TRANSIT PARADOX

Rob Jowett

New mass transportation construction methods and political interference in transit planning decisions are the biggest reasons for the rising costs of subway and LRT construction, a new report from the **Residential and Civil Construction Alliance of Ontario** (RCCAO) says.

There have been nine subway and LRT construction projects completed in the **City of Toronto** to date, beginning with the Yonge Line which opened in 1954. Another six projects are currently under construction or being planned. In the past 20 years, the costs of building subway or LRT tunnels and stations have increased significantly compared to earlier projects, which has led to significant criticism of the governments and agencies involved, and made approval of future projects more challenging to gain.

The report compares the costs of the city's first seven subway and LRT projects, up to the opening of the Downsview extension in 1996, to those that followed. When adjusted to 2019 dollars, each of the first seven major transit projects completed before 1996 cost somewhere between $83-million and $112-million per kilometre to build. By contrast, the city's two more recently completed projects: the Sheppard subway line, which opened in 2002, cost the city $203.1-million per kilometre to build, and the Toronto-York Spadina Subway Extension (TYSSE-the extension of the University line to Vaughan, which opened in 2017) cost $383.7-million per kilometre. The cost of future projects, such as the proposed Ontario Line, the Scarborough Subway Extension, and the Yonge North extension to Richmond Hill are projected to cost $703.2-million, $723.7-million, and $756.8-million per kilometre respectively.

"One of the key things that we found early on was that in the 20th century, subway-building… very rarely involved the tunnels," report author and transit researcher and journalist **Stephen Wickens** told *NRU*. "We either built these shallow box tunnels with cut-and-cover construction, or we used open trenches… But in the 21st century, we totally ignore the possibilities of using cut-and-cover. We go with these tunnel-boring machines that go really deep. And it appears that that's where [costs begin to rise]."

Wickens says that in addition to the change in construction methods, subway stations have become much larger and almost turned into underground buildings because they are being built so far underground, in some cases, to depths the equivalent of seven storeys.

New methods for constructing subways are also far slower than they were in the past: the original Yonge Line was built at a rate of 1.6-kilometres of track and 2.7 stations per year, and the University-Bloor-Danforth line, which opened in 1966, was built at a rate of 2.6-kilometres of track and four stations per year. In contrast, the TYSSE was built at a rate of 1.1-kilometres of track and 0.7 stations per year.

The main reason for the changing construction methods is the decreasing public tolerance for the kind of surface-level disruption caused by the construction. According to Wickens, construction-related disruptions to street activity became increasingly unacceptable during the 20th century, even as improvements to deep tunnel boring technology improved timelines and lowered costs. The report notes that a TTC spokesperson told Wickens that the organization considers cut-and-cover construction to be more costly than boring and did not consider it as a possible construction method when building the Toronto-York Spadina Subway Extension.

"Toronto is certainly becoming more dense, and the disruption [caused by cut-and-cover construction] the public would experience now would be different than, 40, 50, 60 years ago when even Toronto's financial district wasn't as built up as it is right now," RCCAO executive director **Andy Manahan** told *NRU*. "In the downtown core, the Ontario Line would have to go deep, and I think [tunnel boring] would be more cost-

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effective because there are so many water utilities that are, you know, the core parts of the city that [it] will be best just to avoid them."

Wickens says he agrees that the central part of the Ontario Line will need to be built deep underground, especially as it also crosses existing subway lines. However, he says most of the benefits associated with deep tunnel boring, such as reduced surface disruption, are eliminated by the much higher cost of the technology, and it still causes significant disruption on the surface.

Compounding the problems of rising costs of construction, increasing political involvement in transit decision-making has pushed the costs of projects up, Wickens found. He says rather than presenting decision-makers with a series of potential projects to assess which makes the most sense, politicians are deciding in advance which projects to back based on political calculations or campaign promises.

"Obviously, politicians have [an] important role. They need to be the ones who decide which projects get funded or approved," says Wickens. "But what's happened is that we seem to have really messed up the whole process of assessing which projects are worthwhile. And we basically are deciding which projects we're going to build, and then studying them."

Manahan says in particular, the planned Scarborough Subway Extension has been subject to considerable political interference which has delayed or altered the project several times. Originally it was planned to be an LRT, but in 2012, this plan was replaced with a subway in Toronto's OneCity transit plan, which was subsequently rejected by the provincial government. The provincial government then said it would fund a three-stop extension, which was then reduced to one stop by city staff. Currently, **Metrolinx** and **Infrastructure Ontario** are planning a three-stop extension following a decision by the current provincial government.

"It's not just the dollar cost," says Manahan. "It's the opportunity cost, I think, where we've missed out to a certain degree on a generation of building where we just weren't doing very much from the 80s to the early 2000s."

Wickens identified secondary factors that have also contributed to raising the costs of transit projects, such as approval and study delays caused by factors other than political interference, rising labour and materials costs, construction productivity (the output of one person, machine, etc), and the public-private-partnership financing model. However, he says these factors are much less significant than the construction methods being used and ongoing political interference.

"We are arguably some 30 years behind where we should have been had we been paying attention to transit all along," **Harmonize Mobility** co-founder and chief mobility officer **Bern Grush** told *NRU*. "To make matters worse, we have focussed building downtown with buildings that draw lots of workers all at the same hour of the morning in subways that were designed for the 60s, and that can no longer handle the load. On top of that, we want to add subways in from the suburbs, which would make that fundamental problem worse. But we can't not pay attention to this, because congestion has also gotten out of hand by a long shot."

Grush says Toronto has not effectively balanced city-building and transportation, and the situation regarding transit is far worse here than it is in other cities. He adds that the COVID-19 pandemic is likely to lead to significant changes in the way people work and how many workers will commute each day in the future, meaning that many of the business cases and other underlying studies supporting individual projects will no longer be relevant and many projects could re-assessed yet again.

"What we have is the perfect storm given by naturally compounding costs that far outrun inflation… and the decades of added political and planning errors," says Grush. "The problem would have been bad due to natural processes, but we managed to make it so much worse. This is like COVID-19—there was a process that was destined to bring the virus around the world, but there are many delays, decisions, and missing preparations that made it so much worse."