

7 - Martin Grove Study

Final Report

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Executive Summary

Route 7 - Martin Grove is a York Region Transit (YRT) bus route running through Woodbridge and north Etobicoke between Al Palladini C.C. and Humber Polytechnic, with a weekday extension from Humber to Woodbine Centre. Presently on weekdays, the route runs every 28-39 minutes during peak hours and every 50-60 minutes off-peak. The section south of Humber Polytechnic is presently circuitous and could be improved. That section also has low ridership, with only three percent of passengers counted using this section. The entirety of the route within Toronto is presently run near or along TTC route 927, which may be an alternative for some trips.

The route experiences crowding near or beyond the limits mandated in the *Ontario Highway Traffic Act* (1 standee per 3 seats) and beyond those recommended in the guidelines from neighbouring transit agencies. By the latter recommendation, mid-day service should not be any lower than every 44 minutes in any chosen solution. YRT has a limited budget, so identifying and eliminating inefficiencies in routing is a high priority for service improvements as additional resources can be allocated where they are needed more.

A few alternative routings were examined. Option 1 would improve the routing south of Humber Polytechnic. Option 2 would remove the section south of Humber. Option 3 would additionally modify the route between Martin Grove & Finch and Humber: 3A and 3B would create a loop at the south end, with buses in one direction following Option 2 and in the other direction running along Highway 27 (3A) or Humber College Blvd. to John Garland Blvd. (3B). Option 3C would run along Highway 27 in both directions, while option 3D would run along Humber College Blvd. to John Garland Blvd. in both directions. Option 4 would terminate the route at Finch Avenue and Martin Grove Road with an on-street loop on those two roads and Albion Road. It would require a transfer to the Finch West LRT line for Humber Polytechnic trips and should not be implemented until that LRT line opens. Two other alternatives were quickly rejected.

With the alternatives found, they were evaluated on their monetary efficiency, impacts on passenger experience, and benefits to operators. Monetary efficiency focused on the number of passengers compared to the service level in an area. With only three percent of ridership and over ten percent of time spent by buses, the section south of Humber is not monetarily efficient. By comparison, the section between Humber and Finch & Martin Gove had a third of all riders in a similar amount of time. Thus, options 2 and 3 are more monetarily efficient than options 1 and 4.

Passenger experience focused on the perceived length of a trip based on the TTC's service standards, specifically the effect on the cumulative amount of perceived travel time on all passengers, which yielded the same result: Options 2 and 3 being preferred. Finally, the main benefit to operators looked at was the presence of bathroom facilities at the south end of each route. The ones at Humber were easiest to access, while the facilities are worst with Option 4.

After, Options 2 and 3 were compared. The loops in Options 3A and 3B would require long waits for passengers travelling in the other direction at Humber College Terminal. Significantly more alternative bus service was found travelling to the industrial areas northwest of Finch Avenue and Highway 27 than to Etobicoke General Hospital, making Option 3D the preferred option, with Option 3C being the more monetarily efficient alternative and Option 2 retaining the existing access to the industrial park. YRT will implement a modified Option 3C effective April 27, 2025 and a new study should commence in September 2025 or January 2026 to determine its effects on ridership.

1.0 Introduction

Route 7 - Martin Grove is a bus route run by York Region Transit (YRT) in western Vaughan (Woodbridge) and northern Etobicoke between Humber Polytechnic at its south and Al Palladini Community Centre at its north end [1]. On weekdays, the route extends further south to the Woodbine Centre shopping mall [1]. This report studies the route to determine whether the south end needs to be modified and/or cut, and whether service needs to be modified in any other way due to ridership demand as observed in early 2024 and particularly in January 2025.

2.0 Background and Context

2.1 Route and Surrounding Area

Route 7 - Martin Grove runs between Humber Polytechnic at its south and Al Palladini Community Centre at its north end via Martin Grove Road, Highway 27, and Rutherford Road [1]. It has a short diversion to Highway 27 between Morning Star Drive and Langstaff Road to serve a shopping centre. On weekdays, the route extends further south to the Woodbine Centre shopping mall via Humber College Blvd., Finch Avenue, Highway 27, and Queens Plate Drive [1].

Based on several visits to the area, the neighbourhoods route 7 serves are all suburban in nature, except near the Woodbine Centre shopping mall, where there are a few apartment buildings. Based on several visits, the mall appears to be in serious decline. The mall's anchor spaces are occupied by either Hudson's Bay or locations with permanent clearance sales and it was put into receivership in May 2023 [2]. The mall does not connect to route 7 or other transit well, requiring any transit user to walk across the vast parking lot to access any nearby bus route. The route then serves Humber College Bus Terminal, connecting to Brampton Transit, MiWay, and several area Toronto Transit Commission (TTC) bus routes. The terminal serves Humber Polytechnic's North Campus, which 19,000 students are enrolled at [3]. Etobicoke General Hospital lies across Highway 27, but is not directly served by route 7.

As the route travels north, it shares a short stretch with the nearly-complete Finch West light rail (LRT) line, whose opening date is currently uncertain [4, 5]. Through this section and up to Steeles, the surroundings are mostly residential and the route overlaps with TTC routes 46 and 927, though it does not provide local trips within the City of Toronto (i.e., being drop-off only when running south from Steeles and pick-up only when running north to Steeles). The neighbourhoods in this area are low-income relative to the rest of Toronto, while the neighbourhoods on the route north of Steeles Avenue (in Vaughan) have median incomes mostly similar to the whole city [6].

North of Steeles, the route serves some industrial sites, a row of car dealerships, and Holy Cross Catholic Academy. At Highway 7, it connects with Brampton Transit's Zum route 501, and YRT routes 77 and Viva Orange. North of Highway 7, the route's surroundings are mostly residential, with some industrial areas along Highway 27. Peak only route 10 ends in this area. The residential areas are interrupted by the Humber River valley north of Martin Grove Road's end, from which the bus runs along Highway 27 and Rutherford Road to Al Palladini. This report focuses primarily on the section of the route south of Steeles Avenue, particularly near its south end between areas near Humber College Bus Terminal and the Woodbine Centre shopping mall.

2.2 Service Levels

Headways between buses on the route as of March 2025 are displayed in Table 1. Times shown are approximate, as trips can run over an hour. In 2024, YRT proposed eliminating the existing weekday

service south of Humber College Bus Terminal, which would allow for improved weekday service on the rest of the route without adding additional vehicles [7]. They noted approximately 90 passengers (6%) travelled in the section south of Humber Polytechnic on the average weekday [7]. The change was expected to be implemented in January 2025 [8]. However, it was not implemented at that time.

Day of week	Time of day	Headway (mins.)	Proposal (mins.) [7]	Additional notes (existing service)
Weekdays	5 - 7 a.m.	28	23	The first northbound (NB) trip starts at 4:38, the first southbound (SB) at 5:06.
	7 - 10:30 a.m.	35-37	28	
	10:30 a.m. - 2 p.m.	60	49	
	2 - 7:30 p.m.	Generally 37-39	28	Headways typically around 33 minutes during the 2 p.m. hour
	7:30 - 11 p.m.	53-59	44	The last NB trip starts at 11:23 p.m., the last SB trip starts at 10:32 p.m.
Saturdays	8:30 a.m. - 12 p.m.	50	50	The first NB trip starts at 8 a.m., the first SB trip starts at 8:51 a.m.
	12 - 8:30 p.m.	50	50	
	8:30 - 10:30 p.m.	44-45	44-45	
Sundays	8:30 a.m. - 12 p.m.	50	50	The first NB trip starts at 8 a.m., the first SB trip starts at 8:51 a.m.
	12 - 8 p.m.	50	50	

Table 1. Service chart for YRT route 7 - Martin Grove (Appendix A).

The existing route in that area may not be running efficiently. South of Humber Polytechnic, route 7 runs circuitously as shown in Figure 1, requiring extra time. This diversion is also deep within Toronto, where the TTC (particularly route 927) may be a superior option. With the introduction of OneFare, passengers paying their fare by card no longer need to pay an extra fare to transfer to or from TTC routes, reducing the incentive to board a YRT bus further south. Presently, buses on route 7 spend 18 to 27% of their scheduled time south of Humber Polytechnic (Appendix A).

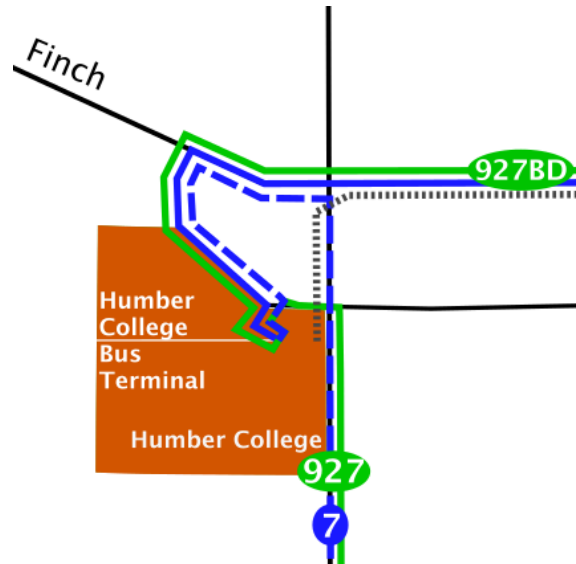


Figure 1. Circuitous routing of route 7 shown with the less circuitous route 927.

In YRT's Moving to 2025 plan, they envision a Frequent Transit Network (FTN), with routes running 15 minutes or better, Monday to Saturday from 6 a.m. until 10 p.m.. While route 7 is not directly in the FTN plan, a route on Highway 27 (the closest to which is route 7) is and YRT treats improvements to route 7 as part of implementing the FTN [9]. Over the past decade, YRT has made incremental improvements to some of these routes. The incremental nature of these improvements may be caused by York Region's unwillingness to fund YRT, as YRT noted budget cuts just before the COVID-19 pandemic [10]. During the pandemic, YRT noted examining every route to determine if they needed the resources they were given, resulting in service cuts [8]. With a government unwilling to fund YRT as much as it might need, growth has been slow and route 7 remains far from 15-minute service during all time periods.

2.3 Service Standards and Guidelines

While YRT does not have clear service standards or guidelines for passenger comfort, the TTC and Brampton Transit both do [11, 12]. The TTC recommends improving service if passenger loads on its buses exceed 95 percent of their recommended amount in the busiest hour of a service period in the busiest direction, which is 35 passengers off-peak (approximately a seated load) and 51 passengers during peak hours [11]. The guidelines Left Turn Right Turn prepared for Brampton Transit recommend ensuring all passengers get a seat off-peak due to longer waits, with 60-minute service being the minimum off-peak compared to 30 minutes during rush hours [12]. Given route 7 only runs every 30 minutes or better before 7 a.m., it is appropriate to use the off-peak standard unless service improves to at least every 30 minutes. The bus must also comply with regulations under the *Ontario Highway Traffic Act*, specifically Section 9 of O. Reg. 418/21 which requires buses travelling between municipalities (such as Route 7) to not have less than three seats per standing passenger [13].

YRT buses range in seating configuration. From many observations using the system and particularly route 7 - Martin Grove, the vehicles used on the route range in seated capacity from 36 to 38. To obey the *Ontario Highway Traffic Act*, these buses must carry a maximum of 48 to 50 passengers. Due to the route's low frequency, improvements should be made when passenger loads reach 36 to 38.

2.4 Ridership

Between spring 2020 and early 2024, YRT published bus crowding data on several popular routes, including 7 - Martin Grove [14]. While most of this data is lost, data obtained prior to the page being shut down showed crowding occurring in the early morning hours (5 - 7 a.m.) and in the early afternoon (1 - 3 p.m.), with early afternoon crowding sometimes surpassing an average of 60 passengers per bus [15]. The last batch of data had loads above 50 passengers during similar time periods.

However, this data and the more recently-released ridership count from York Region was nearly a year old by the time this study commenced. As well, it did not break down riders by which sections of the route they boarded the bus during. To remedy this, a survey of all weekday trips on the route south of Steeles was conducted throughout January 2025 over several different days to ensure the sample of trips was representative of all weekday trips. The crowding trends found were similar to the previous data but the percentage of riders travelling south of Humber Polytechnic was only three to four percent. A summary of the results can be found in Appendix B.

3.0 Problem statement

Presently, buses on route 7 run infrequently and are often too crowded. The most recent official data indicates crowding during the early morning and early afternoon is beyond regulatory limits, which themselves are beyond recommendations made by neighbouring transit agencies. More recent data shows several trips continuing to run with passenger loads above the aforementioned recommendations. The route also runs deep into the City of Toronto along a partly circuitous route, where the TTC may be a preferable option and especially considering one currently does not need to pay two fares to transfer from the TTC to YRT. Route 7 can and should run more efficiently by removing circuitous parts of the route and unnecessary route duplication, including with the TTC. The project's scope should be limited to changes to route 7 alone, as it is the only route in the area operated and funded by YRT. Surrounding routes may also be looked at to determine whether parts of route 7's service are duplicated.

4.0 Stakeholders

Apart from passengers, YRT, and York Region, there are other groups and organizations which may be impacted by routing changes, as shown in Table 2:

Stakeholder	Interest
City of Vaughan	Would benefit from improved access to Al Palladini C.C. and Pierre Berton Resource Library at the route's north end.
TTC	May benefit from riders using the TTC to connect with route 7, including increased ridership due to service improvements. May lose ridership if passengers choose to use route 7 over nearby routes to get to Steeles.
Operators	May benefit from an easier-to-navigate route, as well as bathroom facilities at the route's termini.
Surrounding communities	Would benefit from improved transit access. The impact of increased emissions is likely negligible, especially as YRT begins to purchase more electric buses [16].
Woodbine Centre	Would benefit from a convenient way to get to the mall.
Etobicoke General Hospital	Patients and employees would benefit from improved transit access to the hospital, both by improved service levels and in how close the transit is.
Humber Polytechnic	Students residing in Vaughan benefit from improved transit, less parking space may be needed due to increased passenger capacity on transit (space can be used for other purposes).

Table 2. Stakeholders potentially impacted by modifications to the route.

5.0 Alternative Routings

As the existing route is already circuitous, I did not examine it as a potential alternative routing. A more direct route south of Humber Polytechnic would serve the same areas and allow for a minor service improvement. Such a route was in use in 2019, suggesting the change may have been related to Finch West LRT construction [17]. Since Finch West LRT construction is now mostly complete, the route can be reverted to its original routing in the case the route should continue to serve Woodbine Centre.

With the guideline to allow all midday passengers to have a seat and the high existing ridership around 1 p.m., midday service should be improved to at least every 44 minutes, determined by assuming ridership demand would not increase due to the improved service and finding which level of service would cause all seats to be filled assuming a uniform distribution of passenger demand around 1 p.m.. Thus, if midday service is not improved to every 44 minutes or better by the route change, a bus must be added to give the route enough capacity to handle current demand.

The new weekday headways in minutes for each option assuming no extra service beyond what is necessary are shown in Table 3:

Time	Existing	Opt. 1	Opt. 2	Opt. 3A/D	Opt. 3B	Opt. 3C	Opt. 4
5 - 7 a.m.	28	26	23	22-23	23	22	20
7 - 10:30 a.m.	35-37	32	28-29	27-28	28	27	25
10:30 a.m. - 2 p.m.	60	37 (1 bus added)	33 (1 bus added)	32 (1 bus added)	33 (1 bus added)	31-32 (1 bus added)	40-41 (no bus added)
2 - 7:30 p.m.	Usually 37-39	32-33	28	27-28	28	27	24-25
7:30 - 11 p.m.	53-59	50	44	43	43-44	42	38

Table 3. Table of headways in minutes expected with each option.

5.1 Option 1: 2019 Routing

This option would preserve the route as it was in 2019 as shown in Figure 2, continuing to serve Woodbine Centre. A separate analysis would be required if this route is to be retained to determine whether weekend service to Woodbine Centre is warranted. One bus would need to be added during midday hours to meet guidelines.

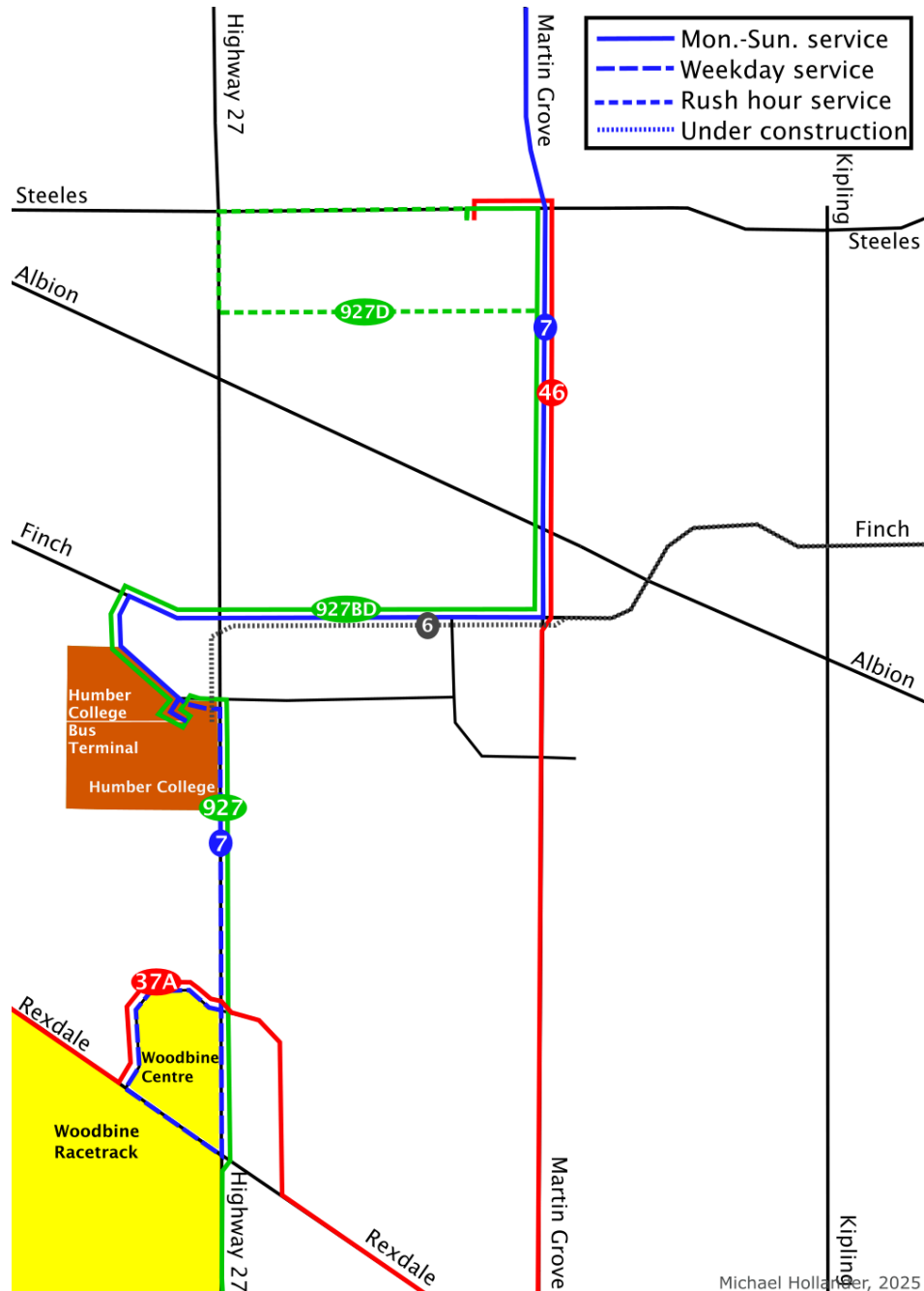


Figure 2. Option 1 reverts the route to what it was in 2019.

5.2 Option 2: 2024 Proposal

This option would leave the route as it is but remove service south of Humber Polytechnic as shown in Figure 3. Passengers travelling to Woodbine Centre will need to transfer to TTC route 927, which presently runs no less frequently than every 12 minutes [18]. One bus would need to be added during midday hours to meet guidelines.

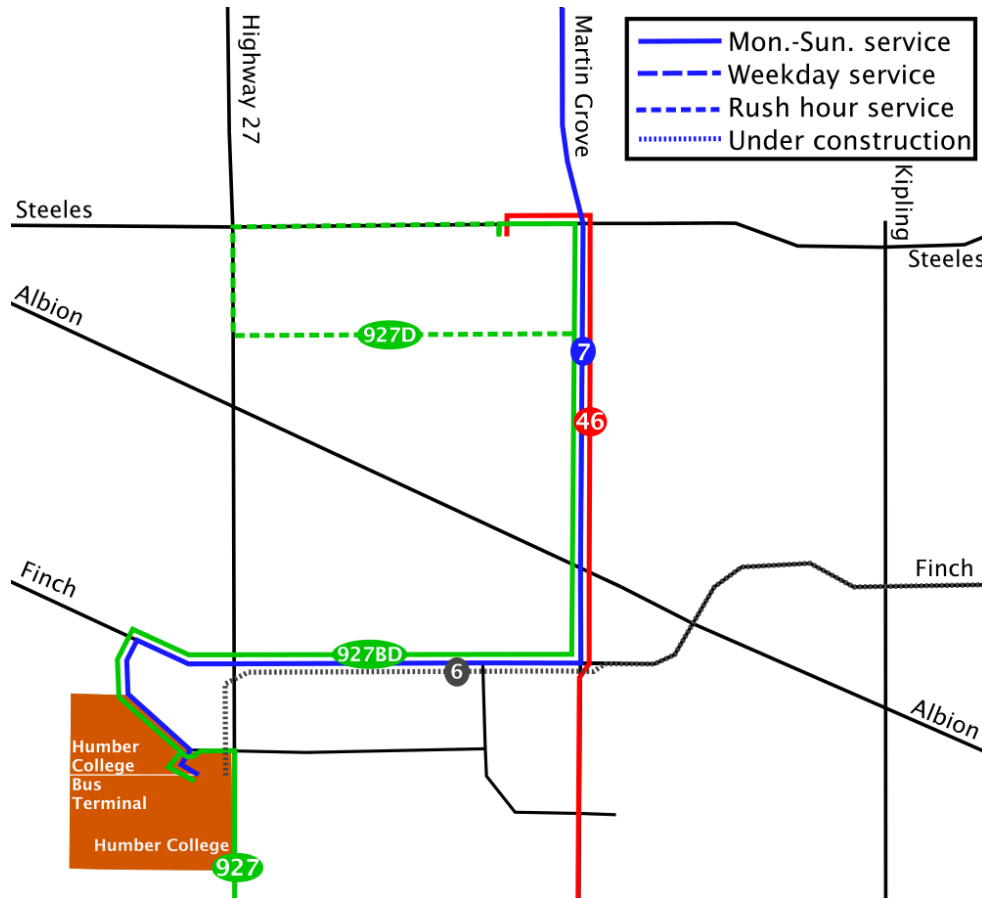


Figure 3. Option 2 discontinues the section south of Humber College.

5.3 Option 3: Modifications between Finch/Martin Grove and Humber

This option would end the route at Humber Polytechnic and additionally modify the route. As shown in Figure 4, this is done by adding a loop by taking the existing route in only one direction, or by removing the existing routing and running along an alternative both ways to Humber College. These routings seek to better serve Etobicoke General Hospital and simplify the routing to achieve minor service improvements. In all cases, one bus would need to be added during midday hours to meet guidelines.

Options 3A and 3B introduce a loop. In one direction, the route will run along the existing route as in Option 2. In the other direction, the bus will run directly to Finch on Highway 27 (3A) or along Humber College Blvd. to John Garland Blvd. (3B) to directly serve Etobicoke General Hospital. Options 3C and 3D avoid a loop, running along Highway 27 (3C) or Humber College Blvd. to John Garland Blvd. (3D) in both directions.

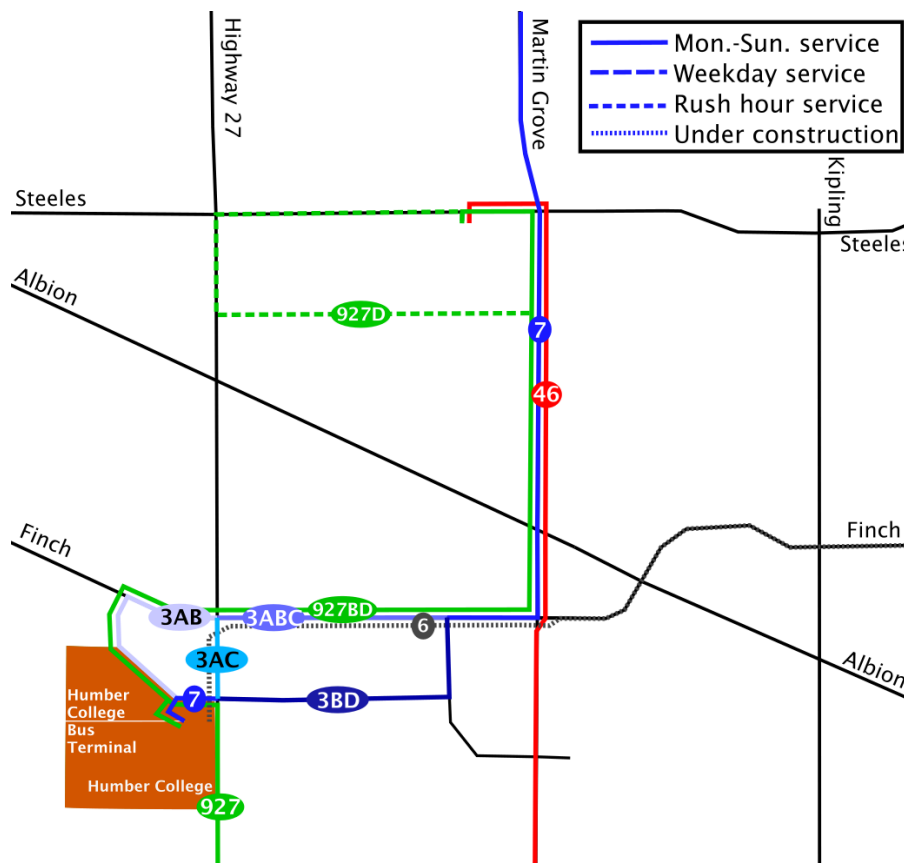


Figure 4. Option 3 modifies the existing route along or near Finch.

5.4 Option 4: Truncation at Finch & Martin Grove

This option would end the route at an on-street loop running along Albion Road, Finch Avenue, and Martin Grove Road, as shown in Figure 5. This would shorten the route, allowing for enough midday service to be implemented without increasing costs. Any passengers going to Humber Polytechnic or Etobicoke General Hospital will need to transfer to the Finch West LRT to continue their journey. Due to this option's reliance on the Finch West LRT, it can not be implemented until said LRT line opens.

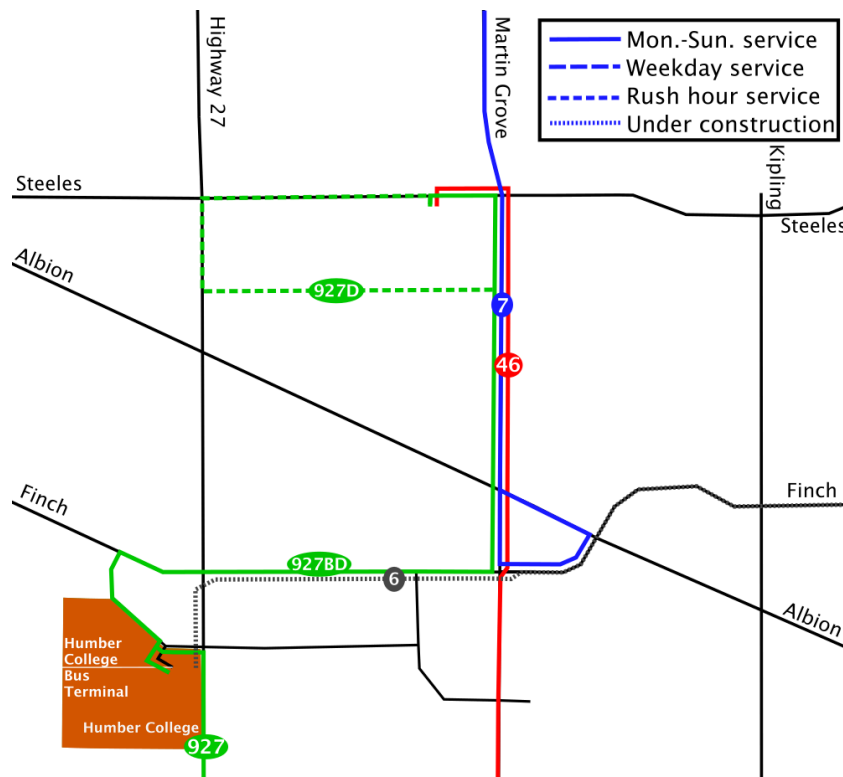


Figure 5. Option 4 ends at Finch & Martin Grove, forcing a transfer to the Finch West LRT.

5.5 Quickly Rejected Options

Two additional options were quickly rejected due to serious drawbacks of their implementation or lack of benefit. One would run up Highway 27 from Humber Polytechnic until Albion Road, then along Albion to Martin Grove. This route would be less direct than Option 3 and Highway 27 does not have good sidewalk infrastructure in this area. Another option would end the route at Steeles Avenue. This option was rejected as a majority of passengers in January 2025 travelled south of Steeles (Appendix B).

6.0 Selection of Preferred Alternatives

The impact of each alternative on a few potential goals were examined to determine which alternative would be best to implement: Which options were the most monetarily efficient, which would provide the best passenger experience assuming no additional resources added, and which would be best for the route's operations and operators.

6.1 Monetary Efficiency

When comparing the cost effectiveness of different alternatives, the 2019 schedule was used as the route then was the same as Option 1 and construction-related delays are no longer an issue with the completion of Finch West LRT construction, as was the case after 2019. At that time, the number of minutes spent in each route section of interest during a round trip is shown in Table 4.

Time of day (weekdays)	Between Humber Polytechnic and Woodbine Centre	Between Humber Polytechnic and Finch & Martin Grove	Total round trip
5 to 7 a.m.	10 minutes	14 minutes	89 minutes
7 to 10:30 a.m.	13 minutes	16 minutes	118 minutes
10:30 a.m. to 2 p.m.	13 minutes	16 minutes	95 minutes
2 to 7:30 p.m.	16-17 minutes	16-18 minutes	111-129 minutes
7:30 to 11 p.m.	10-13 minutes	12-13 minutes	77-90 minutes

Table 4. Number of minutes the bus spent in each section of interest during a round trip [17].

Comparing ridership per service minute of each of these sections helps determine which routing would allow for the most cost effectiveness. This is done under the assumption that the routing change would cause anyone travelling south of Humber College (or in option 4's case, Finch & Martin Gove) to avoid taking route 7, which is a greater ridership decline than what would happen as some passengers may choose alternatives to get to route 7.

- Buses on route 7 spent approximately 10-15% of their time south of Humber College. According to the January 2025 data, approximately 3.5% of passengers south of Steeles boarded or alighted in this area, suggesting the route would be significantly more cost effective if the section south of Humber College was removed (Appendix B).
- 40-50% of passengers south of Steeles went beyond Finch & Martin Grove, which requires approximately 25% of service hours. Thus, option 4 may not make the route more cost effective (Appendix B).
- A minority of trips taken during the study examined the area between Steeles Avenue and Highway 7 as well. In this area, an additional 33% of passengers boarded, reducing the share of passengers south of Humber to approximately 3% and the share beyond Finch & Martin Grove to around 35%, still greater than the 25% of the route's time spent in this area (Appendix B).

The analysis above does not account for passengers who may prefer to take route 927 or Line 6 to route 7 in the case route 7 is shortened. Whether they will would depend on how much longer they feel the new route is, as discussed in Section 6.2 Passenger Experience.

6.2 Passenger Experience

As part of the TTC's service standards, they note how passengers perceive the route they take and assign weights to wait time, walking time, transfers, and time spent aboard a vehicle. The weights are listed below [11]:

- Each minute of in-vehicle travel time: 1.0
- Each minute of wait time: 1.3
- Each minute spent walking: 1.8
- Each subway transfer: 1.0
- Each right-of-way surface transfer: 2.0
- Each mixed-traffic surface transfer: 6.0

For this analysis, "right-of-way surface transfers" was taken to mean any transfer where a route with a right-of-way was involved (such as an LRT line) or is completely within a bus terminal or fare-paid area.

With option 2, passengers from south of Humber College would spend 1-2 minutes fewer aboard a bus when compared to option 1 based on the existing route 927 schedule. However, they would spend approximately 6-9 extra minutes walking to the 927 and require a right-of-way transfer [19]. Based on the weights above, this would mean a perceived addition of approximately 14 minutes to their commute for the roughly three percent of passengers in this section. This does not vary by time of day. I doubt the wait time for 927 would be higher, as the route is frequent and will be supplemented south of Humber College Terminal by route 906 once Line 6 opens.

Along the rest of the route, headways will decrease slightly. This will especially impact industrial workers and Humber College students, a large portion of riders on the route. Both groups have their work or class ending at a particular time (though the effect is less for students, who could study on campus as well). When one is guaranteed to need to wait after a set time, the average wait time is around half the headway difference.

Not every passenger has no say in how much time they will need to wait, so this study conservatively assumed that $\frac{1}{4}$ of the headway difference will be the reduced wait time for all passengers. Assuming one bus is added during midday hours, this would remove 1 minute of waiting for the entire day, two during midday hours if a bus is not added. While this may not seem like much, weighing each passenger equally shows us that the effect of a one-minute reduction in wait time would have a mean effect of 1.30 among all passengers, compared to approximately 0.42 for the passengers at Woodbine Centre.

The above analysis assumes that all passengers from Woodbine Centre would still take the 7 and there would be no demand induced by better service, both of which would increase the total benefit and decrease the total drawback for passenger experience if they occur. Thus, option 2 is preferred over option 1 for this case.

As mentioned in Section 6.1 Monetary Efficiency, around 35% of passengers board at Humber College or along Finch west of Martin Grove. All these passengers would need to board the 927 or Line 6, and/or walk an extra distance if Option 4 is implemented. This would once again remove about 1 minute of wait time for all passengers, but add approximately 10 minutes of perceived time for the 35% boarding west

of Martin Grove, adding a significantly greater effect than the headway savings. Thus, options ending at Humber College are preferred over option 4 for passenger experience.

6.3 Operations

It is preferred for bathroom facilities to exist at terminals, to allow waiting passengers and drivers the opportunity to use it rather than needing to stop mid-route. The other end of route 7 has a bathroom as well, though the round trip time means operators might spend two hours without access to a bathroom. Woodbine Centre and Humber College both have bathroom facilities, with Humber being open earlier and closing earlier than Woodbine Centre based on several weekday visits. Fob readers were observed at Humber but not at Woodbine Centre. Opportunities for drivers to access Humber College buildings to use the bathroom if needed should be explored and would only require giving them a fob for the Barrett Centre for Technology Innovation, the closest building to Humber College Terminal.

Option 4 does not have any known bathroom facilities at the route's south end, but the reduced run time will mean drivers will only go about 1 hour 40 minutes without a bathroom break, rather than upwards of two hours currently during the AM rush hour.

6.4 Comparing Options 2 and 3

Options 2 and 3 both end at Humber College Terminal. Option 2 provides direct access to a Purolator warehouse which also has frequent combined service from Humber College Terminal provided by TTC routes 96A/96D and 927B/D as well as Brampton Transit routes 11/11A, 50/50A, and 511/511A/511C. Their service levels are noted in Table 5, with weekend early morning numbers excluded as 7 does not run at that time. Different transit agencies have different definitions of the following time periods.

Day of week	Time\Route	96A	927B/D	11/11A	50/50A	511/511A/C
Weekday	AM Peak	18 mins	10 mins	10 mins	12 mins	7.5 mins
	Midday	20 mins	9.5 mins	20 mins	20 mins	10 mins
	PM Peak	20 mins	10 mins	8 mins	13 mins	7.5 mins
	Early Evening	20 mins	10 mins	30 mins	15 mins	15 mins
	Late Evening	20 mins	12 mins	30 mins	20 mins	20 mins
Saturday	Late Morning	20 mins	11 mins	30 mins	30 mins	15 mins
	Afternoon	17 mins	8 mins	30 mins	30 mins	12 mins
	Evening	20 mins	12 mins	30 mins	40 mins	20 mins
Sunday	Late Morning	20 mins	10 mins	30 mins	30 mins	20 mins
	Afternoon	20 mins	11 mins	30 mins	30 mins	20 mins
	Evening	20 mins	12 mins	30 mins	40 mins	20 mins

Table 5. Headways of routes running to or past the industrial area currently served by route 7 [18, 20].

If the TTC allows trips to be taken within the City of Toronto by other agencies (i.e. open-door policy), this would allow users to take routes which combined would never have less than 13 buses running on them per hour outside of night hours. The change in perceived time due to the routing change would be very minor, though perceived time may increase due to the short transfer (or the added walk if they would prefer to walk). I am aware that the schedules for these routes may not necessarily align, but eight buses per hour is also the worst level of service. On weekdays, it is never less than 15 (and usually 20 or more). On Saturdays, never less than 14.

With that in mind, an average transfer wait of 4 minutes was assumed. The people impacted are industrial workers, who typically do not have a say in when they start or end work. Thus, their wait time matters. This would increase the perceived trip time by approximately 5.5 minutes for these passengers. By comparison, the nearest 7 stop is 4-6 minutes' walk away from a stop in front of Etobicoke General Hospital, suggesting a 9-minute perceived increase for its passengers, or 7.5 minutes if they take route 96A/B/D, which runs approximately every 10 minutes for most of the day.

It should be noted that these numbers exclude the minor service improvement caused by option 3, which would lower the perceived time by about a minute, so the differences are an increase of 5 minutes for Purloator warehouse passengers and a decrease of 8-9 minutes for Hospital passengers, as well as a 1-minute decrease for everyone else.

Options 3A and 3B suggest running a loop, where the Purolator warehouse is only served in one direction and the hospital is served in the other direction. Due to the wait time at Humber College Terminal, there will not be an increase in convenience over simply walking. Options 3C and 3D require approximately three new bus stops along their routes, adding a minor construction cost and potentially causing minor delays in implementation. Several TTC stops along Humber College Blvd. will need to have YRT markers added for option 3D to be implemented, adding a more minor installation cost. Bus stops used by YRT usually use sidewalk concrete, which based on a 2018 City of Toronto cost estimate and adjusted for inflation, the cost would certainly be under \$5,000 [21, 22]. This is a minor cost and thus should not influence the total cost.

7.0 Preferred Alternatives

Due to its convenience for Etobicoke General Hospital passengers and only minor effect on service level compared to option 3C, option 3D is the preferred option. However, with demand for route 7 trips to Etobicoke General Hospital untested, option 3C and option 2 may be better alternatives if hospital demand is found to be low.

Option 3D would run on Humber College Blvd. east from Humber College Terminal, running directly in front of Etobicoke General Hospital. Bus stops will be placed in front of the hospital as shown in Figure 6. From there, the bus will run to John Garland Blvd. then along John Garland Blvd. to Finch, at which point it will resume its existing routing. This option serves Etobicoke General Hospital, but does not serve the industrial areas northwest of Finch Avenue and Highway 27, which would require use of other routes as noted in section 6.4 or a short walk.

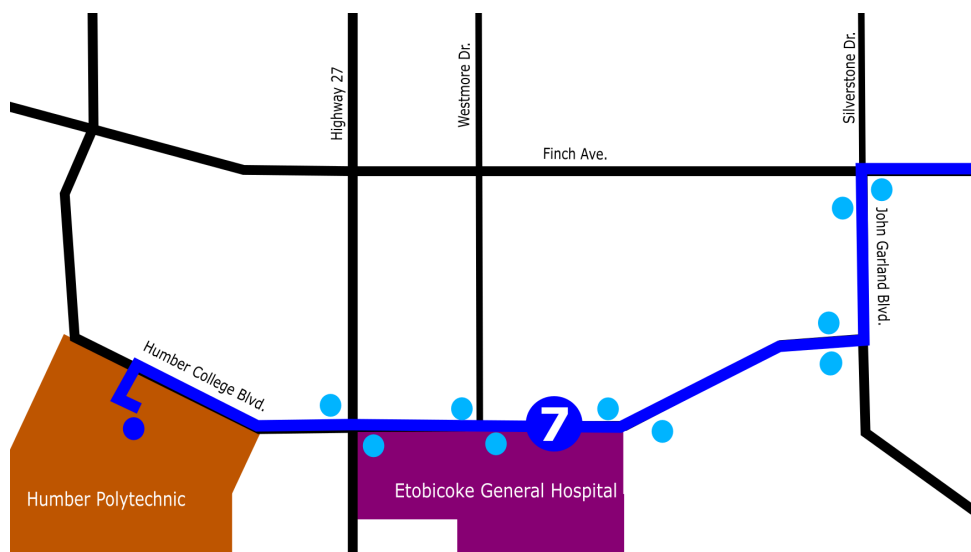


Figure 6. A detailed view of Option 3D. Proposed bus stops are sky blue, existing stops are blue.

Option 3C would run east on Humber College Blvd. like Option 3C but would go north on Highway 27, just before Etobicoke General Hospital. Bus stops would be proposed along Highway 27 as shown in Figure 7, closer to Etobicoke General Hospital and the industrial areas northwest of Finch Avenue and Highway 27 than existing stops served by this option are.

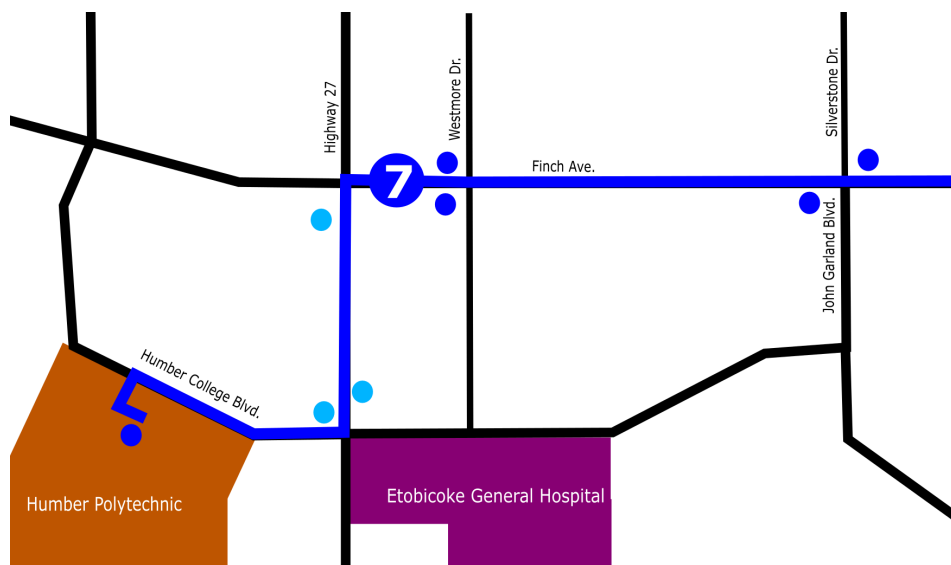


Figure 7. A detailed view of Option 3C. Proposed bus stops are sky blue, existing stops are blue.

Option 2 would retain the existing route north of Humber Polytechnic with no new stops being added, as shown in Figure 8. The route would run closer to the industrial areas northwest of Finch Avenue and Highway 27, but a few hundred metres' walking away from Etobicoke General Hospital.

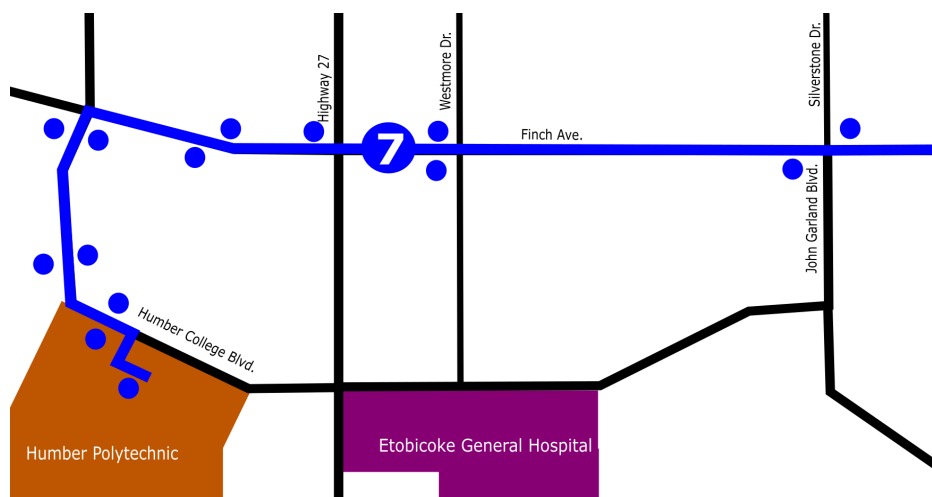


Figure 8. A detailed view of Option 2. Existing stops are blue.

8.0 Conclusion and Next Steps

This document highlights the information and thought process through primary and secondary research and how that data was used to determine the best routing options for YRT Route 7 - Martin Grove. While it is unclear which route is the best one due to limited information on demand to specific destinations such as the Purolator warehouse and Etobicoke General Hospital, it is clear that a change would benefit passengers no matter which alternative is implemented. A follow-up study should be conducted after implementation some time during the academic year to determine how ridership is impacted by the change, while taking Humber Polytechnic students into account as was done in this study.

During the drafting of this report, YRT's new schedules effective April 27, 2025 were released, confirming the implementation of Option 3C without any new bus stops as shown in Figure 10, with minor headway differences (at most 2 mins) from those listed in Table 3 [23]. Particular attention will be paid to the areas near the route change in the follow-up study.

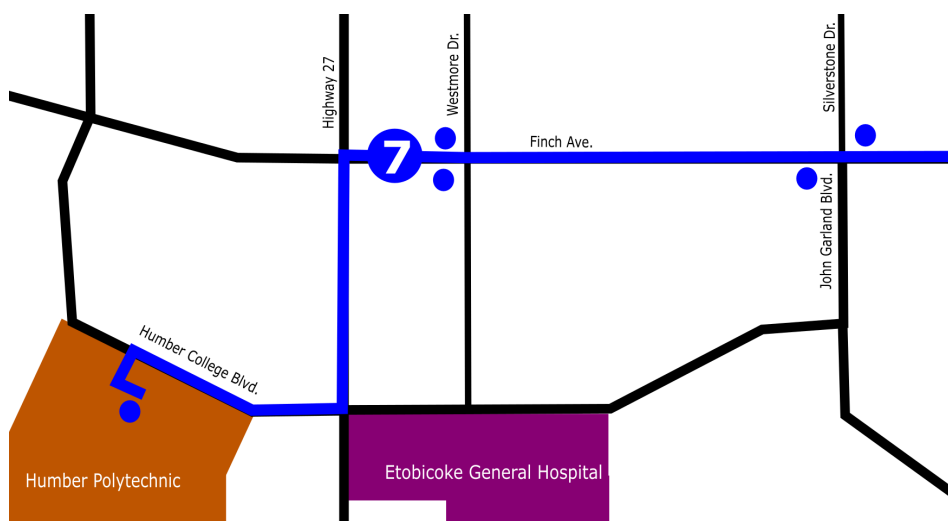


Figure 9. A detailed view of Option 3C as implemented by YRT effective April 27, 2025 [23].

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Appendix A. Existing Schedule

LAYOVER	HEADWAY	RUN TIME	RUN TIME N OF HUMBER	4944 QUEENS PLATE	6951 HUMBER COLLEGE	5265 MARTIN GROVE / FINCH	3515 STEELES	3525 HWY 7	3531 MORNING STAR	4411 AL PALLADINI CC	HEADWAY AT ROUTE END
-	-	00:49	00:39	04:38	04:48	04:56	05:02	05:05	05:10	05:27	-
-	00:28	00:49	00:39	05:06	05:16	05:24	05:30	05:33	05:38	05:55	00:28
-	00:28	00:49	00:39	05:34	05:44	05:52	05:58	06:01	06:06	06:23	00:28
00:06	00:28	00:49	00:39	06:02	06:12	06:20	06:26	06:29	06:34	06:51	00:28
00:06	00:28	00:49	00:39	06:30	06:40	06:48	06:54	06:57	07:02	07:19	00:28
00:05	00:25	01:04	00:48	06:55	07:11	07:20	07:26	07:30	07:37	07:59	00:40
00:14	00:39	01:04	00:48	07:34	07:50	07:59	08:05	08:09	08:16	08:38	00:39
00:05	00:37	01:04	00:48	08:11	08:27	08:36	08:42	08:46	08:53	09:15	00:37
00:05	00:35	00:55	00:43	08:46	08:58	09:07	09:14	09:18	09:23	09:41	00:26
00:05	00:36	00:55	00:43	09:22	09:34	09:43	09:50	09:54	09:59	10:17	00:36
00:05	00:36	00:55	00:43	09:58	10:10	10:19	10:26	10:30	10:35	10:53	00:36
00:08	00:32	00:54	00:40	10:30	10:44	10:52	10:58	11:02	11:08	11:24	00:31
00:05	00:58	00:54	00:40	11:28	11:42	11:50	11:56	12:00	12:06	12:22	00:58
00:06	01:00	00:56	00:42	12:28	12:42	12:52	12:58	13:03	13:08	13:24	01:02
00:08	01:00	00:56	00:42	13:28	13:42	13:52	13:58	14:03	14:08	14:24	01:00
-	00:43	00:56	00:42	14:11	14:25	14:35	14:41	14:46	14:51	15:07	00:43
00:14	00:23	01:04	00:48	14:34	14:50	15:00	15:08	15:13	15:19	15:38	00:31
00:20	00:38	01:04	00:48	15:12	15:28	15:38	15:46	15:51	15:57	16:16	00:38
00:11	00:38	01:04	00:48	15:50	16:06	16:16	16:24	16:29	16:35	16:54	00:38
00:11	00:38	01:11	00:50	16:28	16:49	17:00	17:06	17:11	17:18	17:39	00:45
00:11	00:38	01:11	00:50	17:06	17:27	17:38	17:44	17:49	17:56	18:17	00:38
00:06	00:38	01:06	00:46	17:44	18:04	18:13	18:19	18:23	18:29	18:50	00:33
00:06	00:38	01:06	00:46	18:22	18:42	18:51	18:57	19:01	19:07	19:28	00:38
00:09	00:38	00:52	00:38	19:00	19:14	19:21	19:26	19:30	19:36	19:52	00:24
00:09	00:38	00:52	00:38	19:38	19:52	19:59	20:04	20:08	20:14	20:30	00:38
00:05	00:59	00:52	00:38	20:37	20:51	20:58	21:03	21:07	21:13	21:29	00:59
00:05	00:59	00:51	00:37	21:36	21:50	21:57	22:02	22:06	22:12	22:27	00:58
00:05	00:53	00:43	00:33	22:29	22:39	22:46	22:50	22:53	22:58	23:12	00:45
00:05	00:54	00:43	00:33	23:23	23:33	23:40	23:44	23:47	23:52	00:06	00:54

LAYOVER	HEADWAY	RUN TIME	RUN TIME N OF HUMBER	4411 AL PALLADINI CC	3550 MORNING STAR	3558 HWY 7	3568 STEELES	4490 FINCH/MARTIN GROVE	6951 HUMBER COLLEGE	4944 QUEENS PLATE	HEADWAY AT ROUTE END
-	-	00:50	00:40	05:06	05:26	05:31	05:35	05:40	05:46	05:56	-
00:07	00:28	00:50	00:40	05:34	05:54	05:59	06:03	06:08	06:14	06:24	00:28
00:05	00:26	00:50	00:40	06:00	06:20	06:25	06:29	06:34	06:40	06:50	00:26
00:07	00:30	00:50	00:40	06:30	06:50	06:55	06:59	07:04	07:10	07:20	00:30
00:05	00:26	01:10	00:57	06:56	07:26	07:34	07:39	07:46	07:53	08:06	00:46
00:12	00:35	01:10	00:57	07:31	08:01	08:09	08:14	08:21	08:28	08:41	00:35
00:08	00:36	01:10	00:57	08:07	08:37	08:45	08:50	08:57	09:04	09:17	00:36
00:05	00:36	01:10	00:57	08:43	09:13	09:21	09:26	09:33	09:40	09:53	00:36
00:05	00:36	01:02	00:51	09:20	09:47	09:54	09:58	10:04	10:11	10:22	00:29
00:14	00:35	01:02	00:51	09:55	10:22	10:29	10:33	10:39	10:46	10:57	00:35
00:13	00:35	00:53	00:42	10:30	10:52	10:58	11:01	11:06	11:12	11:23	00:26
END											
00:05	00:59	00:53	00:42	11:29	11:51	11:57	12:00	12:05	12:11	12:22	00:59
00:07	01:00	00:51	00:40	12:29	12:49	12:55	12:58	13:03	13:09	13:20	00:58
00:05	01:00	00:51	00:40	13:29	13:49	13:55	13:58	14:03	14:09	14:20	01:00
-	00:32	00:51	00:40	14:01	14:21	14:27	14:30	14:35	14:41	14:52	00:32
00:10	00:33	01:05	00:48	14:34	15:00	15:06	15:10	15:15	15:22	15:39	00:47
00:05	00:38	01:05	00:48	15:12	15:38	15:44	15:48	15:53	16:00	16:17	00:38
00:12	00:38	01:05	00:48	15:50	16:16	16:22	16:26	16:31	16:38	16:55	00:38
00:12	00:38	01:10	00:52	16:28	16:57	17:03	17:07	17:13	17:20	17:38	00:43
00:12	00:38	01:10	00:52	17:06	17:35	17:41	17:45	17:51	17:58	18:16	00:38
00:05	00:38	01:07	00:49	17:44	18:10	18:16	18:20	18:26	18:33	18:51	00:35
00:05	00:38	01:07	00:49	18:22	18:48	18:54	18:58	19:04	19:11	19:29	00:38
00:10	00:38	00:56	00:39	19:00	19:20	19:24	19:27	19:33	19:39	19:56	00:27
00:08	00:36	00:56	00:39	19:36	19:56	20:00	20:03	20:09	20:15	20:32	00:36
END											
00:05	00:59	00:56	00:39	20:35	20:55	20:59	21:02	21:08	21:14	21:31	00:59
00:05	00:59	00:50	00:36	21:34	21:53	21:57	22:00	22:05	22:10	22:24	00:53
00:05	00:58	00:46	00:34	22:32	22:50	22:54	22:56	23:01	23:06	23:18	00:54
END											
END											

Figure 9. Existing weekday northbound (top) and southbound (bottom) schedules for YRT Route 7 - Martin Grove. Schedules taken from YRT's trip planner [24].

Appendix B. Summary of January 2025 Weekday Ridership

Sample size (weighted, all passengers travelling to/from Steeles or further south): Approximately 511 passengers southbound, 659 passengers northbound. If a trip was taken n times, its weight is $1/n$.

Dates travelled: Jan. 8 - 27, 2025. Percentages below are weighted. Percentages may not add to 100% due to rounding:

- 13.4% of trips on Mondays
- 36.0% of trips on Tuesdays
- 1.2% of trips on Wednesdays
- 13.4% of trips on Thursdays
- 36.3% of trips on Fridays

Of the passengers south of Steeles:

- 3.4% travelled south of Humber Polytechnic northbound, 3.6% southbound
- 33.3% travelled from Humber Polytechnic northbound, 21.3% travelled there southbound
- 20.1% travelled from somewhere between Humber Polytechnic and Finch & Martin Grove (exclusive) northbound, 24.9% travelled there southbound
- 34.4% travelled from along Martin Grove south of Steeles northbound, 37.9% travelled there southbound
- 8.7% travelled from Steeles northbound, 12.2% travelled there southbound

Times of day with busy (>35 passengers) trips:

- 5 - 8 a.m. (northbound)
- 8:30 a.m. (southbound)
- 1 - 3:30 p.m. (northbound)
- 3:30 - 4:30 p.m. (southbound)

Weighted sample size (trips north of Steeles to Highway 7): Approximately 495 passengers, of which 25.3% did not travel to Steeles or further south.