For Action

Cost-Benefit Analysis of a Pilot for Free Wi-Fi Service on Bus and Streetcar Platforms

Date: February 24, 2025
To: TTC Board
From: Chief Strategy and Customer Experience Officer

Summary

As requested by the Board at its meeting on September 24, 2024, Staff conducted a cost-benefit analysis of a pilot project to provide free public Wi-Fi service on bus and streetcar platforms. To inform this analysis, a Request for Information (RFI) was issued to the market in November 2024 to refine cost estimates and gauge market interest.

The benefits of offering public Wi-Fi on bus and streetcar platforms include providing another means to access real-time service-related information while travelling on the TTC, as well as more generally providing internet access to customers while they are waiting at bus and streetcar platforms. However, recent experience has clearly shown that TTC customers prefer to use faster and more readily available (i.e. no log in required) cellular services, which have also become more affordable over the past several years. This has been illustrated by the rapidly declining use of TTC free public Wi-Fi in subway stations once 5G service became available prior to the end of that service in December 2024, and the limited uptake of Wi-Fi when offered on select surface bus routes over the past several years. As a result, the combination of City of Toronto programs, such as ConnectTO where free public Wi-Fi is available in libraries, community centres, and other civic locations, and more affordable wireless plans is increasingly providing Torontonians with free or lower cost internet access.

All bus and streetcar platforms or waiting areas at subway stations are equipped with real-time information screens displaying next vehicle arrivals and service disruptions. While customers can use internet services, where available, for personal safety such as SafeTTC app reporting, bus and streetcar platforms are also equipped with various features that promote customer safety without requiring Wi-Fi connectivity. Enhanced lighting and camera coverage provide visibility and continuous monitoring. Passenger Assistance Intercoms are located in Designated Waiting Areas (DWA) on subway station platforms, at all elevator lobbies and all fare lines. These intercoms connect to TTC staff, who can arrange emergency response. Public telephones are available on all subway station platforms, station entrances, and bus and streetcar transfer areas. Additionally, customers can report safety concerns via free text messaging, which does not rely on Wi-Fi and all customers can reach 911 using any phone, regardless of data availability or cell plan.

A pilot project would cost approximately $59,000 per station in capital investment to deploy Wi-Fi infrastructure and approximately $70,500 per station in annual operating costs, which includes the cost to provide data, content filtering, and staff support. There is no funding available in the TTC's 2025 Operating and 2025-2034 Capital Budget and Plan to implement this initiative.

The TTC does not recommend moving forward with a stand-alone Wi-Fi pilot as, while this is technically feasible, historical Wi-Fi usage does not demonstrate a significant portion of TTC transit users are benefitting from this service, and a pilot could cause customer confusion if Wi-Fi is available at certain stations and not others.

To avoid customer confusion and ensure equitable access, if Wi-Fi were to be implemented, the recommendation would be to implement Wi-Fi system-wide at all off-street bus and streetcar platforms. If a decision were made to implement Wi-Fi at these locations, it is estimated to require approximately $2.8 million in initial capital investment across 47 bus and streetcar platforms and $3.3 million in annual operating costs. This funding would have to be re-allocated from other priority initiatives.

Given the required capital and ongoing operating costs to implement this initiative, limited benefits, and available alternatives for customers, it is recommended that the TTC not pursue implementation of Wi-Fi services on bus and streetcar platforms. Any new funding streams should instead be invested in priority initiatives already identified in the TTC's strategic plans, including the TTC Corporate Plan 2024-2028 and the 2024-2028 5-Year Service and Customer Experience Action Plan (5YSP). That said, it is recommended that TTC forward the information and analysis in this report to the City of Toronto for consideration as part of their ConnectTO program, should dedicated City funding for Wi-Fi implementation become available, noting that there is no existing or planned collaboration with ConnectTO as part of their approved workplan or funding.

Recommendations

It is recommended that the TTC Board:

1. Forward this report to the City of Toronto for future consideration as part of their ConnectTO program.

2. Direct staff to prioritize alternative strategies for improving customer information, safety, and accessibility, as detailed in the TTC Corporate Plan and 5-Year Service and Customer Experience Action Plan.

Financial Summary

Installing the necessary infrastructure to provide free public Wi-Fi service at TTC's 47 off-street bus and streetcar platforms at subway and LRT stations (including 4 stations on Line 5) is estimated to require an initial capital investment of approximately $59,000 per station, with annual operating costs of approximately $70,500 per station (which includes the cost to provide data, content filtering, and staff support), or approximately $2.8 million in initial capital investment and $3.3 million in annual operating costs.

Funding to provide free public Wi-Fi service is not included in the 2025 Operating Budget or the 2025-2034 Capital Budget and Plan, which was approved by the Board at its meeting on January 10, 2025, and by City Council on February 11, 2025.

The Executive Director, Finance has reviewed this report and agrees with the financial impact information.

Equity/Accessibility Matters

It is important for the TTC to analyze the social benefits of a Free Wi-Fi Pilot at off-street bus and streetcar platforms, as well as to consider the social costs associated with not moving forward with a Pilot program. This consideration can be contextualized within Strategic Direction 2 of the TTC's Corporate Plan: 2024-2028 & Beyond, which places the customer at the centre of decision-making. This equity analysis presents relevant information to consider ways to establish a balance between customers' needs and the provision of reliable transportation services to customers.

Several research reports have alerted government organizations about the digital divide that exists across Canada, and in the city of Toronto, in an increasingly digital world. Specifically, Toronto's digital divide "disproportionately disadvantages low-income households, recent immigrants, single parents, seniors, people experiencing housing precarity, and many racialized groups." Although approximately 98% of Torontonians state that they have internet access at home, 38% of households report having download speeds "below the Canadian Radio-television and Telecommunications Commission's (CRTC) national target of 50 megabits per second (Mbps)." Additionally, the impacts of barriers to digital connectivity can have profound consequences on equity-deserving groups, including lost job opportunities and income.

Lack of access to internet services at home also impacts a household's ability to access critical services, including government services and information, banking, health care, education, and work. Beyond home internet access, Toronto residents also rely on cellular data depending on if they can afford the costs.

The City of Toronto recognizes that having dependable, affordable access to the Internet is essential, as demonstrated through data and public feedback. Public Wi-Fi is offered in many locations throughout the City free of charge and continues to increase as the City invests in modernizing facilities and ensuring residents have access to reliable internet through ConnectTO program. Service is currently offered at over 130 community centres, St. Lawrence Market, and common areas of select community housing buildings in addition to 100 Toronto Public Library branches.

On public transit, free public Wi-Fi could provide additional value by enhancing the customer experience, enabling customers, including those affected by the digital divide, to use navigation tools, access real-time information, access critical services, and communicate during their commutes. This is particularly important to transit-dependent riders with limited or no cellular data plans.

When evaluating the broader impacts of free public Wi-Fi from a digital equity perspective, it is important to recognize that only a small percentage of customers actively relied on TTC-provided Wi-Fi when it was available. In addition to free public internet access, barriers to access cellular data plans have been reduced over the past three years. In 2021, the Federal government committed to working with the three major wireless providers, which represent 90% of the market share, to reduce the prices of wireless plans by 25%. The results of this commitment have been shown through a survey conducted by the Canadian Telecommunications Association (CTA) that was published in June 2024. The survey found that 60% of Canadians who switched cellular plans during the previous 12 months reported paying less for their new plan, with 86% of respondents stating that they are getting better value. As a result, the combination of city programs and more affordable wireless plans is increasingly providing Torontonians with free or lower cost internet access.

While free public Wi-Fi at off-street bus and streetcar platforms could benefit some equity-deserving customers and those without Canadian cellular plans (i.e. visitors to Toronto), its slower speeds and limited range within stations may deter regular use. Moreover, riders without internet-enabled devices would not benefit at all, meaning the service would fail to reach some of the most disadvantaged TTC customers.

Forgoing Wi-Fi implementation could enable the TTC to invest new resources that become available towards initiatives that provide more equitable impacts, such as improving fare affordability, service improvements, staffing and safety improvements, or other customer experience enhancements. Considering many customers already have data plans or access free public Wi-Fi at libraries, community centers and at other locations such as coffee shops and restaurants, the absence of Wi-Fi at TTC stations is unlikely to impact most customers. Instead, investments in improved service could directly address mobility barriers for marginalized communities. Fare equity programs such as fare capping or deepening the fare discount for Fair Pass customers would provide direct financial relief and greater access to essential services, employment, and education. Enhancing the availability of real-time service information on fixed displays would ensure that all customers, including those without smartphones, have access to accurate and timely TTC updates. These alternative investments would enable the TTC to deliver improvements that benefit riders, including equity-deserving customers.

Decision History

November 21, 2012: Wireless Network in the Subway System. In December of 2012, the TTC entered into a contractual arrangement with BAI Communications (BAI) to develop a wireless network within the subway system. Report: Wireless Network in the Subway System. Decision: TTC Board Decision.

July 14, 2020: Providing Free Wi-Fi Access to TTC's Surface (Bus & Streetcar) Routes. The TTC Board adopted a motion mandating TTC staff to develop a plan to implement a pilot program to explore free Wi-Fi on the surface network encompassing buses and streetcars servicing all 31 Neighbourhood Improvement Areas and Higher Education Institutions, with the potential to expand to all surface routes contingent upon the success of the pilot program. Report: Providing Free Wi-Fi Access to TTC's Surface (Bus & Streetcar) Routes. Decision: TTC Board Decision.

May 8, 2023: Chief Executive Officer's Report – May 2023. The TTC Board was advised that Rogers Communications purchased BAI Communications' Canadian operations. On April 24, 2023, the TTC finalized amendments to its contract with Rogers, which included a 10-year extension. Report: Chief Executive Officer's Report - May 2023

September 24, 2024: Continuing Free Wi-Fi Service. The Board asked staff to conduct a cost-benefit analysis of a pilot for free Wi-Fi on bus and streetcar platforms and bays at stations given that public Wi-Fi is both a safety and accessibility issue. Motion: Continuing Free Wi-Fi Service. Decision: TTC Board Decision.

Issue Background

In 2017, Toronto City Council ("City Council") identified accessible internet connectivity as a priority for fostering economic development and addressing social inequities through digital inclusion. This recognition prompted a recommendation to harness existing City of Toronto (the "City") assets to enhance internet speed, coverage, and capacity. Subsequently, the City's Poverty Reduction Strategy in 2020 underscored the importance of Wi-Fi access to support low-income residents and streamline social support programs. This led to the inception of the ConnectTO program, aimed at leveraging City assets like fiber, buildings, and right of way to provide affordable high-speed internet, aligning with the City's commitment to digital equity.

With 24 out of Toronto's 31 Neighbourhood Improvement Areas (NIAs) relying predominantly on the bus and streetcar network, the directive to expand Wi-Fi availability on city-owned assets became particularly relevant to the TTC. Given the City Council's vision and direction, it became logical for the TTC to explore utilizing its vehicle and station assets as conduits for delivering free and continuous Wi-Fi connectivity.

Current State of Connectivity

Subway Wireless Network and TConnect Wi-Fi

In December 2012, the TTC entered into a 20-year agreement with BAI Communications Inc.'s Canadian operations (BAI Canada) to develop a wireless network within the subway system. BAI Canada launched the TConnect Wi-Fi service in December 2013, providing connectivity in underground areas of stations. The TConnect Wi-Fi service, which was managed by BAI Canada and funded through advertising, was not a contractual requirement.

In April 2023, Rogers acquired BAI Canada, including its wireless infrastructure in the subway system and contract with the TTC. As part of the acquisition, Rogers has committed to a multi-year investment to upgrade the existing infrastructure and build out a new 5G wireless network across the subway system. By the end of 2023, 5G cellular service was made available to all major carriers at all subway stations, and in tunnels in the downtown core and between Sheppard West and Vaughan Metropolitan Centre stations.

As the 5G service becomes available within the TTC's subway network, customers are increasingly relying on it for their connectivity needs. Concurrently, the TConnect Wi-Fi service saw a significant decline in usage as the 5G rollout advanced. The infrastructure supporting the TConnect Wi-Fi service has reached its end of life, is outdated, and any security vulnerabilities would not be addressed by the hardware vendor. The TTC and Rogers evaluated options to either optimize the existing system for the short-term or replace it with more modern technology. However, due to the declining usage, security risks associated with the current system, and the high costs of upgrading the infrastructure to meet modern standards, the decision was made to decommission the TConnect Wi-Fi service, effective December 27, 2024.

Surface Network Wi-Fi Pilot

In July 2020, the Board directed TTC staff to report back with a plan to implement a pilot program to explore free Wi-Fi on the surface network, encompassing buses and streetcars servicing NIAs and higher education institutions, with the potential to expand to all surface routes contingent upon the success of the pilot program.

Between 2021 and 2023, the TTC conducted a two-phase pilot on 181 buses, covering six routes that served 23 NIAs and six higher education institutions. The pilot evaluated the technical feasibility, operational implications, and user experience of the service, comparing TTC-supported and fully vendor-managed operating models. The pilot project has now been completed as of April 2023 and the Wi-Fi equipped buses will soon be withdrawn from service as they have reached retirement age. Details of the pilot and lessons learned are included in Attachment 1.

ConnectTO: Free Public Wi-Fi Availability

Public Wi-Fi is offered in over 130 community centres, St. Lawrence Market, common areas of select community housing buildings, and 100 Toronto Public Library branches free of charge through the City's ConnectTO program. The number of locations continues to increase as the City further invests to provide free internet access at publicly accessible facilities.

Sites have been selected based on neighbourhoods that stand to benefit the most and research engagements with Canadian universities. Locations are prioritized based on the following criteria:

- Free centres, where programs are available at no cost
- Neighbourhood Improvement Areas and Emerging Neighbourhoods
- Centres with Enhanced Youth Spaces
- Cultural hubs and areas with high utilization
- Geographic spread for Citywide representation

Further information is available on the ConnectTO website.

Toronto Public Library

In addition to providing Wi-Fi access at all 100 branches, Toronto Public Library also offers a Wi-Fi hotspot lending service at 34 of its branches. Wi-Fi hotspots are provided on a first-come, first-served basis, and each device is equipped with an unlimited data supply, which includes max LTE speed with usage beyond set to 5 megabits per second. Participants can keep the hotspots for up to six months. The purpose of this service is to bridge the digital divide for individuals who do not have home internet access.

Board Request to Review a Bus and Streetcar Platform Wi-Fi Pilot

In September 2024, in response to the decommissioning of TConnect Wi-Fi service, the Board requested that staff report back with a cost-benefit analysis of a pilot for free public Wi-Fi at bus and streetcar platforms and bays at stations. This report provides a cost-benefit analysis of a potential Wi-Fi rollout for bus and streetcar platforms, presenting findings, potential benefits, and associated operating and capital costs for full-scale implementation.

Comments

Industry Scan – Free Public Internet as an Amenity on Public Transit

A jurisdictional scan of major Canadian and American transit agencies shows that most agencies with rapid transit networks offer cellular access in stations and tunnels while Wi-Fi access offerings are mixed.

Canadian cities tend to offer cellular service through their entire rapid transit networks, such as Société de transport de Montréal (STM), TransLink (Vancouver), and Calgary Transit. STM does not offer Wi-Fi, while Calgary Transit has Wi-Fi with capped bandwidth for light usage. Translink, on the other hand, has only rolled out Wi-Fi at two stations.

In the United States, New York's Metropolitan Transit Authority (MTA) which had offered free public Wi-Fi services on approximately 75% its bus fleet since 2016, announced the discontinuation of this service in 2023, citing high cost and low adoption. MTA plans instead to invest in expanding to full subway network cellular service over the next ten years. It is also worth noting that the wireless service provider market is larger and more competitive in the US, and rates for data are typically lower for US customers than for Canadian customers.

The industry scan also revealed that many agencies' Wi-Fi and cellular infrastructure and access points are funded by the telecom companies themselves. For example, TransLink's model is cost neutral and achieved through a partnership with Shaw Communications Inc. (acquired by Rogers Communications Inc. in 2023), Ottawa's infrastructure was installed and made available by Telus Communications, Edmonton's Wi-Fi access points were funded by the municipal government and Eduroam, while MTA New York City's infrastructure is being funded and installed by Transit Wireless,

owned by BAI Communications. The TTC is in the minority of agencies where internet amenities were not paid for by an external funding source.

Further information is available in Attachment 2 below.

Market Research – Wi-Fi at Major Bus and Streetcar Platforms

Alongside an internal implementation cost study, the TTC conducted market research to explore third-party options and cost structures for providing free public Wi-Fi at off-street bus and streetcar terminals at subway stations. The research focused on gathering critical information, including:

- **Service Options:** Identifying network service providers capable of delivering reliable, high-speed, and secure public Wi-Fi at major bus and streetcar platforms and transit hubs.
- **Cost Structure:** Understanding the initial setup costs (equipment, installation), ongoing operational expenses (bandwidth, maintenance), and scalability options.
- **User Experience:** Evaluating the impact on customer satisfaction, the number of expected users, and potential features like customized splash pages or limited-access Wi-Fi.
- **Benchmark Analysis:** Reviewing Wi-Fi services offered by other public transit agencies and transportation hubs to benchmark against industry standards.

This research aimed to provide a data-driven understanding of the feasibility, technical requirements, and financial implications of implementing such a service, enabling informed decision-making. Furthermore, an equity analysis was undertaken by TTC's Diversity Department. To facilitate this research, a Request for Information was issued on November 11, 2024, and closed on December 11, 2024. Two responses were received from the industry and are summarized below.

1. **Service Models**
   The RFI responses indicated that various flexible and secure service models were available with cost to the service provider, paid by customers or hybrid Wi-Fi options, as well as potential cost sharing partnerships with mobile carriers.

2. **Revenue Generation**
   The RFI responses noted that advertising on landing pages could be explored but has not been highly successful in generating revenue as advertising does not typically generate enough revenue to sustain the cost of infrastructure. Collaborations, partnerships and co-marketing could also be explored, as well as anonymous data monetization and premium or tiered services.

3. **Cost Structure**
   Both responses to the RFI offered flexible pricing options for the TTC's Wi-Fi system but took different approaches. The first response had costs that varied widely based on the scope of service and location. The second response provided a simpler pricing model with clear upfront costs per square foot and detailed ongoing expenses.

4. **Implementation and Support**
   The RFI responses proposed end-to-end managed services including design, deployment and support. Network performance and usage would be managed through cloud-based services. 24/7 technical support would be available including proactive monitoring and on-site support as needed.

Cost-Benefit Analysis of a Bus and Streetcar Platform Wi-Fi Pilot

Funding is not included for a pilot of free Wi-Fi in the approved 2025 TTC Operating or 2025-2034 Capital Budget and Plan. Any funding for a pilot would need to be re-allocated from other priority initiatives. Were a pilot to be offered, it could make free Wi-Fi available to TTC customers connecting to bus and streetcar routes at select off-street bus/streetcar terminals at subway stations. A potential approach could be to offer this service at 10 off-street terminals that best meet selection criteria that could include ridership, proximity to and connections to NIAs, connections to regional transit partners, and geographic accessibility, which would allow for this service to benefit the maximum number of customers, including equity-deserving groups, during a limited pilot rollout.

This pilot would involve installing public Wi-Fi infrastructure at designated subway station bus and streetcar terminals and would require clear communication to customers regarding which locations have Wi-Fi access in order to avoid customer confusion. Additionally, the utility of this service would be limited for customers who use other stations that are not one of the 10 selected locations, including equity-deserving customers who use stations and routes across the system.

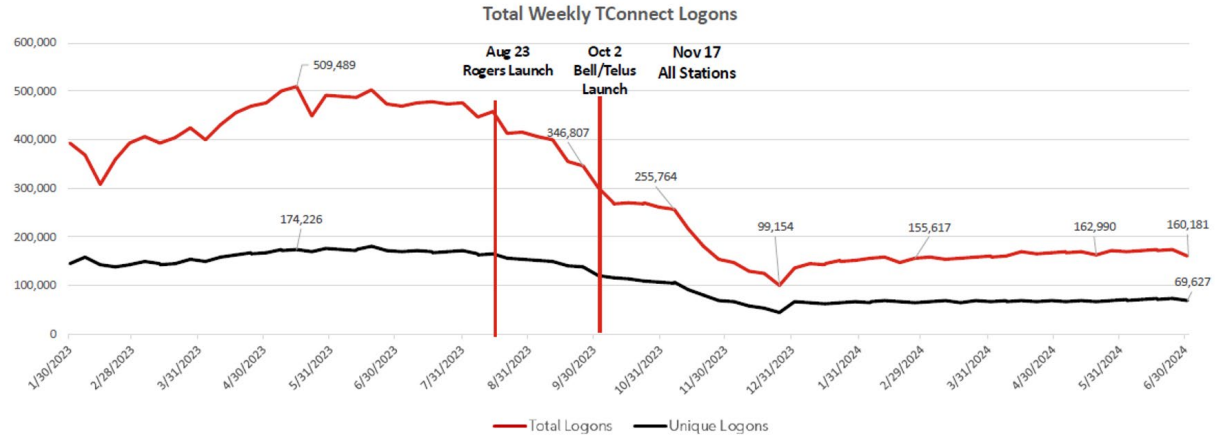
That said, the Surface Network Pilot and previous TConnect subway Wi-Fi network have already proven that the TTC is able to deliver Wi-Fi in stations and on vehicles, meaning that another pilot is not necessary. Should a decision be made to again offer free public Wi-Fi, a system-wide implementation would be the recommended approach. Providing Wi-Fi system-wide would address concerns and ensure equity by allowing customers to access the service throughout the network and eliminate confusion about where it is available. A pilot offering Wi-Fi at only 10 bus and streetcar platforms is unlikely to meet these goals. Partial implementation creates geographic inequities, benefiting riders of select stations while leaving others without access. Without system-wide implementation, a limited pilot could exacerbate perceptions of inequity and inconsistency, undermining the goal of providing equitable access to TTC services for all customers.

Given the limitations of a selective Wi-Fi pilot, an approach that ensures consistency is preferable. Implementing Wi-Fi at all off-street bus and streetcar platforms would provide more equitable access but would come at significantly higher costs. Of the three million bus and streetcar boardings and alightings on an average weekday in Fall 2024, 2.4 million, or 80%, do not occur at off-street bus and streetcar platforms, limiting the reach and benefit of platform-specific Wi-Fi services. These considerations highlight the need to carefully evaluate whether a system-wide rollout aligns with broader priorities for equitable use of limited transit resources.

Conversely, the TTC can choose not to provide Wi-Fi at bus and streetcar platforms – or system-wide – due to the low usage identified in the Surface Network Wi-Fi Pilot

(Attachment 1) and the observed decline in Wi-Fi usage in subway stations during 2024, post 5G cell service rollout (Figure 1). The expansion of Wi-Fi to pilot bus routes was not observed to significantly increase ridership or customer satisfaction. Similarly, implementing Wi-Fi at all bus terminals may not provide substantial benefits. Customers already have access to cellular service at these locations, which many prefer over Wi-Fi.

Figure 1: Decline in Weekly TConnect Usage, 2023-2024



As noted above, the City of Toronto has been expanding the availability of free public Wi-Fi across the city through the ConnectTO program. Free Wi-Fi at these locations allows people to comfortably stay for extended periods of time to work or study. It is acknowledged that some TTC customers have expressed a desire for Wi-Fi access on TTC vehicles and in TTC facilities to access service and other information during their travel. Given the nature of bus and streetcar platforms, where customers are waiting for TTC surface routes that are mostly scheduled to run every 30 minutes or better, are not climate controlled, and have limited seating capacity and space, it may be difficult for customers to fully utilize the free Wi-Fi that is available.

All bus and streetcar platforms or waiting areas at subway stations are equipped with real-time information screens displaying next vehicle arrivals and service disruptions, further limiting the added value of providing Wi-Fi in these areas. Although offering free Wi-Fi at stations or bus terminals would enhance convenience for some customers, the investment required would yield greater impact if directed toward priority initiatives identified in the 2024-2028 5-Year Service and Customer Experience Action Plan (5YSP) and the TTC Corporate Plan 2024-2028. The initiatives in these plans not only align with TTC's mission of providing a safe, reliable, efficient and accessible public transit service, but also would deliver greater value to a broader range of customers.

Opportunity Cost Analysis

This analysis evaluates the financial implications of implementing free public Wi-Fi service at off-street bus and streetcar platforms, considering its potential benefits and the number of customers who would benefit compared to alternative uses of the funds. Offering free Wi-Fi involves significant costs, including installation, maintenance, and customer support. Installing the necessary infrastructure for a 10-station pilot project, would cost approximately 590,000 in initial capital investment with annual operating

costs of approximately $705,000. To equip all 47 off-street bus and streetcar platforms at subway and LRT stations (including four stations with bus platforms on Line 5) with Wi-Fi infrastructure would cost approximately $2.8 million in initial capital investment and $3.3 million in annual operating costs. As previously mentioned, funding is not available for a pilot or wider rollout of free public Wi-Fi in the approved 2025 TTC Operating or Capital budgets. Any funding for a pilot or wider rollout would need to be re-allocated from other priority initiatives or would require a new funding stream.

Free public Wi-Fi at off-street bus and streetcar platforms offers several potential benefits. It improves accessibility by providing internet access to customers who may lack mobile data or sufficient data plans, addressing digital inequities. It also enhances the customer experience, allowing riders to use navigation tools, stay connected, and communicate while waiting for their bus or streetcar. Additionally, free public Wi-Fi would enable the TTC to collect data on usage patterns, offering insights that could inform operational decisions and service improvements.

However, these benefits come with significant limitations. The number of customers who would benefit is relatively small, limited to those who spend extended time at off-street bus and streetcar platforms and own internet-enabled devices. Based on observed, declining usage, from the previous TConnect Wi-Fi network offered in subway stations, it is estimated that the introduction of free public Wi-Fi on bus and streetcar platforms would benefit approximately 1% of customers who use these stations. Security risks inherent to all public Wi-Fi networks and service performance issues are also challenges that must be considered. These factors raise concerns about whether free public Wi-Fi is a cost-effective solution compared to alternative investments in transit improvements.

Investing instead in the initiatives outlined in the 2024-2028 5-Year Service and Customer Experience Action Plan (5YSP) and the TTC Corporate Plan 2024-2028 could deliver broader and more impactful benefits. For example, instead of funding Wi-Fi at bus and streetcar terminals, if new funding were made available it could be directed toward running additional bus service to better connect riders to locations that already offer free public Wi-Fi service, such as libraries and community centers. This approach aligns with action 2.6 of the 5YSP which aims to restore transit service levels back to Board-approved Service Standards and would particularly benefit low-income riders who rely on the surface network for essential trips.

With $3.3 million annually, the TTC could provide an additional 500 weekly hours of service. This is approximately equivalent to the cost of operating an all-day every-day bus route (e.g., 9 Bellamy, with 11,950 boardings per day). Similarly, the 2025 Operating Budget contains new investments of similar size, such as $2.6 million to fund 69 new positions to support the Fare Compliance Strategy and $3.2 million to improve midday, evening and weekend bus service on major routes throughout the City. These types of investments in service would result in service improvements for customers across the City, particularly those in NIAs.

At the annual cost of providing free Wi-Fi at off-street bus and streetcar platforms the TTC could install approximately 200 digital information displays annually across the network. These displays would provide real-time updates on bus arrival times, service

disruptions, and other critical transit information. This alternative would directly benefit all customers, including those without internet-enabled devices, ensuring equitable access to essential trip planning tools. Digital displays enhance the customer experience by reducing uncertainty and improving confidence in service reliability, which are key customer priorities. Furthermore, these displays would require lower ongoing maintenance and costs compared to public Wi-Fi, while delivering a broader impact by supporting informed decision-making for riders across the entire network.

There are also strategic fare initiatives which may include items previously discussed in the 5-Year Fare Policy and other options made possible with PRESTO 2.0, which could offer other high-impact alternatives. These initiatives would ensure equity and access, choice and flexibility, and affordability while modernizing TTC's fare collection system and fare media offerings.

Implementing free Wi-Fi at off-street bus and streetcar platforms would provide modest benefits to a limited subset of riders, likely benefitting only 1% of unique daily subway riders. In contrast, restoring off-peak service levels across the City, implementing 5-Year Fare Policy initiatives, or enhancing real-time information would deliver meaningful improvements to a much larger segment of TTC riders. These alternatives align more closely with strategic priorities, making them a more effective and equitable use of limited transit resources.

Recommendations

TTC will continue its partnership with Rogers Canada to expand 5G cellular services across the subway network, making internet and cellular services available to customers of all Canadian wireless carriers. However, after an options analysis balancing benefits and opportunities against cost and risk, staff do not recommend proceeding with either a pilot or full rollout of free public Wi-Fi on bus and streetcar platforms at subway stations given the limited benefits of providing this amenity. These recommendations are based on several key factors that collectively indicate that the benefits of implementing free public Wi-Fi do not align with the substantial capital investment and ongoing operating costs that would be required. That said, it is recommended that TTC forward the information and analysis in this report to the City of Toronto for consideration as part of their ConnectTO program, should dedicated City funding for Wi-Fi implementation become available, noting that there is no existing or planned collaboration with ConnectTO as part of their approved workplan and funding.

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Attachments

Attachment 1 – Surface Network Free Public Wi-Fi Pilot Overview and Cost Benefit Analysis

Attachment 2 – Industry Scan – Public Internet Services in Public Transportation

Attachment 1 - Surface Network Free Public Wi-Fi Pilot Overview and Cost-Benefit Analysis

Background

At its meeting on July 14, 2020, the Board directed the TTC to report back with a plan to pilot free public Wi-Fi on the surface network. The pilot ran between May 1, 2021 and April 11, 2023, on four cross-city bus routes. An overview is provided below.

In 2020, the TTC's connected customer experience landscape was quite different from today. Most TTC customers could not use their mobile devices on subway trains where cellular service was only available to Freedom Mobile customers. In the intervening period, the TTC connected customer experience has transformed and continues to evolve. Customers with cellular plans now have access to 5G service in all TTC stations while tunnel coverage continues to expand in partnership with Rogers. In addition, all customers now have 9-1-1 access across areas of the subway network with cellular service provided they have a cell phone, regardless of whether they have a data plan.

Through the free public Wi-Fi on bus pilot, the TTC demonstrated that it is technically feasible to offer customers access to free on board bus Wi-Fi. This is not surprising given that on board Wi-Fi is a proven technology. However, despite being widely marketed, the pilot found that over 90% of customers did not take advantage of this free amenity. Of customers who did use it, 71 percent reported being satisfied with the service and likely to use it again.

The TTC had hoped to identify a cost-neutral or cost-reduced operating model to deliver free public Wi-Fi on the surface network; however, none was identified. Although a precedent exists with TransLink achieving this in Vancouver, the conditions surrounding that case, particularly the involvement of Shaw seeking to expand its market share, may not be replicable in the same manner in the Toronto context. The technical potential to deliver the pilot as an ad supported service was demonstrated, however the pilot did not generate revenue, and the low adoption rate may limit attractiveness to potential advertising partners due to the perceived low revenue potential.

Strategic Case

A limited strategic case for surface network-wide implementation exists and would extend the opportunity for a small percentage of TTC bus, streetcar, and Wheel Trans customers who are in possession of a mobile device but who are without a data plan, or with a limited data plan, to use free Wi-Fi during the surface network portion of their trip.

Surface network customers who are already in possession of a data plan are unlikely to benefit from a free Wi-Fi amenity as their data costs are already sunk. Customers only travelling on Lines 1, 2, and 4 will also not benefit from a free Wi-Fi amenity limited to the surface network.

Deliverability and Sustainment

Deliverability and sustainment of on-board Wi-Fi requires design, testing, installation, and maintenance of Wi-Fi infrastructure on revenue service surface vehicles. This brings unique challenges. One results from the lifecycle limits of the fleet assets themselves. Between 2026 and 2030, the TTC plans to retire 755 diesel buses, and to procure 875 eBuses, subject to available funding, with the goal of reaching a fully electric fleet by 2040 in alignment with the City's TransformTO Net Zero Strategy. Also, due to differences between the design and configuration of various fleet modes and models, each vehicle model will require a unique engineered design, and may require unique parts, standard operating procedures and tools. This will foreseeably introduce complexity into the TTC's vehicle engineering, fleet management and maintenance practices.

To mitigate the challenges of installing and maintaining infrastructure on fleet, along with the estimated implementation and sustainment costs and the relatively low uptake by customers, staff were asked to evaluate options to make Wi-Fi available to surface network customers within public areas in fixed infrastructure (e.g. stations) where customers are likely to be waiting to board surface vehicles, discussed in the body of this report.

Implementation Estimate

Implementing free public Wi-Fi on all surface network vehicles (bus, Wheel-Trans, and streetcar) through a fully vendor managed solution would require an estimated capital investment of $20 million (class 5) and an annual operating cost of $7.4 million (class 5).

Free Bus Wi-Fi Pilot Overview

During the pilot, 181 buses were enabled with free Wi-Fi available for customer use. The pilot ran between May 1, 2021, and April 11, 2023, on six bus routes serving 23 NIAs and six post-secondary institutions.

Route Selection

Figure 1: In Scope Bus Routes Free Wi-Fi on Bus Pilot

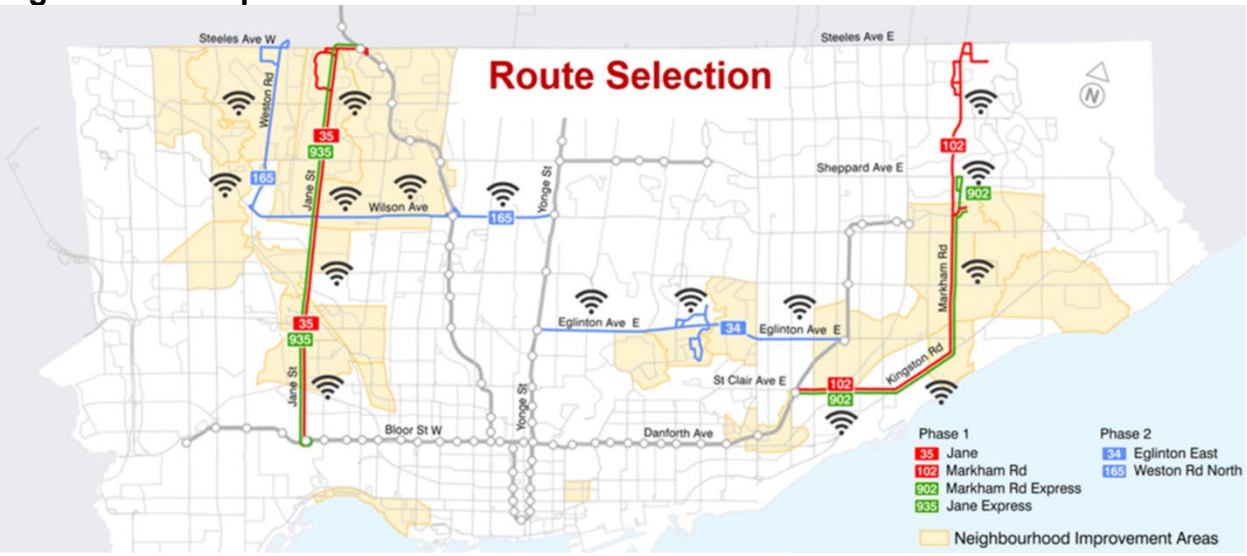


Table 1: Free Public Wi-Fi on Bus Pilot In-Scope Routes

Pilot Bus Route	Avg. Weekly Ridership Fall 2022	Subway Network Interchanges	NIAs Served	Post-Secondary Institutions Served
34 Eglinton East	113,300	• Line 1 Eglinton Station • Lines 2 & 3 Kennedy Station	• Thorncliffe Park • Flemingdon Park • Victoria Village • Rockcliffe-Smythe • Kennedy Park • Eglinton East	• Academy of Learning College • Don Mills Career College
165 Weston Road North	120,800	• Line 1 York Mills Station • Line 1 Wilson Station	• Downsview • Oakdale-Beverley Heights • Humbermede • Humber Summit	• None
35 / 935 Jane	153,000 66,600	• Line 1 Pioneer Village Station • Line 2 Jane Station	• York University Heights • Black Creek • Glenfield-Jane Heights • Oakdale-Beverley Heights • Rustic • Weston • Mount Dennis • Rockcliffe-Smythe	• York University • Niagara University in Ontario
102 / 902 Markham Road	129,800	• Line 2 Warden Station	• Oakridge • Kennedy Park • Scarborough Village • Golfdale-Cedarbrae-Woburn • Woburn North	• Centennial College, Progress Campus • Stanford International College

Marketing

The pilot was communicated through multiple channels, including via news and social media, targeted public announcements in relevant subway stations, and on platform video screens in subway stations. Customers travelling on enabled routes were made aware of the ongoing pilot through interior and exterior Wi-Fi decals on enabled buses and via floor decals at free public Wi-Fi enabled route bus bay boarding locations.

Figure 2: Marketing Samples Free Wi-Fi on Buses Pilot

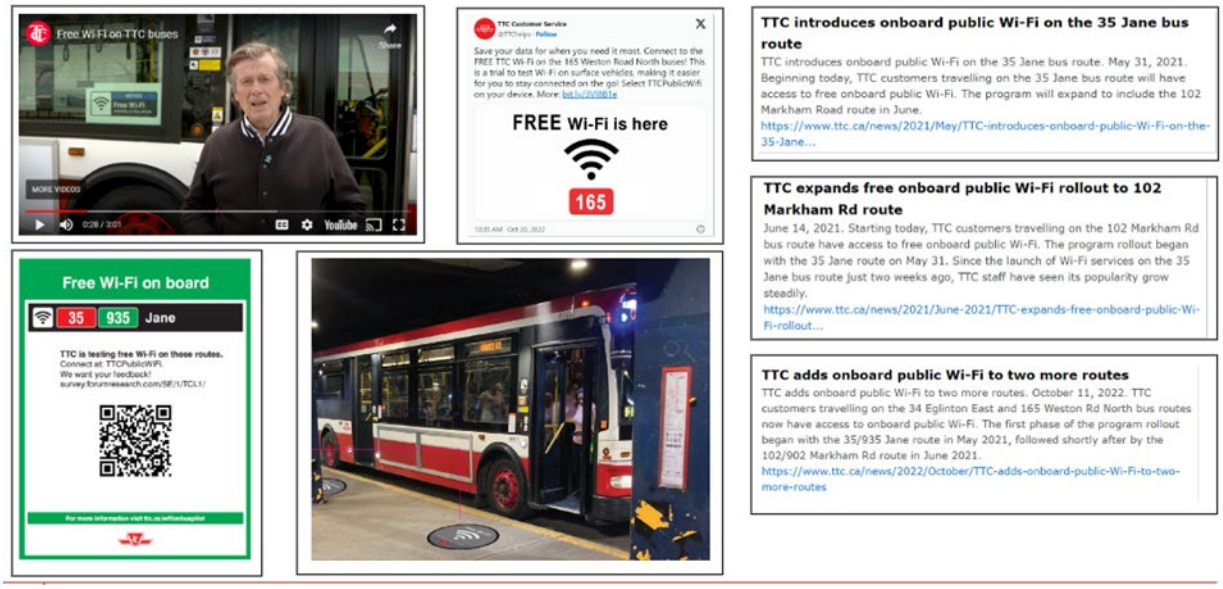
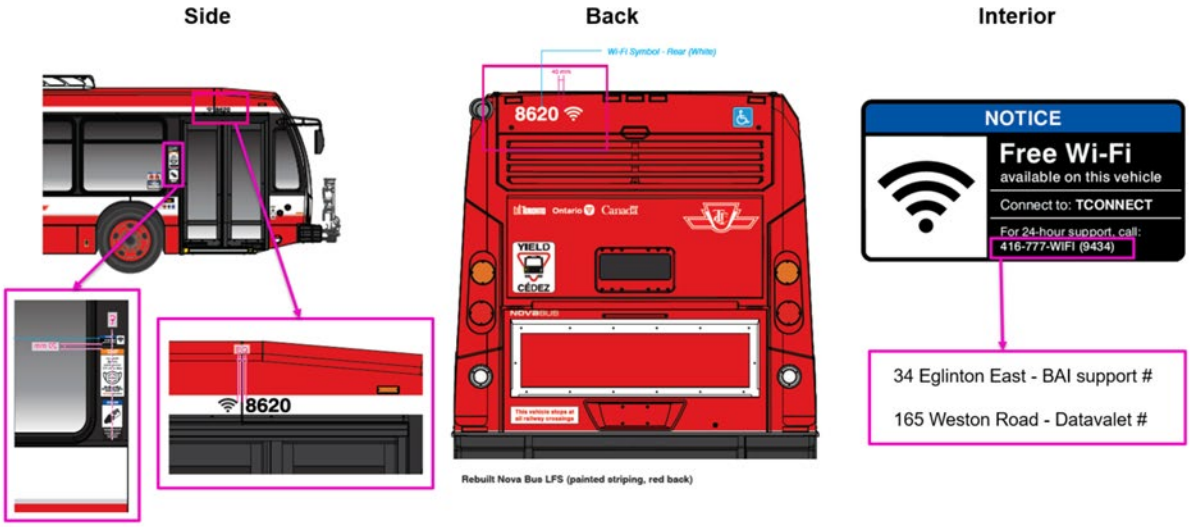


Figure 3: Vehicle Decals Free Wi-Fi on Buses Pilot



Pilot Design

Through the pilot, the TTC sought to understand the feasibility of a free Wi-Fi amenity onboard buses and the implications of an in-house managed solution versus 'turnkey' fully vendor managed services using market proposed solutions and fully vendor supported infrastructure.

The pilot involved two phases and two technology streams. In Phase 1, the TTC evaluated a solution making use of existing on-bus routers supplied by the TTC's computer-aided dispatch (CAD) automatic vehicle location (AVL) solution provider, Clever Devices. Stream 1 enabled buses ran on the 35/935 Jane and the 102/902 Markham Road routes.

In Phase 2, the TTC engaged the market through a publicly posted expression of interest and request for proposal for the supply, delivery, support, documentation, testing and commissioning, operation, and maintenance of a six-month public internet pilot solution. Following this competitive procurement, the TTC awarded two Stream 2 contracts, each for one public Wi-Fi pilot on up to 40 buses for a six-month term at no cost to the TTC to BAI Communications Inc. (BAI) and Datavalet Technologies Inc. (Datavalet). Each contract included an extension option for up to one year at cost to the TTC. Stream 2 enabled buses ran on the 34 Eglinton East and 165 Weston Road North routes.

For security reasons, the pilot design necessitated Stream 1 and Stream 2 solutions to be fully physically isolated from the TTC operating network. It was imperative that there be no overlap or interference between the public Wi-Fi system and the operational infrastructure of TTC, encompassing both the functioning of vehicles and infrastructure (inclusive of aspects such as ensuring safe vehicle operation, computer-aided dispatch/automatic vehicle location systems, passenger counting mechanisms, etc.) and activities transpiring off the vehicles (encompassing communication systems within garages and stations, electric bus charging systems, etc.).

Internet Services Scope

During the pilot, free public Wi-Fi was available to customers on pilot routes for web browsing, email, and push notifications. Streaming services and “peer to peer” program traffic was not permitted.

Customer Support Scope

In Stream 1, the TTC provided customers with a trouble shooting FAQ for technical support related to connecting to Wi-Fi. Stream 2 vendors provided 24-7 technical service support for customers through call center services.

Solution Reporting Capabilities

The Stream 1 solution was able to report on data usage only.

The Stream 2 solutions were capable of more advanced and relevant reporting and data points related to usage and adoption, including the number of unique logins or the number of user sessions generated. The Stream 2 solutions also provided dynamic usage dashboards capable of near real time reporting.

Data Costs

The pilot cost the TTC $80,000 per month on average for LTE data, security, and content management.

Key Findings

Feasibility

It is technically feasible to offer free public Wi-Fi on board TTC buses and all piloted solutions were found to be feasible in the TTC environment. Piloted solutions involved an on-board router, mounting brackets, a power supply, wiring, roof mounted antennae, and a SIM for each vehicle.

Potential Revenue Generation

It is technically possible to deliver public Wi-Fi as an ad supported service, although no revenue was generated through the pilot. No revenue generating partnerships or cost offset opportunities were identified.

Operational Complexity due to Non-Standard Fleet Configuration

Managing and maintaining separate Wi-Fi enabled sub-fleets and dispatching them on designated routes in opposing quadrants of the City was found to be an unsustainable operating model. Non-standard fleet configuration was found to limit operational flexibility in responding to operational issues and introduced complexity in fleet management decision making. This logistical challenge presents notable operational drawbacks to delivering free public Wi-Fi on a sub fleet.

Meeting Emerging Operational Requirements

The TTC dispatches buses to meet emerging operational and safety requirements. During pilot design, a conscious decision was made to prioritize responding to emerging operational issues over limiting Wi-Fi enabled buses to only pilot routes. As a result, on average over the course of the pilot, Wi-Fi enabled buses were available to customers on pilot routes between 68 to 88 per cent of the time. This meant that on average, 20 per cent of the time, a customer boarding a bus on a pilot route was not boarding a bus that offered Wi-Fi.

Adoption of Free Wi-Fi

On average over the course of the pilot, between five and seven per cent of customers adopted free Wi-Fi. However, as was noted above, Wi-Fi enabled buses were available to customers on pilot routes less than 100 per cent of the time (between 68 to 88 per cent of the time). To account for this, the overall adoption rate may have been up to 20 per cent higher, between six and nine per cent.

Customer Feedback

71 per cent of customers who used the pilot free Wi-Fi service and who provided feedback through an online user survey stated that they were very satisfied with the service and likely to use it again.

User Session Duration and Device Type

User sessions during the pilot were on average between 10 and 20 minutes and most customers connected using a cellphone (Stream 2 data).

Captive Portal and Terms of Use

The pilot involved design of a captive portal and landing page along with terms of service that customers were required to accept prior to use.

Discussion of Adoption Factors

Customers already in possession of a wireless plan with sufficient data do not benefit from a free public Wi-Fi service as their costs are already sunk. Market trends toward decreased individual consumer wireless services costs and larger data offerings may make free public internet services a potentially less valued amenity.

Adoption rates during the pilot may also have been low due to customer preference for the increased cybersecurity offered by private internet connections as opposed to public Wi-Fi connections which are unsecured.

Conclusion

The Wi-Fi on bus pilot demonstrated the technical potential to offer a Wi-Fi amenity to customers on board TTC buses. Adoption rates of the amenity were low, cost reduction or cost offset opportunities were not identified, and challenges were identified during the pilot related to support and sustainment of Wi-Fi infrastructure on board fleet. As a result, staff were asked to evaluate options to make Wi-Fi available to surface network customers within public areas in fixed infrastructure (e.g. stations) where customers are likely to be waiting to board surface vehicles, discussed in the body of this report.

The TTC is grateful to our partners (in no particular order) Clever Devices, Datavalet, BAI, and Rogers for their expert advice and professionalism in delivering this pilot.

Attachment 2 – Industry Scan – Public Internet Services in Public Transportation

TTC compared business and operating models of agencies offering public Wi-Fi and cellular services. Information in Table 1 is derived from publicly available sources and may not represent the most up to date information for each agency.

Table 1: Industry Scan – Public Internet Services in Public Transportation

Agency	Public Internet Services Coverage (est.)	Capital Investment (est.)	Annual operating cost (est.) ($)	Average operating cost per bus per month (est.) ($)	Business Model
MTA	On bus – 4,200 buses DISCONTINUED	N/A	3.3M USD	N/A	• Discontinued January 2023 due to high cost and low adoption by customers (1.5% on local buses and under 5% on express buses)
	In fixed infrastructure Plan to expand to all tunnels and stations in next 10 years	$600 million	N/A	N/A	• Delivered in partnership with Transit Wireless • Transit Wireless will share revenue generated through licensing fees, monetizing data analytics and renting out fiber to private companies with the MTA
Metrolinx	On bus – 555 buses On train – 91 locomotives (979 bi-level passenger coaches)	$65 million for a five-year wireless internet contract	N/A	N/A	• Outsourcing – contracted to Icomera • At cost to Metrolinx • Supported customer portal, preloaded entertainment content • Banner marketing ads
	Available at 55 GO Station and Bus Terminal locations	N/A	N/A	N/A	• Delivered in partnership with IMA Outdoor/Pattison • Wi-Fi coverages extend to platforms, parking lots, interior station waiting areas, transit shelters and parking lots • Wi-Fi in the York GO Concourse at Union Station is delivered in partnership with TD-Bank. The Wi-Fi service is provided by BAI Canada

Agency	Public Internet Services Coverage (est.)	Capital Investment (est.)	Annual operating cost (est.) ($)	Average operating cost per bus per month (est.) ($)	Business Model
Translink	RapidBus routes and some articulated buses; most SeaBus vessels; Skytrain cars; six key transit hubs; SeaBus terminals; two stations and two exchanges.	Cost Neutral			• Delivered in partnership with Rogers Communications • Wi-Fi services at no cost to Translink
City of Hamilton	On bus – approximately 267 vehicles DISCONTINUED	N/A	N/A	N/A	• 17-month pilot for 15 buses, ended March 2020 • Decision to discontinue due to cost • Pilot funded by Public Transit Infrastructure Fund and City of Hamilton
OC Transpo	Available at 12 O-Train stations	N/A	N/A	N/A	• Delivered in partnership with Telus
Houston Metro	Available on all buses, On-demand and paratransit vehicles.	N/A	N/A	N/A	• Not provided at bus terminals for safety/security reasons
Port Authority of New York and New Jersey	Available at bus terminals	N/A	N/A	N/A	• Service is subject to 30-minute expiration • Service is provided by Boingo Wireless