumes across much of Toronto. The NW401RT's intersection with the Hazel McCallion LRT would boost ridership on that LRT. Express buses to NW401RT stations west of Dixie Road would encourage new transit use by Brampton commuters. Travel time from Derry to Islington would be a very competitive 23 minutes.

Overall, the perceived need for widening or double-decking any part of Highway 401 would end.

Success In the Suburbs

But this is in the suburbs. Rapid transit doesn't work in the suburbs. Many people think that a high-capacity rapid transit line won't work where urban densities are low. But it can. GO Transit's Lakeshore Line shows a way. It works because it brings commuters directly into Toronto's downtown core. In comparison, the 401RT Express has key destinations across all of its route, including the most noteworthy being Pearson International Airport and its adjacent employment zone, and the Line 1 subway. The NW401RT mostly serves to unclog Highway 401, although each of its stations provide significant access to local destinations. As with the two 401RT Express routes, most GO users arrive at stations by car or bus.

The two 401RT lines will entice enough new ridership to ensure their success -- their speed, continuous length and comfortable ride, high visibility above grade, central location in the core of the Greater Toronto Area, population growth, smart urban development, the increasingly unaffordable cost of personal automobiles and other costs of living, intensified bus services on intersecting arterial roads, connections to GO Transit, much easier access to Pearson and its employment area from across Toronto and from Mississauga, and latent transit demand from current Highway 401 users.

Although latent demand for an alternative to driving is important and has not been measured, it is likely that a sizable portion of today's Highway 401 users would prefer to use a viable rapid transit alternative.

Ridership on the primary 401RT Express can reach 150 million new transit trips per year by 2051 and would boost GO Transit by about 24 million, at six new 401RT/GO intersects. Increases in north-south bus transit routes that intersect with 401RT stations will attract another 52 million new transit trips per year by non-401RT users, because much better service frequencies make it easier to catch a bus for local trips.

It's a seemingly high volume of new transit trips, but not out of line with new transit trips forecasted for the much shorter Ontario Line that is south of Eglinton Avenue and competes with the Yonge Street subway. The 401RT will attract ridership from a wide swath of geography, from north of Lawrence Avenue to Steeles Avenue, and into Pickering and Mississauga.

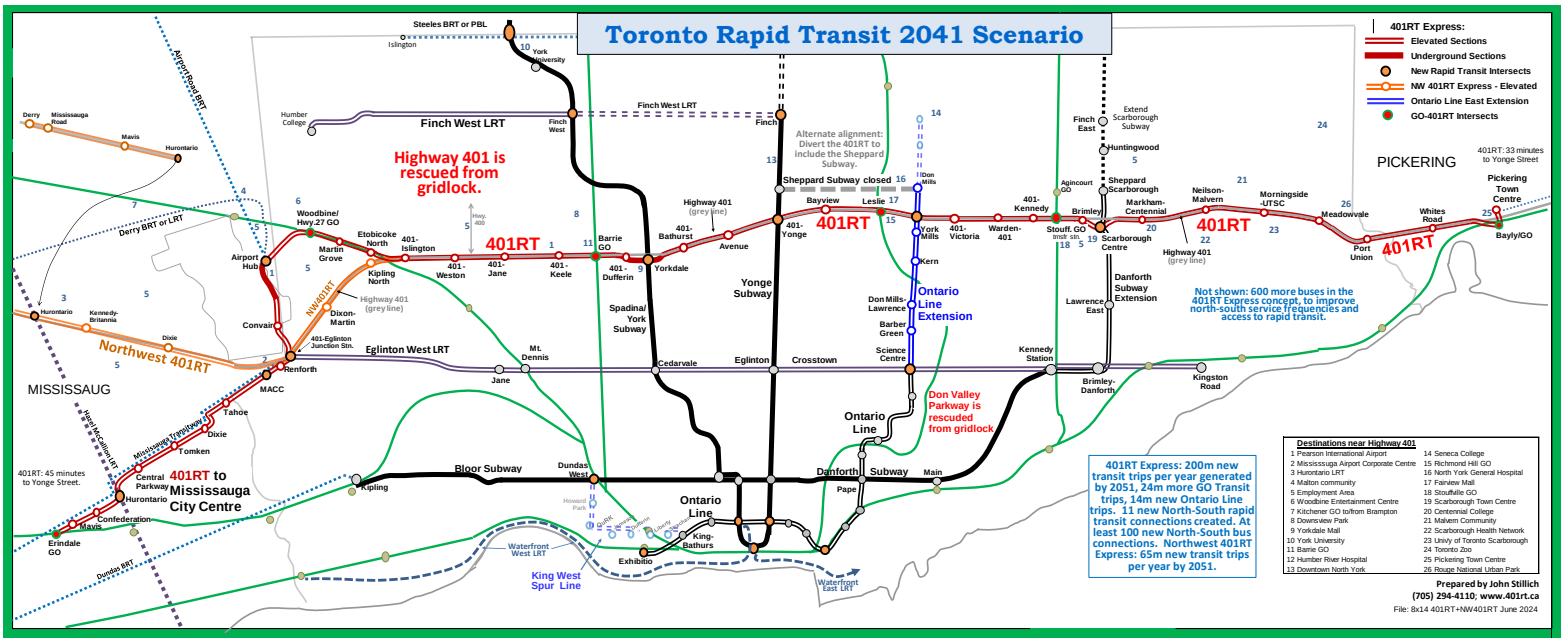
An extension of the Ontario Line from Eglinton Avenue East to the 401RT will be necessary to keep 401RT users from overcrowding the Yonge Street subway. A northerly extension of the Ontario Line past Highway 401 is already included in the GGH Transportation Plan.

401RT Express Ridership Estimate

120,000	Daily new 401RT trips 2041 by 60-Ward residents: Latent demand
5,000	Non-resident trips to/from 401RT (travelers living outside the 60 Ward survey area)
125,000	
365	Annualization
45,600,000	New transit trips from auto driver & psngr
18,000,000	New urban development at/near/above 401RT stations; @ higher transit % share
63,600,000	
24,200,000	Est. increase in 401RT trips from GO RER intersects
87,800,000	
29,300,000	Add'l. congestion shift to 401RT 2041 to 2051 (Highway unable to carry demand growth).
23,600,000	Reduction in automobile share trips to/from Pearson. (Highly variable. A low estimate)
140,700,000	Total
1.05	Driving cost Increases (tolls, energy, Household affordability & Other factors)
147,700,000	**TOTAL - New TTC Riders using 401RT by 2051**
52,000,000	Increased N-S bus services: New non-401RT ridership
199,700,000	**TOTAL INCR. FOR MUNICIPAL TRANSIT**
24,000,000	GO Transit ridership increase re 401RT interse
223,700,000	Estimated total effect of 401RT by 2051

The Northwest 401RT may generate more than 60 million new transit trips per year by 2051 – a bit more per station than the current Line 2 (Bloor-Danforth) subway. Although it has no GO Transit intersects, the NW401RT fills a vacant rapid transit gap through large employment zones east and west of Pearson International Airport, and is close to the City of Brampton in Mississauga's North.

These volumes of new transit ridership would reduce travel by motor vehicle on the heaviest-traveled segment of Highway 401, to the point that increasing the road capacity of the highway, identified as a priority in the GGH Transportation Plan, should be removed from plans.



All of this is a lot to process. It's huge. 90 new kilometres of rapid transit. 50 new stations. 13 new rapid transit connections. But it has to be done. And in reality, it's no bigger a project than the sum of rapid transit expansion projects currently underway for Toronto and Mississauga. And the 401RT and NW401RT would cost a great deal less (keep reading).

Putting the Sheppard Subway Out of its Misery

Despite many years of talk and planning about extending the Sheppard subway to McCowan Road in Scarborough, its riderhip will be relatively low. In fact, the 401RT Express will make the entire Sheppard Subway, including its proposed extension, obsolete. According to TTC statistics, people use the Sheppard subway mostly to catch a Don Mills bus, or to go to points east of the subway's Don Mills terminus. With a 401RT operating, most travelers who want to get to Yonge Street from, for example, somewhere along Markham Road, will take a bus to the nearby 401RT. ***Very importantly***, the 401RT will enable travel to or from west of Yonge Street. Closing the Sheppard Subway could mean replacing it with a seamless bus service that can run from Toronto's eastern border to Weston Road.

OMG! How is the 401RT Express Affordable?

The 401RT Express will cost up to $25 billion to build; the NW401RT will cost about $7.3 billion. No doubt, people of thrift – and perhaps most people – will argue "That's Too Much!! I can't afford this!! My taxes will go through the roof!" But Torontonians have already accepted that level of spending. The Ontario Line, Eglinton West LRT extension, Yonge North extension to Richmond Hill, the Line 2's Scarborough Subway and the Hurontario LRT already cost more than their announced $28.5 billion.

The $32.3 billion is deceptively overstated. Today's Toronto taxpayers won't be digging into their wallets to pay that much. For one thing, the cost would be carried forward by public debt; in that way, future users of the 401RT would, very appropriately, contribute to the cost. Debt financing also greatly reduces the annual cost to taxpayers.

And there's more that will bring costs down a great deal. The 401RT would mean some of the Ontario Government's GGHTP's planned rapid transit initiatives can be eliminated– including fairly high-profile

initiatives that have been around for decades and hoped for by many. Altogether, they will save about $12.7 billion in future infrastructure costs. There are five unneeded projects:

1. The proposed all-tunneled $4.8 billion Sheppard Subway extension to McCowan Road. It would run closely parallel with the 401RT and not have the ridership volumes to justify its construction. Instead of a 13-kilometre Sheppard Subway, Toronto would have the 69-kilometre 401RT.
2. Most of the proposed $4.4 billion Eglinton East LRT extension in Scarborough. It's long been thought that an eastern extension from Kennedy subway station to the University of Toronto's Scarborough campus and to the Malvern community, and then westward to the Sheppard Subway extension, should be a priority. However, a 401RT through Scarborough provides much better and faster access between the northern half of Scarborough and the rest of Toronto. It may be worthwhile to extend the LRT to Kingston Road (roughly $1.7 billion), but not further.
3. The 401RT and the Eglinton LRT would divert some ridership from a proposed $2.6 billion Jane Street LRT. For example, a trip from Jane at Wilson Avenue to downtown Mississauga currently takes 78 minutes; a Jane LRT wouldn't make the trip much faster. Using the 401RT, the trip would take just 33 minutes. Overall average trip lengths on Jane buses would shorten, decreasing crowding on Jane buses.
4. The planned $1.2 billion extension of the Eglinton West LRT from Renforth Drive to Pearson would not be needed. Travelers to Pearson would transfer from the Eglinton LRT to the 401RT at a junction station east of Renforth Drive.
5. The 401RT would divert ridership from a proposed $1.0 billion Finch West LRT extension to Pearson. Ridership on the LRT extension will not be enough to justify it. Overall, the Finch West LRT is too remote from the core of travel demand in Toronto to be much more than a transit service for local populations.

For a 69-kilometre 401RT Express train across the underserved northern half of Toronto and into Pickering and Mississauga, and 225 million new transit trips per year by 2051, a net $13 billion cost above current plans for rapid transit is a huge bargain, even before potential federal funding participation, which can reach 40%.

And there's more to be happy about. Cost sharing by non-residential taxpayers and the federal government (assuming 40%), population growth, deficit funding and assuming a borrowing rate for the Ontario government of 3%, the average daily cost per household to build the 401RT and NW401RT works out to about 11 cents per day (see figures at right).

And what's the comparison? The average cost per year to own and operate a new gasoline-powered car in Ontario can be, variably, $15,000 per year. That's $41 per day.

So, in a way, switching from driving a car to using public transit can be a household budget bonanza.

All of a sudden, it's a no-brainer.

Cost to Build the 401RT Express and NW401RT Express

(Costs in millions of dollars)

25,800	Gross Cost – 401RT Express
7,300	Gross Cost – NW401RT Express
33,100	Net additional cost
13,200	Canada Share @ 40%
19,900	Net Ontario cost
3%	Interest rate (N.B. 2023 was 3.2%)
597	million$$ per year
46.0%	Household share (per Ontario Budget)
274.62	Household share - millions$
18,000,000	Ontario population 2031
2.6	Avg. hshld size
6,923,000	Ontario Households in 2031
$ 39.67	Cost per avg. hshld per year
$ 0.11	per day (excluding household tax share of Gov't of Canada cost)

N.B. Figures exclude expenditure offsets

file: 401RT Costs & Riders ELEVATED SIMPLE

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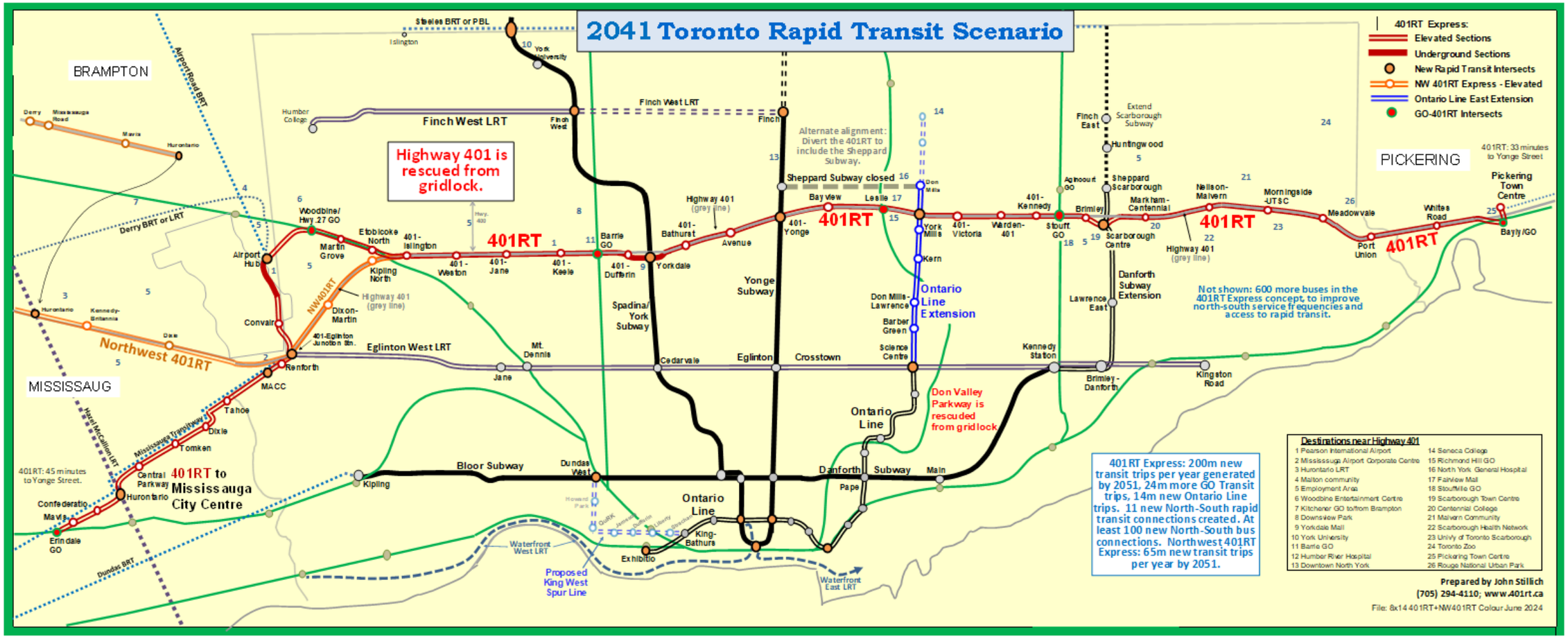
2041 Toronto Rapid Transit Scenario
401RT Express:
Elevated Sections
Underground Sections
New Rapid Transit Intersects
NW 401RT Express - Elevated
Ontario Line East Extension
GO-401RT Intersects
BRAMPTON
MISSISSAUGA
PICKERING
Steeles BRT or PBL
Finch West LRT
Highway 401 is rescued from gridlock.
401RT
Northwest 401RT
NW401RT
Eglinton West LRT
Derry BRT or LRT
Airport Road BRT
Dundas BRT
Hurontario LRT
Mississauga Transitway
401RT to Mississauga City Centre
401RT: 45 minutes to Yonge Street.
401RT: 33 minutes to Yonge Street
Alternate alignment: Divert the 401RT to include the Sheppard Subway.
Sheppard Subway closed
Yonge Subway
Spadina/ York Subway
Bloor Subway
Ontario Line
Ontario Line Extension
Don Valley Parkway is rescued from gridlock
Danforth Subway Extension
Extend Scarborough Subway
Proposed King West Spur Line
Waterfront West LRT
Waterfront East LRT
Not shown: 600 more buses in the 401RT Express concept, to improve north-south service frequencies and access to rapid transit.
401RT Express: 200m new transit trips per year generated by 2051, 24m more GO Transit trips, 14m new Ontario Line trips. 11 new North-South rapid transit connections created. At least 100 new North-South bus connections. Northwest 401RT Express: 65m new transit trips per year by 2051.
Destinations near Highway 401
1 Pearson International Airport
2 Mississauga 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 Centre
20 Centennial College
21 Malvern Community
22 Scarborough Health Network
23 Univ of Toronto Scarborough
24 Toronto Zoo
25 Pickering Town Centre
26 Rouge National Urban Park
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