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Toronto transit riders expect connected, personalized and data-driven transport services

CONNECTIVITY OUTLOOK 2020 — TORONTO REPORT

BAI Communications' 2020 Connectivity outlook report asked more than 2,400 transit riders in five global cities (Toronto, Hong Kong, London, New York and Sydney) how they saw the state of transport, connectivity and its role in their communities' future. It arrived at three high-level findings:

Advanced network infrastructure is the key to a smart city.

Data-driven services make transportation safer, smarter and more efficient.

Connectivity gives citizens control over their time, their work and their wellbeing.

> **Pervasive and seamless connectivity is a cornerstone of smart transit systems, particularly in multimodal systems like Toronto's which rely heavily on its subway system.**
>
> **— Professor Amer Shalaby,**
> **Director, Transit Analytics Lab, University of Toronto**
> **Transportation Research Institute (UTTRI)**

The COVID-19 pandemic has sharply reduced public transport ridership in much of the world. For operators, rebuilding public trust in its safety is a paramount concern. At the same time, many governments are looking at infrastructure projects to kick-start their economies.

Public transport authorities have a unique opportunity to build 'smart' infrastructure. Connected, personalized, data-driven services are the key to creating the 'station of the future' and rebuilding people's confidence in their public transport systems' safety, reliability and efficiency.

In 2019, we saw that Toronto transit riders had high expectations of their city and its transport systems. They wanted connectivity and innovation to be part of their day-to-day travel experience. In 2020, those expectations remained, with reliable underground connectivity and tailored information services given high priority.

Torontonians want smart infrastructure and dependable, safe transit

Globally, 91% of transit riders believe that technology can fuel innovation and a similar majority (91%) believe that world-class cities should have seamless cellular coverage above and below ground. Yet less than two-thirds of Torontonians believe they live in a smart city (62%; global average 70%) highlighting the importance of continued innovation and investment in smart infrastructure and technology.

Torontonians highly value connectivity. Before the COVID-19 pandemic, some 100,000 transit riders logged in to BAI's subway Wi-Fi network in the Toronto Transit Commission (TTC) each day. This network is leveraged to assist with solutions that improve security, such as the SafeTTC app. Torontonians had the highest expectations globally for their transit networks to be safe (82%; global average 77%).

This requirement for connectivity and its value goes beyond travel. Toronto transit riders joined the 91% of global respondents who supported government authorities investing in new and reliable wireless and fibre networks. They also had the strongest belief globally that city and infrastructure planning could be improved with better technology and connectivity (56%; global average 48%).

These investments are expected to be made by more than just government. Nearly four in five respondents (79%) would think less of a mobile carrier if it did not deliver high-quality mobile signals across transit networks and 69% would consider changing carriers if a competitor had better coverage on these networks.

When Torontonians were asked which of the following are features they expect from a rail network:

82%
said safety

81%
said reliability

> "I would feel safer on the subway knowing I always have a connection. I would also feel more comfortable not getting lost, as my Google Maps and similar apps would work during my journey.
>
> — Toronto survey respondent

Data enhances the passenger experience and strengthens operations

Toronto's subway system carries significant passenger volumes every day, but with ridership mainly concentrated on two major lines, there is little 'slack' in the system. Unexpected delays due to medical emergencies or inclement weather can have cascading effects on all aspects of the transit system. This helps explain why, of all the global groups surveyed, Torontonians have the highest expectations for their transit network to be reliable (81%; global average 75%).

Most riders (92%) identified that they would be at least somewhat comfortable with receiving tailored alerts about problems or delays on their normal routes. A similarly strong majority (88%) indicated they would like to benefit from an 'evolved' transit network with connectivity, data and artificial intelligence (AI) providing a better commuting experience.

Not only is this important for riders, but it is becoming increasingly important for transport operators to have line of sight into real-time conditions on the ground. Access to data analytics can help optimize staffing and services, anticipate emerging demands and develop data-backed strategies for long-term growth and transformation. This data can also help municipal and transit officials better plan for city events, as evidenced by the network insights seen during the Toronto Raptors championship series.

It's clear that Toronto transit riders expect transport authorities to invest in these value-added services. BAI is well positioned to provide the connectivity and insights required for these types of applications.

When Torontonians were asked if they were somewhat comfortable receiving tailored alerts of issues/ delays in their normal route:

92%
said yes

When Torontonians were asked if they would like to benefit from an 'evolved' transit network:

88%
indicated yes

> **Q** Tell us how technology could improve your rail journey.
>
> **A** Being able to monitor your journey for any service-related problems.
> — Toronto survey respondent

When Torontonians were asked to what extent the following were of interest to them:

83%
said tailored and personalized commute information

83%
said systems to inform and assist disabled people with accessibility

79% 5G
said 5G networks and connectivity

> **Better connectivity would give me the ability to get more done both for my employment and personal life. I would get more free/ relaxed time at home to spend with my partner and child.**
>
> **— Toronto survey respondent**

Timely, personalized information is the key to an improved experience

Technology has many purposes, but improving human wellbeing is perhaps its most important. Modern network infrastructure, including sensors, data services and mobile device connectivity, can significantly enhance the passenger experience. Torontonians are eager to benefit from these services, with 83% of respondents expressing their willingness to receive tailored and personalized information about their journey. Such a network provides many other experience-enhancing benefits, including:

- the ability to monitor and manage passenger flows into and out of platforms and train services;
- more granular real-time information about service status, delays and possible alternative routes or connections; and
- the capacity for operators to more accurately forecast demand and adapt quickly to changing conditions.

Personalized information services based on relevant data flows would allow transit riders to plan their trips accordingly, opting for alternate routes or delayed travel based on current conditions.

As governments, businesses and public transport operators around the globe continue adapting to the COVID-19 pandemic, offering detailed, timely and timely services, based on near real-time data, is essential for rebuilding public trust and patronage.

The future is connected, data-driven and customer-focused

The 2020 Connectivity outlook report paints a clear picture of what global transit riders expect from their transport services. The Torontonians surveyed echoed the global findings but also revealed their unique preferences and concerns.

Rebuilding commuter trust hinges on using data-based services to provide timely and personalized information about service status, safety, traffic flows and more. With new technologies such as 5G and Wi-Fi 6, there has never been a better, or more important, time to invest in the smart network infrastructure that will take public transport services into the future.

Pervasive and seamless connectivity is a cornerstone of smart transit systems

Professor Amer Shalaby is an expert in urban public transport and heads the Transit Analytics Lab (TAL) of the University of Toronto Transportation Research Institute. Envisioned as a 'live' lab for Big Data transit analytics, TAL serves as a collaborative research forum with the aim of promoting data-driven decision-making and improvements to user experience.

Professor Shalaby is specialized in transit planning and operations, intelligent transportation systems, and transportation planning for large-scale events and mega cities.

BAI Communications invited him to examine and comment on the findings of our research report.

## Advanced network infrastructure is the key to smart cities

The 'Smart Cities' paradigm is predicated on a modern mobility system that connects residents and visitors with places they wish to visit in a rapid, reliable and safe manner. High quality and efficient public transit is undoubtedly the linchpin of smart mobility systems. While rigorous systems planning is required to deliver effective transit networks, modern technologies are key enablers to improve the management and customer experience of these networks.

Toronto has been reputed widely for its highly effective and efficient transit system, with its ridership levels and cost recovery ratio scoring among the highest in North America. Such outcomes have been credited not only to creative transit planning and design practises but also early adoption of sensor and communication technologies that improve the performance of the system. In recognition of its distinguished performance and innovation, Toronto's transit system was named in 2017 as the *"APTA Transit System of the Year"*.

However, Toronto's future as a world-class 'smart city' is highly dependent on its continued innovation and application of smart technology to its transit system, in order to meet the high expectations Torontonians have of their system. Pervasive and seamless connectivity is a cornerstone of smart transit systems, particularly in multimodal systems like Toronto's which rely heavily on its subway system (the 4-line subway network of Toronto serves roughly 50% of all transit trips in the city every day, while the 149 bus routes and 11 streetcar lines serve the other half).

Data-driven services make transport safer, smarter and more efficient

Transit users in Toronto spend so much time in the transit system, walking to and waiting at transit stops, riding buses or trains, and transferring between lines if needed. The transit journey is often marred with extra delays due to deviations from schedule and unplanned service disruptions which are not uncommon occurrences. Concerns about security and safety are also mounting, and so are health concerns due to transit overcrowding during the COVID-19 pandemic.
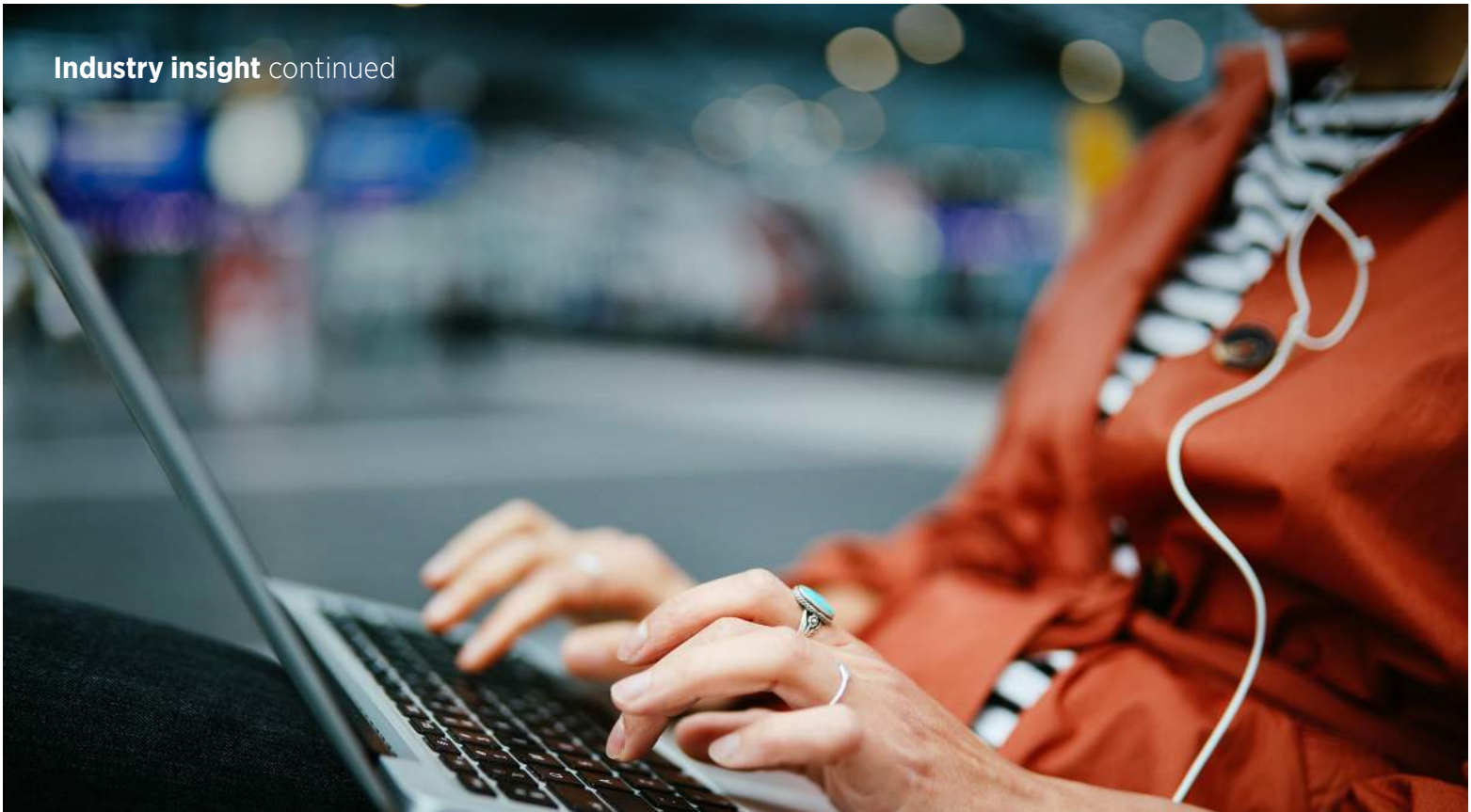
Data-driven services enabled by seamless connectivity can alleviate some of these issues. As many studies have shown, transit riders appreciate timely information on delays and alternative options, not only before starting their trips but also while en route. With many transit users in Toronto riding the subway followed by a bus or streetcar connection, using third-party apps to receive information about the status of their connections or signalling their intent to transfer to specific routes is another promising service that can be enabled by seamless connectivity in the subway system. At the COVID-19 pandemic times we currently witness and moving forward towards economic recovery, providing timely information on crowding levels at stations and individual cars of incoming trains is of utmost importance. Additional personalized services can be provided to rail transit users with the aid of connectivity, such as seat reservation, AR-based wayfinding in subway stations, to name a few.

Transit authorities and operators can exploit connectivity to improve system performance and resilience. Overcrowding on subway platforms and trains do not only degrade the system throughput and efficiency but can also pose security and health hazards. Demand and flow management of overcrowded subway systems to mitigate those risks can be greatly enhanced with data-driven services.

Connectivity gives citizens control of their time, their work and their wellbeing

With seamless and reliable connectivity across the transit system, transit riders can use their travelling time more productively. In a big metropolitan city like Toronto where many transit riders spend more than hour in each of their morning and evening commutes every day, using some of this time on productive tasks related to work or personal matters can be only empowering.

In a study on the work commute in the UK, it was found that commuters by car or train suffer worse stress than fighter pilots or riot police facing mobs of unruly demonstrators. Providing Toronto transit commuters with seamless connectivity and ancillary data-driven services that empower them with information on delays and disruptions, allow them to reserve tickets and seats, and enable them to use their times productively will indeed reduce the stress level of their commuting and improve their overall user experience and wellbeing.

To download the *2020 Connectivity outlook* report, click here.

This is the second benchmarking report on communications infrastructure in public transport conducted by BAI Communications. Read the 2019 findings here.

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