Hunting for Long-Term Real Estate Bargains:

Autonomous Cars, Semi-Autonomous Cars, and Toronto's Railways to Nowhere

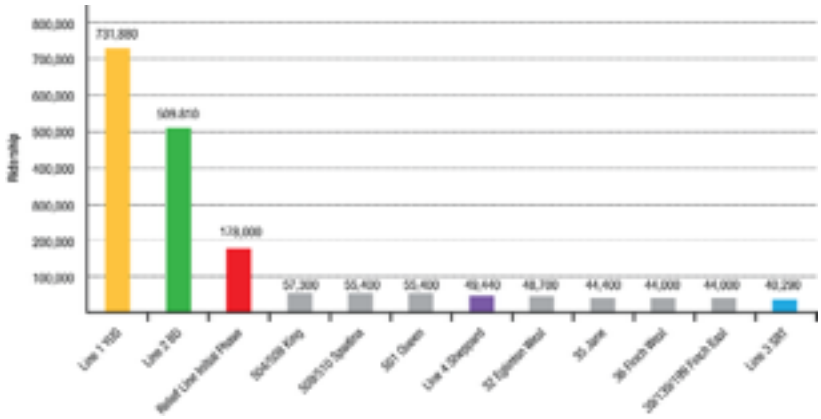
The City of Toronto has two "railways to nowhere": the Sheppard subway and the Richmond Hill GO train.

The Sheppard Subway

The Sheppard subway is 5.5 km long, has five stations, and connects to only one other rail line, the Yonge line. By comparison, the Yonge-University subway will soon be 38.8 km long (when the Vaughn extension begins operation), will have 38 stations, and will connect to many other rail lines, including the Bloor-Danforth subway, the Sheppard subway, 7 GO train lines (all at Union), and eventually also the Eglinton Crosstown. The Bloor-Danforth subway is 26.2 km long, has 31 stations, and has connections with other rail lines at stations like Dundas West (the Union-Pearson Express train and the Kitchener GO train), Main Street (the Stoufville GO train and Lakeshore East GO train) and Kennedy (the Scarborough RT*, Stoufville GO train, Eglinton, and, if the City's current transit plans are realized, the Scarborough subway tunnel).

* The Scarborough RT is 6.4 km long and has six stations. According to current plans, it will be replaced with a 6 km, one-stop subway

TTC, Approximate Ridership By Line



This shows the high ridership of the YUS (Yonge-University-Spadina) and BD (Bloor-Danforth) subways; the low riderships of the Sheppard subway and Scarborough RT (so low that they fall behind some streetcar and bus routes); and a projection of the ridership for a future "Downtown Relief Line" subway
Source: TTC Operating Statistics (2012-2013) and MADITUC Model * Relief Line Initial Phase *based on 2031 ridership forecast.

The Richmond Hill GO Train

Before the start of this year, the Richmond Hill GO train line was 34 km long and had five stations, three of which were located within the City of Toronto. With an extension to a new station, Gormley Station, having been opened in 2017, the line is now 42 km long, with six stations—but still only three in the City of Toronto. In contrast, the other six GO lines are between 50-103 km long (for an average of 69.6), have between 9-13 stations (for an average of 11.2), and have between 2-6 stations within Toronto (an average of 4).

GO Transit Rail Weekday Ridership (2016)[50]			
Corridor	Riders	%	
Lakeshore West	65,167	30.6%	
Lakeshore East	51,260	24.1%	
Milton	28,628	13.5%	
Kitchener	22,436	10.6%	
Barrie	18,859	8.9%	
Stouffville	15,876	7.5%	
Richmond Hill	10,293	4.8%	
Total - GO Rail System			***212,519***

Source: Metrolinx RER Report

The main reason for the Richmond Hill line's low usage is that it runs along the floor of the Don Valley for much of its length. This has two effects. First, it means that the line does not follow a direct route on its way to and from Union, but instead curves along with the path of the valle. Thus, from Union to the nearest station, Oriole, the line runs 19.6 km, even though, as the crow flies, the distance between those stations is just 13.4 km. The culprit here is a sharp bend that the line takes, following the Don, north of St. Clair. It later takes a few other, smaller bends. The line in its entirety is 42 km, but 33 km as the crow flies.

Second, because the line runs along the valley floor for nearly all of its length within the City of Toronto, it means that it is difficult to build any new station between Oriole Station—which is next to the 401—and Union. A valley station would not be easily accessible from areas of the city around it. For example, an obvious place for a new station would be where the Richmond Hill line meets the Danforth, so that people could connect to or from the Bloor-Danforth subway. However, since the nearest subway station, Castle Frank, would be located 400 metres away from, and also 35 metres *above,* where any such station would be located, building it has not been worthwhile. (It has also not been worthwhile because Castle Frank is itself isolated by the Don and Rosedale valleys, which limit its ability to access bus and streetcar routes).

When combined with the aforementioned winding route the Richmond Hill line takes, this has resulted in low ridership levels and no stations being placed between Union and Oriole. Indeed, whereas Oriole is 19.6 km from Union, the other lines have stations between 3-20 (for an average of 10.3) km from Union. This lack of stations in either downtown or mid-town Toronto is a main reason why the line is not used much.

The Richmond Hill line is also being left out of plans to significantly expand the GO system in the next several years. The biggest of these, which Metrolinx claims will be ready by 2023, is for the Lakeshore West line. This extension which will add more than 60 km and four new stations to the line, to reach from Hamilton (its current terminus) to St Catharines and Niagara Falls. On the Lakeshore East line, a 20 km, four-station extension from Oshawa to Bowmanville is being planned. Premier Wynne even recently announced a desire to build a Toronto-Windsor high speed train, with two of the stops intended to be near GO/Via Rail stations on the Kitchener line. For the Richmond Hill GO line, though, there are only plans for four more km and one new station. This will extend the line to the border of Whitchurch and Aurora.

Nor will the Richmond Hill line partake in Mayor Tory's transit project, SmartTrack. Assuming that it is actually implemented, SmartTrack is expected to bring several new train stations to Toronto in the next decade. Some of these might be exclusive to GO, some exclusive to SmartTrack, and some serving as both GO and SmartTrack stations. Yet none of these new stations is likely to be on the Richmond Hill line.

Expected future GO train and SmartTrack stations; source: Toronto Star, June 2016

Rail Connections

As if these two 'railways to nowhere' weren't limited enough, they also fail to intersect with one another —yet come *so close* to doing so. The Sheppard subway's Leslie Station is just 700 metres from the Oriole GO train station. But 700 metres is simply too far for most commuters to want to walk, especially when the weather is too hot, too cold, or raining. By comparison, the Spadina Station tunnel (which, unlike the Leslie-Oriole connection, is sheltered underground) is only 150 metres. And even Spadina's tunnel pisses people off. The Leslie-Oriole connection also passes beneath the 401, which is noisy and can be creepy at night.

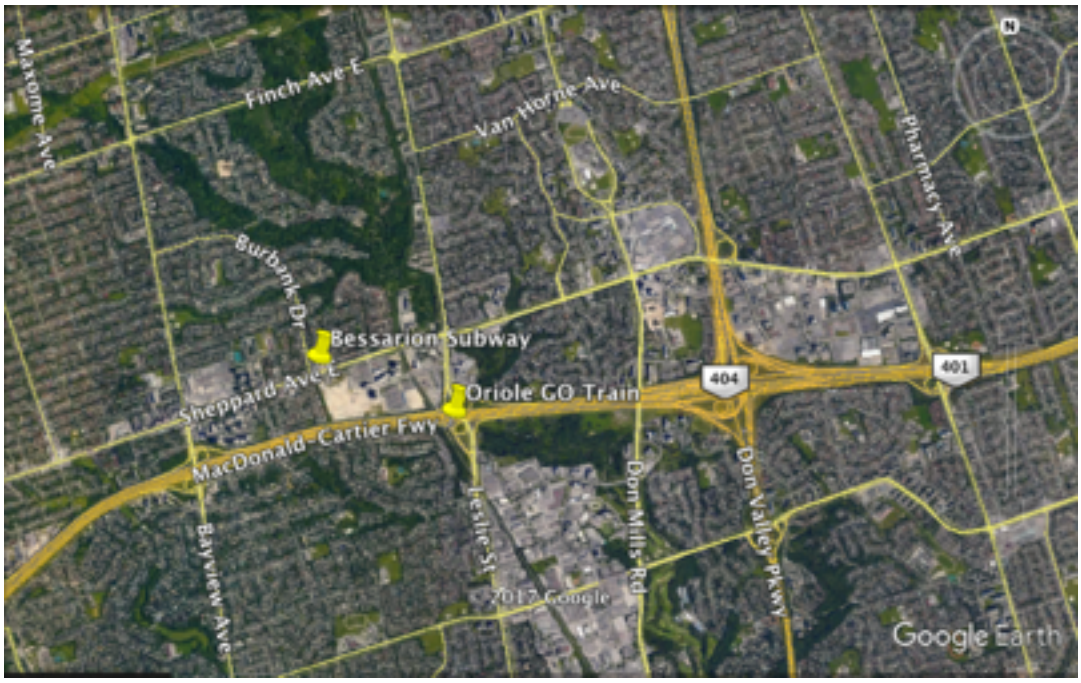
There have been plans to rebuild Oriole Station further north, next to Leslie Station. But because both train lines are lousy anyway, these plans haven't been viewed as enough of a priority to follow through on them.

As such, there is only one connecting station on Sheppard (at Yonge), and one on the Richmond Hill line (Union).

Bessarion Station

On the University-Yonge and Bloor-Danforth subways, only around 15 percent of stations are relatively useless (think Chester, Glencairn, Castle Frank, Rosedale, Summerhill, Old Mill, etc.). On the Sheppard line, however, which has just 5 stations, 60 percent are relatively useless: Bayview, Leslie, and Bessarion. Each of these three are among the least used stations in the city. Only Sheppard-Yonge and Don Mills are busy.

Still, it is Bessarion's ghost-like quality that really stands out. It is by far the least used of Toronto's 64 subway stations. In 2013, Bessarion had 2,080 passengers per week get on or off the subway at it. By comparison, the most used station in the system, Yonge-and-Bloor, had approximately 2.8 *million* users per week.



Bessarion's emptiness is due to the Don Valley to its northeast and the 401 to its south, which isolate it.

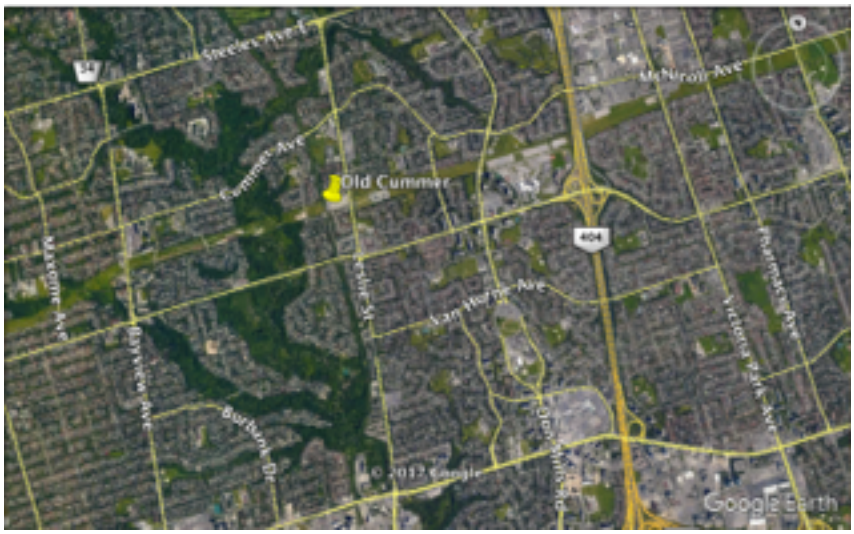
Oriole Station

The Oriole GO train station is also relatively inaccessible. This is due to its location just west of the Don Valley, in the armpit of the 401. By car, the station can be reached only from the north, via an underpass beneath the highway. By foot Oriole is reachable only by this same underpass, or else by a 40 metre foot-bridge, which links the station to the residential neighbourhood west of Leslie and south of the 401. The footbridge is accessible via an 80 metre path, and by walking up and then back down a fairly tall staircase. If residents do not want to use this bridge, they must drive a 1.7 km detour around it. Even then, Oriole's cramped location means it only has around 295 parking spots. This is not very many, even for a station in Toronto.

Oriole Station, as seen from Highway 401

Old Cummer

Yes, this really is a station's name. Old Cummer is the only station on the Richmond Hill line that is in the City of Toronto, apart from Union or Oriole. While better than Oriole, it too is not so easy to access. It is surrounded by the Don Valley to both its west and north. It is 400 metres north of Finch, at the Hydro corridor.



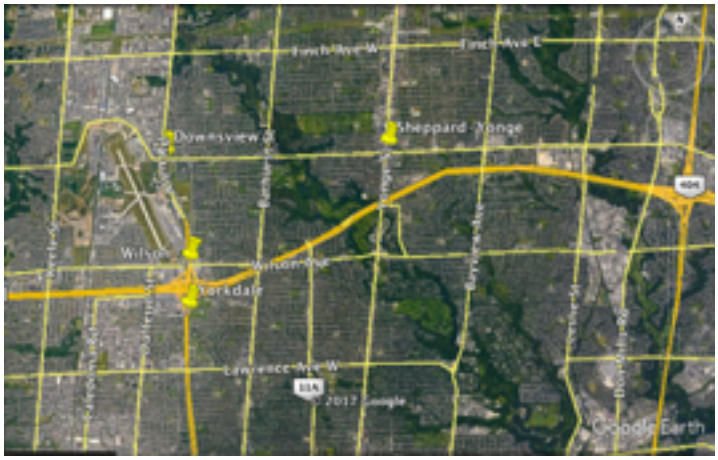
Challenges and Solutions

This area of the city, then, has three challenges. **First,** it is not so easy to access Oriole or Old Cummer stations, or Sheppard's stations. **Second,** there is no good Oriole-Leslie interchange. **Third**, both railways suck.

Our question, then, is: firstly, what kind of impact could autonomous cars have on these challenges? And secondly, if autonomous cars do not become widespread as soon as some people expect them to, what impact might *semi*-autonomous cars have? (We will define semi-autonomous cars as cars that could be used autonomously only at certain limited times, and/or in certain limited areas, and/or at certain limited speeds).

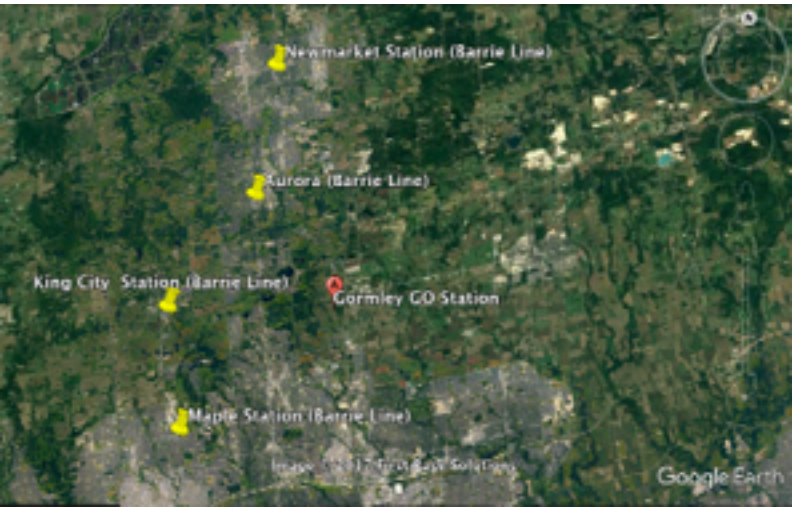
Autonomous Cars

It seems to me that, *if* autonomous cars really do become common, they will go a very long way towards overcoming these challenges. They would, in effect, allow the Sheppard Subway and Richmond Hill GO line to no longer become railways to nowhere. Rather, they would become railways to robots. People would have the option of using autonomous vehicles to get to or from stations that are today difficult to reach. They could, for example, use autonomous vehicles to travel comfortably between Sheppard-Yonge Station and the Allen's subways—either to get to Sheppard West, or to get to Yorkdale or Wilson via the 401.



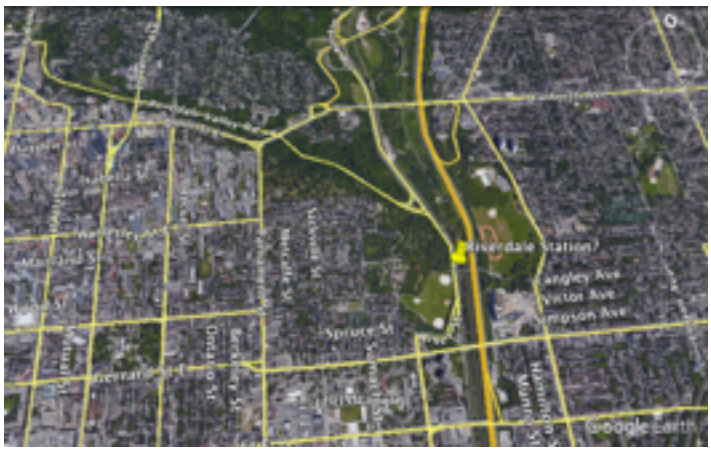
Autonomous vehicles could, similarly, be used to travel between Leslie Station and the Oriole GO train Station. Or between Bayview Station and the Bayview Extension express road. Or between Don Mills Station and the 401 or DVP/404 highways. Or between Bessarion Station and…well, alright, you can't win 'em all.

Autonomous vehicles might also allow passengers to move easily between one GO line and another. If, for example, somebody wanted to get from the city of Barrie to Sheppard Avenue in Toronto, they *might* find it useful to take the Barrie GO train to Aurora Station, then ride an autonomous car for 7-10 km to transfer to the Richmond Hill line at a station like Gormley or (once it is done being built, likely in 2020) Bloomington. Autonomous vehicles could also take people to and from the Richmond Hill line to nearby highways; the whole line runs alongside the 404/DVP, and Oriole and Langstaff are also near the 407/7 or 401.



This map is a little out of date: it does not show Gormley Station, which opened only at the start of 2017. But it is still much better than GO's official station map (see image below), which has relatively little relation to reality

More importantly, but also much less certainly, autonomous vehicles might finally make it possible to add a station or two to the Richmond Hill line *within* the City of Toronto, between Oriole and Union. Such additions have not been viable thus far; they would have to be put inside the Don Valley, and therefore would have little or no parking capacity and little or no accessibility to bus, streetcar, or subway routes in nearby areas of the city. With autonomous vehicles, though, such challenges may no longer be prohibitive ones. If, say, a platform were to be added to the line next to the Riverdale Pedestrian Bridge, it might be accessible, via autonomous vehicles, from the Danforth, Bayview, Gerrard, Broadview and Rosedale Valley Road.



Other possible locations for the Richmond Hill GO line, which would barely even be thinkable without autonomous vehicles, but might become viable *with* autonomous vehicles, would be next to the Bayview Extension beneath the Danforth; *or,* next to Bayview, the DVP, and the parking lot of the Evergreen BrickWorks; *or* beneath Eglinton, between the Eglinton Crosstown's future stations at Wynford and Sloane. Still, these stations would not come cheap. A Danforth platform, for example, might need a 400 metre tunnel, or at least a ramp or elevator, to connect autonomous vehicles or pedestrians with Castle Frank. There are also flooding concerns: the Richmond Hill line has sometimes had to close after heavy rains.

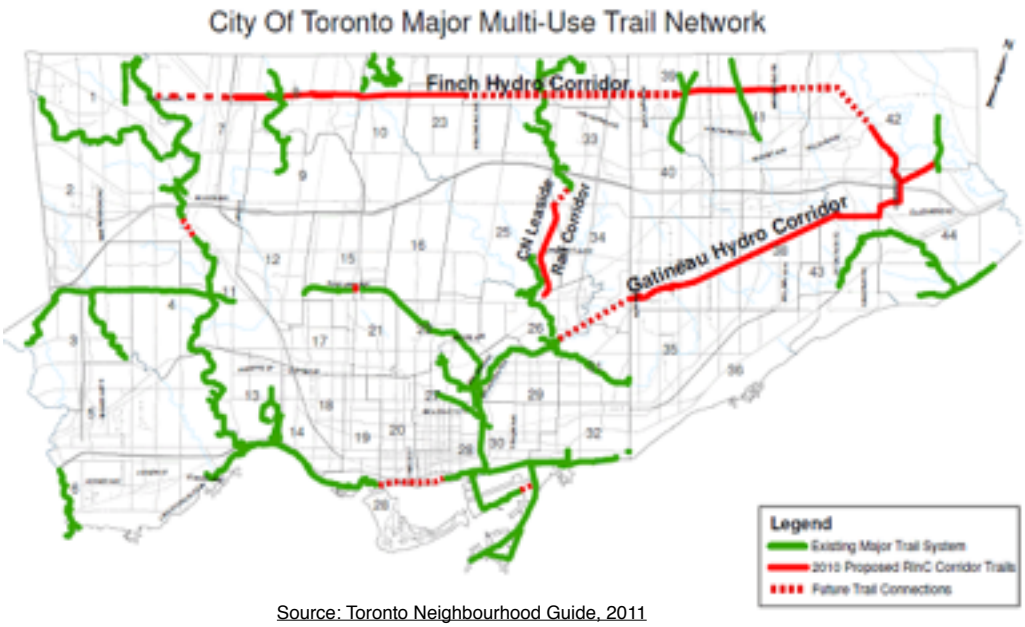
There is another reason why adding another station or two to the Richmond Hill line could be viable in spite of these costs. It could also help to facilitate autonomous busses or autonomous ridesharing *within* the valley. If, for example, a link was put in place from the valley floor up to Danforth or Eglinton, it could also be used to allow people to get on or off a bus or carpool (or 'Uberpool') running on Bayview or the DVP.

Busways and Bikeways

The Richmond Hill line and Sheppard Subway are characterized by their relationship to the Don's ravine system. Oriole, Old Cummer, and Langstaff are located next to one of its valleys, as are Sheppard-Yonge, Leslie, and Bessarion. If stations are ever added near the Danforth or Eglinton, they would be *within* the ravine. Indeed, a Riverdale stop would be located at the convergence point of the Don's entire tributary system.

Ravine trails share two important qualities with railways. You can't take your car on them, and you can't get on or off of them whereever you wish. Rather, ravines have "stations" just like railways do: staircases, paths, or roads where one can enter or exit them. As with railways, ravine "stations" are not always well-placed.

Autonomous vehicles may have two significant effects upon these ravine trails. First, autonomous vehicles could make it easier to get to or from ravine entrances that are otherwise bothersome to reach. Second, very small autonomous vehicles — autonomous bicycles, for example — might become usable on ravine trails themselves. These might be especially useful in winter, when the ravines can otherwise be harder to use.



Source: Toronto Neighbourhood Guide, 2011

A similar thing could be true of Toronto's hydro corridors, notably the Finch and Gatineau Corridors. Both are already contain cycling paths today, and both could be important to the Richmond Hill GO line: Finch because Old Cummer Station is located at the Hydro Corridor, immediately east of the Don Valley; Gatineau because it meets Eglinton very close to where the Don Valley Parkway and Richmond Hill line do.

The York University Busway, a 2 km line opened in 2009, from Dufferin to Keele on the Finch Hydro Corridor

The reason that longer busways along the Finch or Gatineau corridors have not been built is that they, too, would in effect be transit "to nowhere". The Finch hydro corridor is generally about 400-900 metres north of Finch itself, which means that the corridor never really comes close to any major intersections where it could be useful to have bus stops. Ditto for the Gatineau corridor, with the odd exception. Thus it has not been worthwhile to build such busways. With autonomous cars, however, people could get off a bus and, rather than be stuck at a bus stop half a km north of Finch, instead transfer to an autonomous car. These busways might then become worthwhile. Especially if the busses themselves become driverless too.

Busways and Highways

In the last few years, Mississauga has built the longest busway in the GTA by far: the 18-km, 12-station Mississauga Transitway, which runs directly alongside the 403 Highway for most of its length. This raises a question: why don't more transitways use highways' right-of-way corridors? If there were, they could be significant for both the Sheppard subway and Richmond Hill rail line. All of Sheppard's stations are within 200-600 metres of Toronto's superhighway, the 401. One, Don Mills Station, is also just 450 metres from the 404/DVP. Most of the Richmond Hill line's stations are near the 404 too. Oriole Station, meanwhile, is next to the 401, while Langstaff Station is located at the only part of the city where the 407 and Highway 7 converge.

Metrolinx does, in fact, have plans for a Highway 407 Transitway, but it might not be ready until the 2030s. The challenge of adding busways to highways is similar to that of adding busways to hydro corridors (or that of utilizing railways with few stations in urban areas, such as the Richmond Hill line): having it be easy to get to or from its bus stops. This accessibility is limited by two factors. One is the fact that highways tend to run through relatively sparsely populated areas. The other is the fact that, if you put the busway on one side of the highway, you will not be able to get to it from the other side of the highway without a bridge.

The City of Toronto already does have one significant transitway which uses a highway's right-of-way: the Allan Expressway's surface subway. It consists of four stations: Yorkdale, Wilson, Lawrence, and Glencairn. Only one of these stations, Yorkdale, is really a success. Another, Glencairn, is a failure: it is the least used station *by far* on the western half of the Yonge-University subway line. In any event, it is easy to see why this transitway in the middle of the Allan is a lot more viable than a transitway on, say, the 401 would be. The Allan is about 1.4 times less wide than the 401, and runs in a shallow trench. Thus, it is a lot simpler to build stations and bridges at places like Glencairn, Lawrence, or Yorkdale (a pedestrian bridge, in the case of Yorkdale) than to locate a transitway directly adjacent to, or in the middle of, the 100 metre wide 401.

Glencarin Station

Yorkdale Station

I think you can probably spot where I'm going with this. Autonomous vehicles! They might (again, as with hydro corridors) make highways' transitways more viable. Not only by allowing the busses themselves to become driverless, but also by allowing passengers to get to or from the bus stops easily using driverless cars.

Another reason autonomous cars could make highway-transitways more viable is by making bridges over highways more viable. Today, building a new bridge over a highway like the 401 would be prohibitively expensive. Whereas over the Allan building bridges was fairly easy, both because of its narrowness and because of the trench it runs through, the 401 is a lot wider than the Allan and is not within a trench; long access ramps would be required on either side of the highway for any new bridge over it to be high enough for trucks to pass undernneath. Much cheaper would be pedestrian bridges, in part because they do not require access ramps. But you can't take your car with you on a pedestrian bridge, so what's their use?

There is not much use—unless you have autonomous cars. With autonomous cars, you might be able to drop off a car at one end of the bridge and then get in another one upon reaching its opposite side. Of course, this does not mean that pedestrian bridges over highways are going to start popping up all over the place. But (as with the pedestrian bridge at Yorkdale) they could help highway transitways to become viable.

There is another related challenge with today's highways and highway transitways: parking. As you can see in the picture above, the area in Toronto surrounding the intersection of the 401 and Allan Expressway — an area that, in theory at least, should have a decent amount of urban development, given its access to both Yorkdale subway station and Wilson subway station — is mostly wasted. Instead of being filled with buildings or parks, it is filled with large parking lots, and with an even larger "archipelago" of unused land that is trapped within the intersection's many access ramps. And this is not even the biggest of Toronto's highway archipelagos. At the intersection of the 401 and 404/DVP, the "archipelago" is so big that it could contain two Skydomes within it, with room leftover to spare. It is nearly 800 metres across at its longest point; by comparison, the archipelago at the Allan and 401 (see above) is 480 metres across at its longest point.

In my opinion, the picture of the Allan and 401 intersection raises a question: why not build parking lots *within* the highway archipelago, in order to free up some existing parking lot land to be used for urban development? Obviously, this is a rediculous idea. It would not work, because it would be highly difficult for either pedestrians or cars to get (for example) from an archipelago parking lot to Yorkdale and back again.

But what about with autonomous cars? Here too, I think, autonomous cars could make an idea that is absurd today become viable tomorrow. Autonomous cars could allow for archipelago parking, for two reasons:

1) autonomous vehicles could drop off and pick up passengers, like a valet. Using Yorkdale as an example again, the autonomous vehicle could drop off a passenger at the door of the mall, then drive itself to the archipelago parking lot, and then come back to the mall to pick up the passenger when he or she is going home

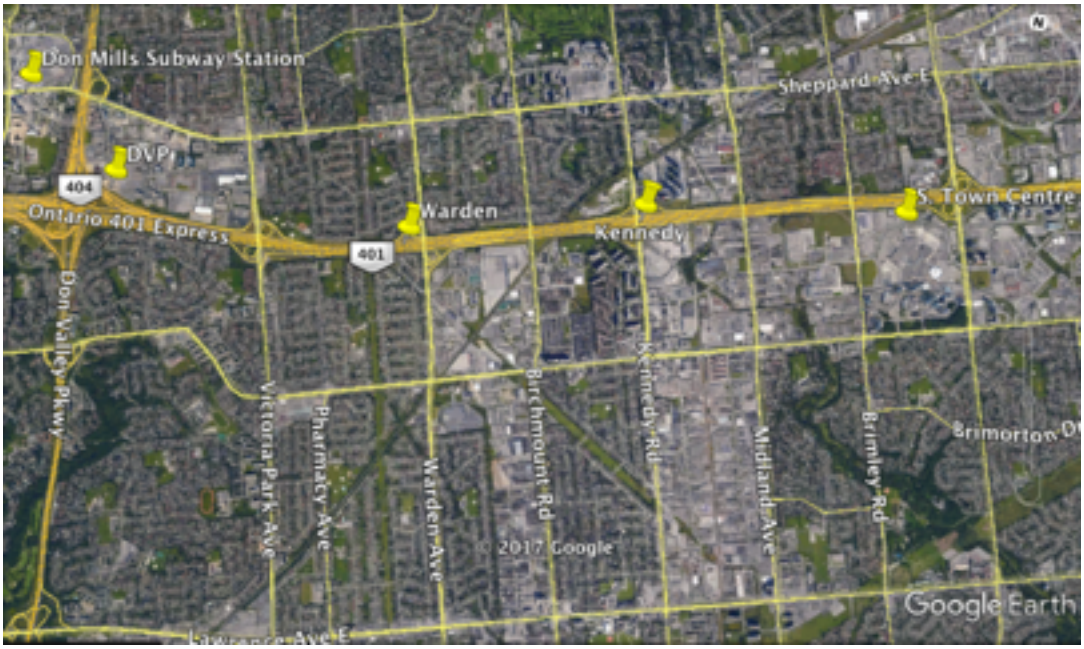
2) autonomous vehicles can allow for multi-story parking lots, whether underground or above ground. Today, the vast majority of parking spots in Toronto are at surface level. Even where there are multi-story lots, they tend to be no more than three or four stories in height. The reason there are not parking lots with, say, 20 stories, is because drivers do not want to have to go up or down long, winding ramps for 20 floors (or wait in long lines for car-elevators), and also ride elevators for 20 floors, to get into and out of such parking lots. But with autonomous cars, no such problems exist. (Plus, the stories themselves could each be shorter, as autonomous lots would not have to worry about tall humans banging their heads on the ceilings). Parking lots with many stories—either high-rises or underground, or both—would probably become useful in certain locations. At train stations, for instance. Or in highway archipelagos next to train stations.

Assuming this highway-archipelago-multi-story-parking-lot fantasy really does come true, such lots could be very useful for train stations that are next to highway arichipelagos, and especially for ones that have relatively little parking today. (Oriole, in other words). They could also be extremely useful for highways' transitways. Given, for example that there are archipelagos at every intersection between highways and main streets, they could be ideal places to put busway stops next to. A passenger might, for instance, be able to take an autonomous car from their home to a highway's busway, get out of their car and onto the bus, and then get into another car—a car coming from an adjacent, multi-story archipelago lot—at one of the busway's stops. In this way, a vast amount of land that would otherwise be unuseable (archipelagos) may be used for transit. This could be true not just of busses, but also of other transitways, like the Allan's subway.

The South Red Line train, in Chicago

The Mississauga Transitway

Indeed, autonomous cars *might* even make another idea that has never been viable before to become so: extending the Sheppard subway 7.2 km east to Scarborough Town Centre, but at surface level on the 401 (see image below). This would create new train stations that, without autonomous cars, would be hard to reach: at the DVP/404 (next to the massive archipelago), at Warden (next to two hydro corridors), and at Kennedy. Only one km of this extension would be underground: from Don Mills Station southeast to the 401.



Semi-Autonomous Cars

It may be that, before the widespread arrival of autonomous vehicles, there will at first be only *semi*-autonomous ones: vehicles that can function autonomously only in certain places, or at certain times or speeds.

Whereas autonomous vehicles are likely to revolutionize transportation in general (for better or worse), semi-autonomous vehicles may be likelier to revolutionize just two aspects of transportation: parking and transferring.

There are, in fact, already very basic semi-autonomous cars available: cars which parallel park themselves. These are helpful, no doubt, but hardly revolutionary. More impactful would be if autonomous parking lots become a reality. As we discussed in the section above, autonomous parking lots could be extremely useful for rail lines like the Sheppard subway or Richmond Hill GO line. Imagine, for example, someone who wants to get from Sheppard-and-Don Mills to Queen-and-Dufferin. They might then drive a semi-autonomous car from their home to Oriole Station, get on the train while their car parks itself in an autonomous parking lot, take the train to Union, grab another car from a multi-story autonomous lot next to Union, and then drive that car on to Queen-and-Dufferin, parking it in yet another autonomous lot.

In other words, the existence of (semi-)autonomous parking lots would create a sort of invisible linkage between places that have them—even if the cars only function autonomously when they are *within* the parking lots. If, to give another example, autonomous lots were built at Yonge-Sheppard Station and at Downsview Station (or at Yorkdale or Wilson), it would create a sort of linkage between the Sheppard/Yonge subway lines and the University line. If they were built at Leslie Station and Oriole, it would create a linkage between the Sheppard subway and the Richmond Hill GO line. For railways with few good links today—again, like Sheppard or Richmond Hill—such linkages created by semi-autonomous cars would be useful.

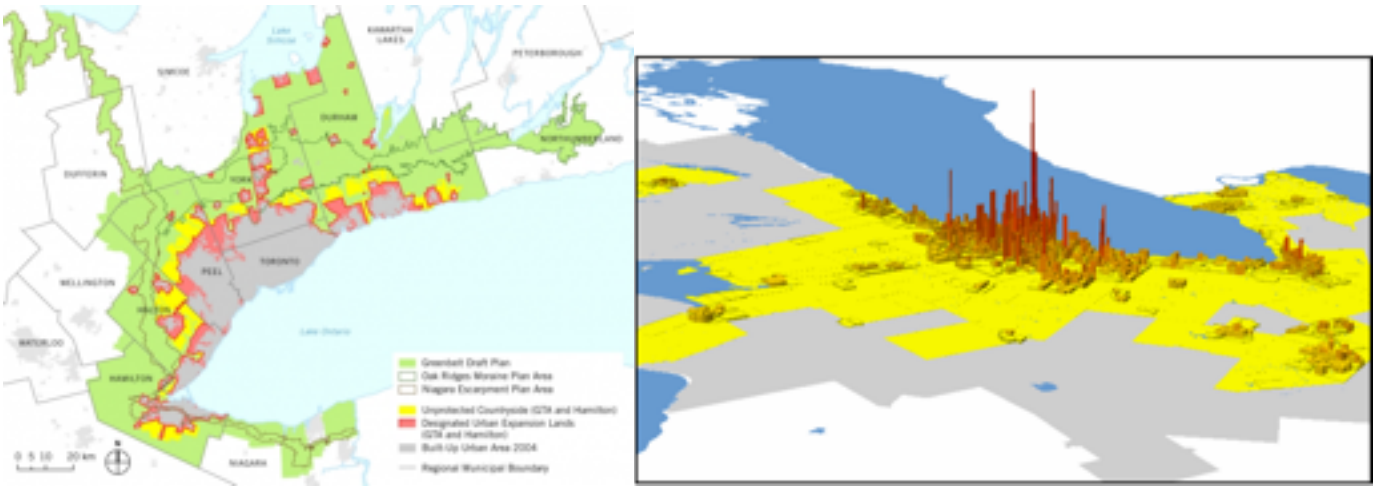
Much more impactful, though, would be road lanes designated for autonomous cars. Obvious places to put such lanes would be between train stations of different rail lines. The 700 metres between Oriole and Leslie would be a sensible place for an autonomous lane, for example. Or the 500 metres between Langstaff and the Richmond Hill Centre transit station. Or even a 5 km lane between Sheppard-Yonge Station and Downsview. Or an autonomous bus lane on a hydro corridor like Finch or transitway like the 407's.

The Sheppard subway and Richmond Hill rail line would also benefit if cars were only allowed to operate autonomously at certain limited times of day. Imagine, for exampe, that Toronto fears the introduction of autonomous vehicles, and so allows them at first to operate autonomous only very late at night — say, from 4 am to 5 am, when the streets are otherwise empty — and only at very slow speeds in residential areas. Having a "witching hour" of this kind would be amazing for car-sharing services (like Car2Go, for example), as it would allow them to deliver cars autonomously to people's homes for use the following morning. Easier car-sharing, in turn, would lead to easier parking and transferring. Commuters might, for example, drive one car-sharing car from their home to Oriole, then get in another car-sharing vehicle at Union.

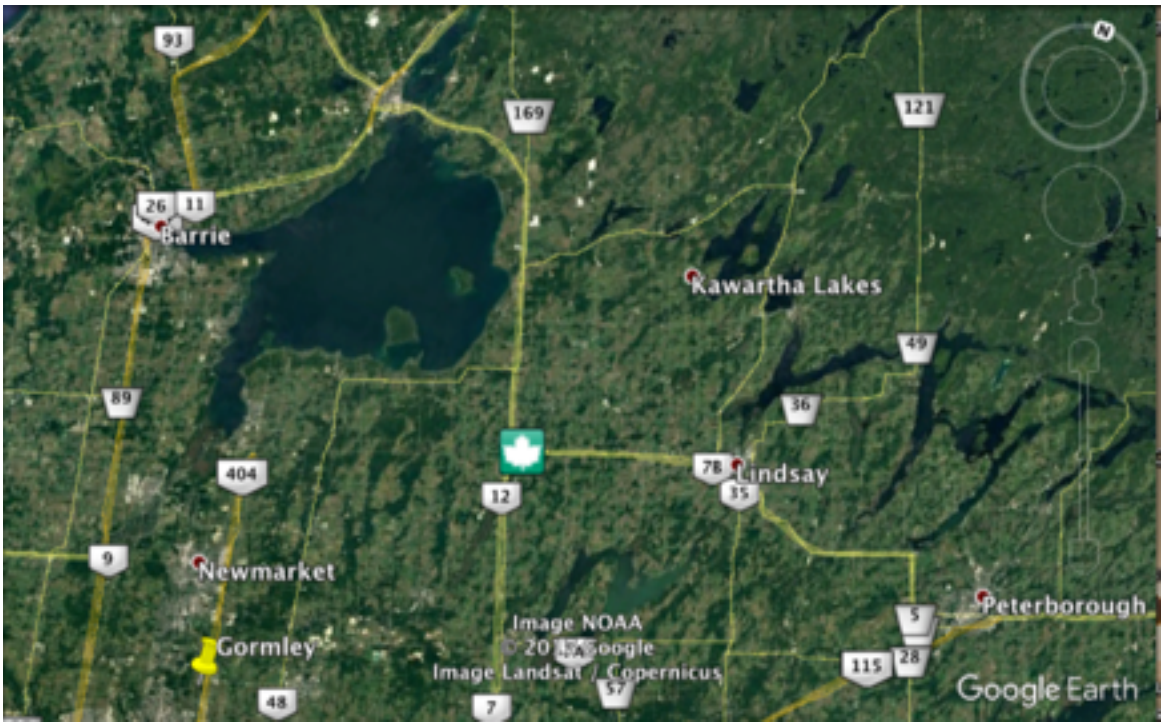
So, whether autonomous vehicles are at first limited only to certain designated parking lots, or to certain designated lanes, or to certain designated times, they would still be likely to benefit Toronto's "railways to nowhere".

Lake Simcoe

Before we start looking at specific real estate in Toronto, let's take one last detour, and discuss the fact that the Richmond Hill line *doesn't really go anywhere*. Unlike the Lakeshore West, East, Kitchener, Barrie, or Milton lines, the Richmond Hill line doesn't reach any notable places outside the GTA. Even if it were to be extended further north, it would still only reach Georgina, a sparely populated area next to Lake Simcoe.



This map is "upside-down"; that's Barrie on the left-hand side



If the south shore of Lake Simcoe were to become more highly populated or more often visited, the Richmond Hill line would become more useful. Though most of the south shore of Simcoe is part of the Green Belt, there are exceptions to the Belt where urban growth is allowed: in places like Keswick and Jackson's Point.

One problem that these areas have in growing their populations, however, is that they are blocked-in both to the north and the west. On the north they are blocked by Lake Simcoe itself; to the west they are blocked by Cook's Bay (and to a lesser extent, Kempenfelt Bay) and by the Holland Marshes, which extend south from Lake Simcoe. (Highway 11 passes through the Marshes, but you have to drive an extra detour south of the Bay to get to it, and then back north again if you are trying to get from there to Barrie).

Moreover, much of the area to the north of Richmond Hill is part of the Great Lakes Snow Belt. Barrie, for instance, gets nearly twice as much snow every year as Toronto does. Even Newmarket gets close to 20 percent more snowfall on average per year than Toronto proper does. Driving in a squall on Highway 12 can be a very uncomfortable—even terrifying—especially after sunset, which comes early during the winter.

Autonomous vehicles could have several effects on this area. One, could make it easier for people on Simcoe's south shore to get south to the Richmond Hill line. Two, it could make populations on the south shore bigger, by increasing the area's ability to cross Cook's Bay (via boat, then via autonomous car upon reaching the opposite shore of the Bay) to reach the local "big city", Barrie. And third, it could make it easier to live in or travel to the area in winter, by making it easier and safer to drive in a snow squall. People might then be more drawn to the area for the positive aspects of its snowfall—recreation and beauty.

Conclusion: The Crow's Advantage

In the all-too-plausible event of fuel prices rising very high, like they did briefly in 2008 and for a longer period during the 1970s, the importance of living near to transit stations would increase. So too would the importance of living next to potential shortcuts to reach transit stations; especially if, as we have discussed, many potential shortcuts might become viable as a result of autonomous or semi-autonomous vehicles.

This potential shortcut factor is what we are calling the "crow's advantage": the distance to the nearest transit station by car, versus the distance to the nearest transit station *as the crow flies*. Given that semi- and full autonomous vehicles might also make Toronto's "railways to nowhere" more useful than ever before, what we will now look for specifically are properties that have a high "crow's advantage" with regard to nearby train stations on either or both the Richmond Hill GO line and the Sheppard subway line.

Take, for example, the part of Woodsworth Road that is directly across the 401 highway from the Ikea's parking lot. As the crow flies it is 400 metres from Oriole GO Station (accessible via pedestrian bridge), 700 metres from Leslie Station, 700 metres from Bessarion Station, and 1400 metres away from Bayview Station. By car, however, it is 2400 metres from Oriole Station, 2800 metres from Leslie Station, 3400 metres from Bessarion, and 2400 from Bayview. It's also 650 from North York Hospital by crow, but 2400 by car.

Another nearby example would be Manorpark Crescent, located by the confluence of the Don Valley and the 401 highway—which are Toronto's main natural and man-made barriers, respectively—across from Oriole and Leslie stations. Other examples might include Alamosa Dr or Forest Grove Dr, just north of Sheppard.

Woodsworth, Manorpark, Forest Grove, Alamosa

Outside of the Sheppard Subway-Richmond Hill GO line area, other places where highways, valleys, large parks, underused rail lines, or hydro corridors more or less intersect might be worth looking at. These could include, for example, the Warden-401 area (where two hydro corridors, the 401, and the Midtown rail corridor nearly converge), Lawrence-Midland, areas around Thorncliffe Park, or parts of Swansea and Mimico.