Improving operational efficiencies during COVID-19

Giving transit operators greater line of sight with Wi-Fi data

Passenger safety is at risk when subway platforms get too crowded. In 2019, BAI Communications (BAI) developed a solution with the Toronto Transit Commission (TTC) to monitor station occupancy using anonymized Wi-Fi association data. That technology found an unexpected new purpose with the outbreak of COVID-19, when large crowds suddenly became a public health issue. BAI adapted its solution to support physical distancing measures — giving TTC operators the information needed to make safer trip planning decisions.

Customizing solutions to optimize operations

As builder and operator of the TTC's TCONNECT Wi-Fi network, BAI helps keep passengers connected in Canada's largest transit system. In 2019, the team proposed a number of potential applications the TTC could deploy to get more value out of the wireless network and meet its ongoing smart transit goals. One in particular stood out: an analytics-backed solution to detect overcrowding at subway station platforms.

Overcrowding not only negatively affects the passenger experience, it can make subway platforms hazardous, creating bottlenecks at entrances and exits that make it difficult to safely evacuate in case of an emergency. While the TTC monitors its 75 subway stations with thousands of CCTV cameras, it's a very challenging task for a human team to watch them all in real-time and track station and platform conditions. The team proposed a customized solution for seamless, automated crowd management based on data extracted from the TCONNECT Wi-Fi network. This allows operators to take a proactive approach, addressing conditions before they become unmanageable.

Analytics that reveal real-world conditions more clearly

BAI built the overcrowding detection solution for the TTC using a custom algorithm that calculates crowd sizes based on the number of devices associated to the TCONNECT Wi-Fi network, at any given station. The solution identifies changes in station occupancy in near real-time, spotting trends that could indicate overcrowding well before those conditions materialize.

The team worked with the TTC to assign a unique overcrowding threshold for each station based on platform size, number of entrances/exits and other parameters. BAI also developed custom application programming interfaces (APIs) to ensure the data and analytics would integrate seamlessly with the TTC's existing business intelligence platform.
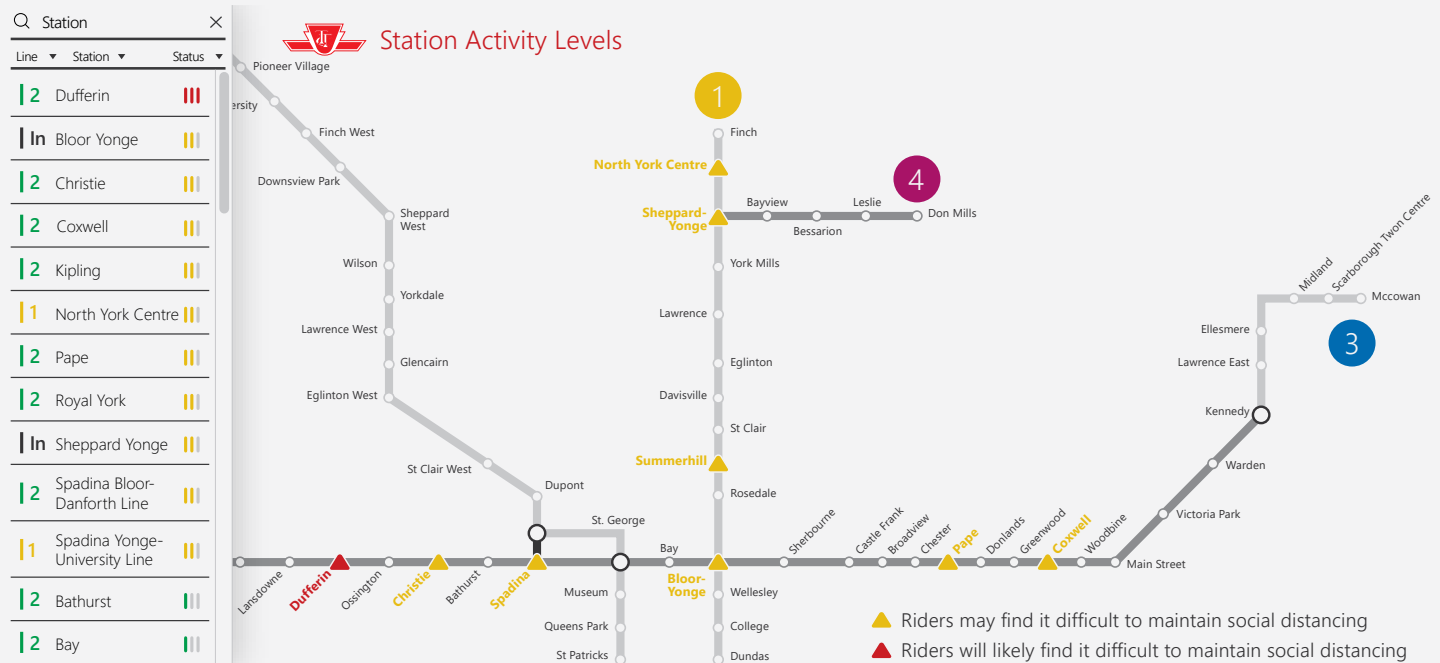
Leveraging agile development processes, the design, implementation and demonstration of the solution was completed in a matter of weeks. The solution was built in the cloud and leveraged existing network infrastructure, which meant no new equipment needed to be installed and BAI was able to quickly meet the TTC's needs.

Pivoting to respond to the pandemic

In the wake of COVID-19, the TTC asked if BAI would adapt the solution to allow the TTC to reinforce physical distancing measures. By setting lower overcrowding thresholds for all stations based on COVID-19 guidelines, BAI built a simple, easy-to-use online dashboard that allowed the TTC to review station occupancy data in near real-time. With this information, operators have the ability to make informed choices about service scheduling to help facilitate social distancing throughout the subway system. The dashboard marks each station in one of three colours: grey, yellow or red to indicate how difficult it will be to maintain physical distancing on the platform.

The dashboard provides an at-a-glance view of station occupancy volumes throughout the TTC system.

△ Riders may find it difficult to maintain social distancing
▲ Riders will likely find it difficult to maintain social distancing

Data is the solution

These kinds of analytics-based solutions allow transit authorities to extract more value out of their wireless networks — an important addition to their digital toolkit for protecting rider health and safety in the current pandemic context and once things get back normal. There has been no better time to invest in these smart technologies.

By partnering with BAI Communications, transit authorities can become the catalyst for creating connected cities; enabling connectivity and economic growth through the provision of a high-capacity, high-availability, multi-use communications network.

How can our transit network Wi-Fi data support your business goals? **Connect with us to find out.**

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