Public Transport: Is Montreal ready for the world stage?

Description

An outside the box solution to moving people around our metropolis

By **Henry Olders**

Mayor Valérie Plante made a campaign promise to build a new Montréal Métro "Pink Line" which would be completed in 2025 at an estimated cost of $5.9 billion, or $280 million per kilometre for its 21 km length. That may be a serious underestimate. According to the *Montreal Gazette*'s David Rudin, other cities have experienced significantly higher costs per km for their metro projects.

Montreal's other large public transport project, the Réseau express métropolitain (REM), a light rail system for which construction began in spring 2018, will be 67 km long, and is estimated to cost $6.3 billion, or $94 million per km.

Those are very expensive projects! Are they worth the money? Especially since the public will be paying! Never mind the environmental concerns and the disruptions that the REM is already causing. Let's look at some numbers. One way of rating transportation systems is by their carrying capacity, expressed as the number of passengers per hour per direction (PPHPD). For the proposed Pink Line, this maxes out at just over 33,000 (an Azur train every 2 minutes). As for the REM, the theoretical maximum would be 24,000 PPHPD, based on a train every 90 seconds. But that would need a whole lot of trains to cover 67 km of track!

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Compare this to buses operating on city streets, with a typical PPHPD of 1350. Or multilane highways, which can have capacities of 2000 cars per lane (3000 people), so perhaps 9000 people per hour for 3 lanes. But buses and cars are noisy, smelly, and polluting!

So for moving many people in a way that respects the environment, métro lines and light rail systems may be the way to go. Gotta say, though, these systems are boring and old hat! Former Montréal mayor Jean Drapeau probably believed that the Montréal Métro system would be his major legacy, but he is now mostly remembered for "The Big Owe", the Olympic Stadium for which citizens are still paying!

If Mayor Plante truly wants her administration to be remembered for something remarkable AND positive, here's an idea: build an aerial cable car system for urban transport. With over 100 such systems operating in urban environments, this technology is experiencing a remarkable renaissance. And let's not forget that, with so many cable car systems operating at ski resorts all over the world, Montréal's winter climate will be a piece of cake!

This article discusses some of the issues in adapting aerial cable car technology to the urban transport setting. Doppelmayr's 3S Gondola lifts can take 5000 passengers per hour in each direction, with detachable gondolas each carrying up to 35 passengers, at speeds of 7.5 m/s (27 kph). Higher capacities are certainly possible: two-level gondolas, for example, when used with two-level stations can minimize "dwell time" (the time a vehicle spends at a stop to load and unload passengers). Doors on both sides can also reduce dwell time. And with a gondola arriving every 24 seconds or so, the passenger line-up would be pretty well continuously on the move. You always feel as if you're going somewhere!

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These systems have proven exceedingly safe, energy efficient, and quiet. And of course, in a province blessed with clean and inexpensive hydro power, all-electric operation is a bonus!

How much do 3S (tri-cable) systems cost? One estimate arrives at between US$10 and $24 million per km. An order of magnitude less than the pink line metro!

But why stop with the basics? We can build for the future. A 3-cable system can accommodate a mix of different gondola designs: seated accommodations, standing room, space for luggage, racks for bicycles, etc. A two-level gondola can ensure physical separation between people and their bicycles or baggage.

And, tourists just love gondolas with glass floors and open-air upper decks! What about gondolas that slowly rotate?

There's no reason to limit cable car systems to moving people. Especially during non-peak hours, gondolas for transporting goods could be swapped in, including container gondolas that can be trans-shipped onto trucks. There are already existing systems which can transport passenger cars. In the near future, when autonomous vehicles are common, one might envision a mode in which a pod, individually customizable by its owner to be an office, a living space, a delivery van, or simply passenger accommodation, could be automatically unhooked from a gondola and placed on a rented autonomous vehicle platform of standardized design, fully charged and ready to go.

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But not everybody will like the concept. Ten years ago, the Port of Montreal rejected a proposal. And even though these systems are safer than other modes of public transport, and certainly much safer than going by car, many are uncomfortable with the idea of being way up in the air. Acrophobia is a real thing!

Well-chosen routes can go a long way towards widespread acceptance, however. Here's one suggestion for Montreal.

With a terminus at Cavendish Mall, the next stop would be the old Blue Bonnets site with its proximity to shopping, housing, commerce, and light industry. Then crossing through Côte des neiges with a station on Victoria avenue at Plamondon, another at the Jewish General Hospital, then the Université de Montréal campus,

two stations on top of Mount Royal, one at Beaver Lake and the other by the Belvedere. Descending the mountain to the McGill University campus, on to Place des Arts and Place des Festivals, a stop at the new CHUM superhospital, then the Old Port, and then across the St. Lawrence River to the Université de Sherbrooke campus near the Longueuil Métro, and finally to a terminus at Place Longueuil. Total distance: 14.6 km. At $24 million per km, that works out to US$350 million. Cheap, even with the low value of the Canadian dollar.

Gondola entering building in Singapore (cropped) – Image: pelican Attribution-ShareAlike 4.0 International (CC BY-SA 4.0)

Detachable gondolas can be shunted on or off the system at any station, or even turned around. This means that “express” cars could start and stop at popular destinations with no intermediate stops. Between the new CHUM hospital and the Université de Montréal campus, a distance of 4.8 km, would take less than 11 minutes. Beats 25 minutes by automobile, or 39 minutes by existing public transport!

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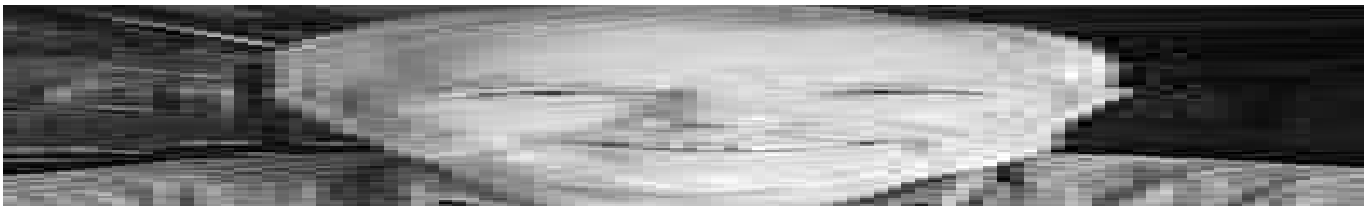
My route suggestion above should attract commuters, sightseers and tourists. To minimize expropriations where it passes through built-up areas, it’s possible to build stations on top of existing commercial buildings like supermarkets or malls, or even inside of highrises, as in Singapore. Great for business!

Another route, easier to build on, would be along the CN Rail right-of-way that stretches from the eastern tip of Montréal Island pretty well all the way to downtown. The rails have already been torn up for a large part of the distance. A 3S gondola system linking Pointe-aux-Trembles to downtown, a distance of about 25 km, would be relatively inexpensive, as its height would only have to be sufficient for road traffic to pass underneath for the many streets which cross the right-of-way.

So, Montreal, what are we waiting for? Let’s work together to put our great city back on the map again!

Feature image: Roosevelt Island Tram – courtesy Roosevelt Island Operating Corporation



Henry Olders, psychiatrist and engineer, Westmount resident since 1993, is a former president of the Westmount Municipal Association. He is researching dietary strategies to increase healthy longevity and has formulated a unique hypothesis on how and why ageing occurs. Other interests include artificial intelligence (he has developed a neural network based pattern classifier). Blissfully married to Helen Rainville, musician, with whom he enjoys singing and riding a tandem bicycle.

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Date Created
October 2018