



Results of the King Street Transit Pilot

Date: April 11, 2019
To: TTC Board
From: Chief Customer Officer

Summary

The King Street Transit Pilot began on November 12, 2017 providing greater priority for the TTC's King streetcar customers between Bathurst Street and Jarvis Street over the past year and a half.

From a transit perspective, the pilot project is a success:

- **Faster and more predictable transit travel times:** On average, streetcars now travel faster during all periods of the day and times are more predictable, making the service more attractive. Approximately 30,000 minutes of travel time are saved by King streetcar customers daily.
- **More people taking transit along the King Street corridor:** With more predictable travel, more people are taking King streetcars than ever, with daily weekday ridership growing by 16% from 72,000 to 84,000 boardings per day. Capacity grew on King Street through the pilot project to meet unprecedented increases in demand.
- **Greater customer satisfaction with King streetcar service:** Prior to the pilot, overall customer satisfaction with King streetcar service was low on key measures such as travel time, comfort, and wait time. Through the pilot period, customer satisfaction on all these measures has significantly improved.
- **Improved efficiency and reliability of streetcar operations:** Streetcar service on King Street is now more productive, with 25% more customers per hour of service operated. Overall reliability has improved with reduced variability in the busiest portion of the route.

TTC and City staff recommend that the pilot project be made permanent as the *King Street Transit Priority Corridor* with immediate enhancements to the pilot design, such as improvements to streetcar stops and improved signage at intersections.

Furthermore, the TTC tentatively plans on rehabilitating streetcar track on King Street between Dufferin Street and Parliament Street in stages through 2023; providing an opportunity for the City and TTC to implement permanent changes to the street to further enhance transit, public realm, and local access.

As part of the 5-Year Service Plan and 10-year Outlook, the TTC will recommend future transit pilot projects on bus and streetcar corridors.

This report summarizes the performance of the King Street Transit Pilot from a transit perspective. It complements the attached joint City-TTC report, entitled “The Future of King Street: Results of the Transit Pilot”, to be considered at Executive Committee on April 9, 2019 and City Council on April 16, 2019. Recommendations in that report for Committee and Council approval were developed jointly between TTC and City staff.

Recommendations

It is recommended that the TTC Board:

1. Endorse the findings of the joint City-TTC report, attached, entitled “The Future of King Street: Results of the Transit Pilot”, to be considered at Executive Committee on April 9, 2019 and City Council on April 16, 2019.
2. Request that City Council approve the recommendation in the “The Future of King Street: Results of the Transit Pilot” that King Street continue to operate as a Transit Priority Corridor between Bathurst Street and Jarvis Street.
3. Request that the City further monitor and assess the late-night performance of the King Street Transit Priority Corridor to inform the consideration of changes to improve transit operations.
4. Note that TTC staff, in collaboration with the City, will initiate discussions on longer-term improvements to the King Street Transit Priority Corridor to be aligned with track reconstruction planned for 2023.

Financial Summary

The recommendation to permanently operate King Street as a transit priority corridor between Bathurst Street and Jarvis Street is not expected to result in any financial impact to the TTC, however it is anticipated to result in both operating and capital budget impacts for other City programs and agencies.

Capital Budget Impacts

Capital funding needed for permanent improvements to the King Street Transit Priority Corridor for TTC stops and public realm spaces is estimated at \$1.5 million. These costs will be funded within the City’s Transportation Services 2019 Capital Budget through a combination of capital project reallocations and a draw from the City’s Public Realm Reserve Fund.

The recommendation of this report do not result in any increased costs impacting the TTC’s 2019 Capital Budget. Longer-term TTC capital improvements to the King Street Transit Priority Corridor will be reviewed in concert with planned surface track reconstruction in 2023 for consideration by the Board as part of future year budget processes.

Operating Budget Impacts

The City's Transportation Services anticipates an operating cost of \$0.750 million to operate the project for the remainder of 2019. These costs are associated with traffic system maintenance, maintenance of public realm spaces and seasonal maintenance and operations and will be accommodated within the 2019 Operating Budget for Transportation Services.

Transportation Services also expects a small loss of user fee revenue (\$16,800) associated with continuing to waive application fees for outdoor cafes and public installations on a curb lane for 30 curb lane public space areas.

As part of the King Street Pilot project, the Toronto Parking Authority removed 180 on-street parking spaces on King Street, offset by the addition of 100 new on-street spaces on side streets. This change results in an estimated net increase of \$0.9 million in Toronto Parking Authority revenue.

The recommendation of this report do not result in any increased costs impacting the TTC's 2019 Operating Budget for service provided on the King Street Transit Priority Corridor.

King Street Pilot – Project Cancellation

Should the King Street Transit Priority Corridor not be approved the capital cost to reinstate King Street to its pre-pilot roadway configuration is estimated at \$0.5 million. This cost will need to be funded within the City's Transportation Services 2019 Capital Budget through capital project reallocations.

There would also be an additional operating cost for the TTC for the 504 King streetcar service of \$0.132 million assuming the loss of travel time improvements and adjusted for service reductions due to reduced demand. This cost is not included in the TTC 2019 Operating Budget.

The Chief Financial Officer has reviewed this report and agrees with the financial summary information.

Equity/Accessibility Matters

Streetcar service in the King Street corridor is provided by accessible streetcars. TTC and City of Toronto staff worked closely with members of the Advisory Committee on Accessible Transit (ACAT) prior to the launch of the pilot project to ensure that accessibility was a key consideration in the design of relocated transit stops and that access for paratransit customers would be maintained throughout.

As part of the pilot project, the following measures were implemented to maintain and enhance accessible transit:

- Ramps constructed from sidewalk to street level at relocated far-side streetcar stops for customers using mobility devices to access low-floor streetcars

- Tactile attention indicator tiles to designate larger customer waiting areas at each street level stop and improve safety for customers with vision loss
- New accessible loading areas were designated in the curb lane throughout the pilot zone, which can be used by TTC Wheel-Trans services
- TTC Wheel-Trans vehicles are permitted to travel freely through the pilot area

Potential future improvements, such as constructing bump outs at each transit stop as recommended in the next steps section below, would further enhance accessible service along the King Street corridor.

Decision History

At the July 11, 2016 TTC Board Meeting, City Planning and the TTC presented an introduction to the King Street Pilot Study (then called the King Street Visioning Study): [https://www.ttc.ca/About the TTC/Commission reports and information/Commission meetings/2016/July 11/Agenda/index.jsp](https://www.ttc.ca/About%20the%20TTC/Commission%20reports%20and%20information/Commission%20meetings/2016/July%2011/Agenda/index.jsp)

The TTC Board endorsed the King Street Transit Pilot project at its meeting on June 15, 2017:

[http://www.ttc.ca/About the TTC/Commission reports and information/Commission meetings/2017/June 15/Agenda/index.jsp](http://www.ttc.ca/About%20the%20TTC/Commission%20reports%20and%20information/Commission%20meetings/2017/June%2015/Agenda/index.jsp)

City Council approved the King Street Transit Pilot for a one-year period at its meeting on July 4, 2017:

<http://app.toronto.ca/tmmis/viewAgendaItemHistory.do?item=2017.EX26.1>

At the October 16, 2017 TTC Board Meeting, the TTC Board endorsed the framework for monitoring and evaluation for the King Street Pilot:

[http://www.ttc.ca/About the TTC/Commission reports and information/Commission meetings/2017/October 16/index.jsp](http://www.ttc.ca/About%20the%20TTC/Commission%20reports%20and%20information/Commission%20meetings/2017/October%2016/index.jsp)

At the December 4, 2018 City Council meeting, City Council approved an extension of the pilot period to July 31, 2019, to allow for analysis and reporting on the pilot project:

<http://app.toronto.ca/tmmis/viewAgendaItemHistory.do?item=2019.CC1.5>

Issue Background

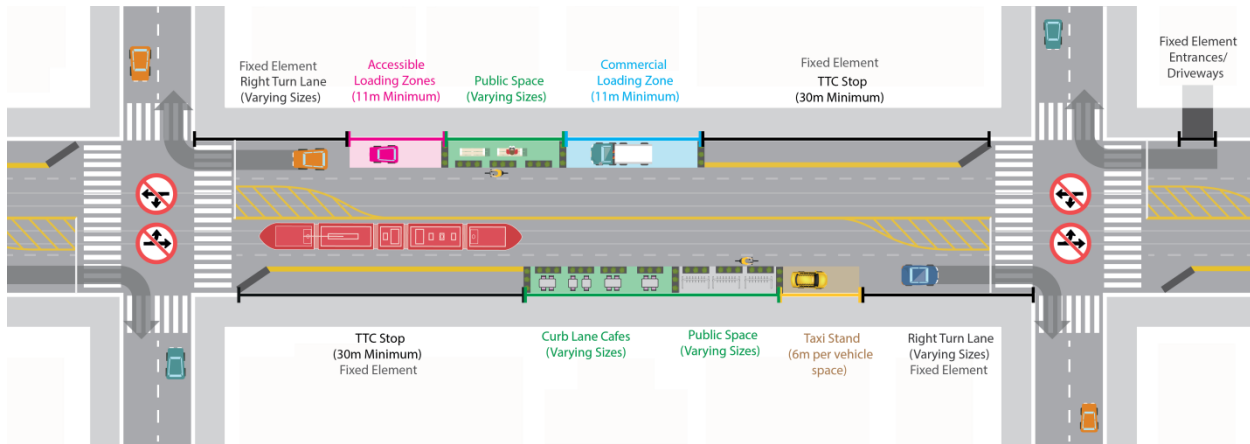
The King Street Transit Pilot began on November 12, 2017 to improve transit service on one of TTC's busiest surface transit routes, the King streetcar. The implementation followed the *King Street Visioning Study* and a comprehensive community and stakeholder engagement that informed the pilot's design and key priorities.

The pilot design, as illustrated below in Figure 1, discouraged through private automobile traffic on King Street between Bathurst Street and Jarvis Street. Generally, all traffic is required to turn right off of King Street at each major intersection, with the exception of streetcars, buses, TTC-operated Wheel-Trans vehicles, and bicycles. A further exemption for taxis is provided between 10:00 p.m. and 5:00 a.m.

To improve safety at streetcar stops and to accommodate dedicated right-turn lanes, streetcar stops within the pilot zone were relocated to the far side of the intersection at most locations. The curb lane at the stops were repurposed to provide dedicated space for waiting customers and to allow for direct boarding from the street.

The result of these changes was significantly reduced automobile volumes that provided less congested and more predictable travel for streetcars and TTC customers.

Figure 1: Typical Street Block in King Street Transit Pilot Zone



Transit Evaluation Framework

The framework to assess the King Street Transit Pilot was outlined in the October 16, 2017 TTC Board report entitled, “King Street Pilot: Monitoring and Evaluation”. From a transit perspective, the success of the pilot is defined by improvements to transit performance informed primarily by three metrics: reliability, ridership and travel times.

The City’s report, attached, and available online (<http://app.toronto.ca/tmmis/viewAgendaItemHistory.do?item=2019.EX4.2>) expands the evaluation to include the travel experience for other modes, the economic impacts on businesses, and the success of the public realm program.

Comments

The success of the King Street Transit Pilot can be summarized into four key points:

- Predictable and faster transit journeys
- Improved efficiency and reliability of streetcar operations
- More people taking transit in the King Street corridor
- Greater customer satisfaction with King streetcar service

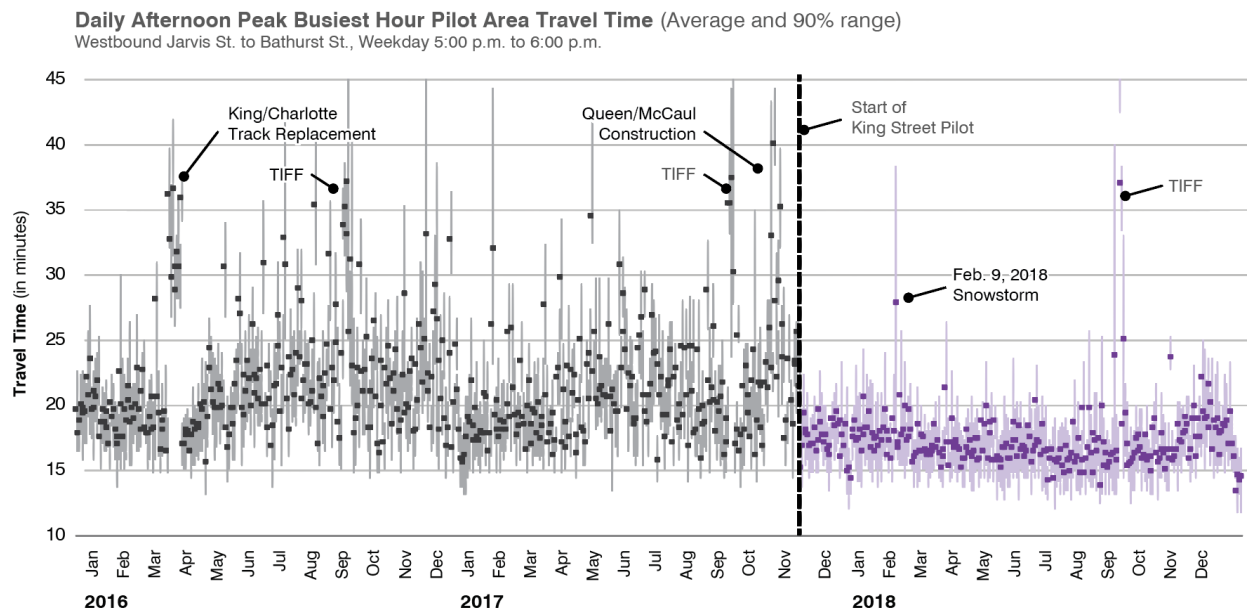
Detailed performance assessment for each of these points can be found in Appendix 4 of the attached joint City-TTC report.

Success #1: Transit journeys on King Street are faster and more predictable.

Average transit journey times through the pilot area have improved during all periods of the day, with a 1 to 2 minute travel time improvement in the morning peak period and a 3 to 4 minute travel time improvement in the afternoon peak period. Worst case travel times in the afternoon peak improved by 15 to 20%, or between 4 to 5 minutes. On average, King streetcar customers are saving approximately 30,000 minutes of travel time per day.

Moreover, the most significant improvement to transit on King Street is that streetcar journeys are not only faster, but more predictable. This means that customers can board a streetcar with more confidence that they will arrive to their destination by a certain time. As Figure 2 shows, variability in travel time in the afternoon commute was reduced dramatically upon the start of the pilot period. Travel times today during the busiest hour rarely exceed 20 minutes, whereas prior to the pilot, travel times were regularly above 25 minutes.

Figure 2: Daily Pilot Area Travel Time – Afternoon Busiest Hour/Direction



Success #2: Streetcar operations are more efficient and reliable.

In general, the King Street Transit Pilot has resulted in more reliable, productive and efficient operation of streetcar service in the corridor. This results primarily from reduced travel time variability. Data shows that bunching of streetcars is less frequent during the busiest times of the day. Wait time data also indicates that the proportion of streetcars arriving within 4 minutes during peak periods was maintained around 80% through the pilot period.

The King Street Transit Pilot also improved on-time performance of the service relative to other mixed-traffic streetcar routes as a result of reduced travel time variability and increased route supervision.

Finally, from a route productivity perspective, the ridership gains relative to the cost of operating the service resulted in a more cost-effective service. A common measure for cost-efficiency and productivity of transit service is the number of customers per hour of service operated. Increased ridership during the pilot has increased route productivity by 25% to approximately 125 boardings per hour of service.

Figure 3: Route Productivity

	King Streetcar Corridor			Other Routes (for comparison)		
	Pre-Pilot	March 2018	October 2018	510 Spadina	501 Queen	29 Dufferin 929 Dufferin
Daily Ridership	72,000	81,000	84,000	40,000	55,100	42,300
Scheduled Revenue Hours	710	780	670	270	820	530
Boardings per Revenue Hour	101	104	125	148	67	80

Success #3: More people are taking transit in the King Street corridor.

Ridership on streetcars on King Street immediately increased upon the implementation of the pilot project in mid-November 2017. Increases were observed at all times of the day, including in off-peak periods and on weekends.

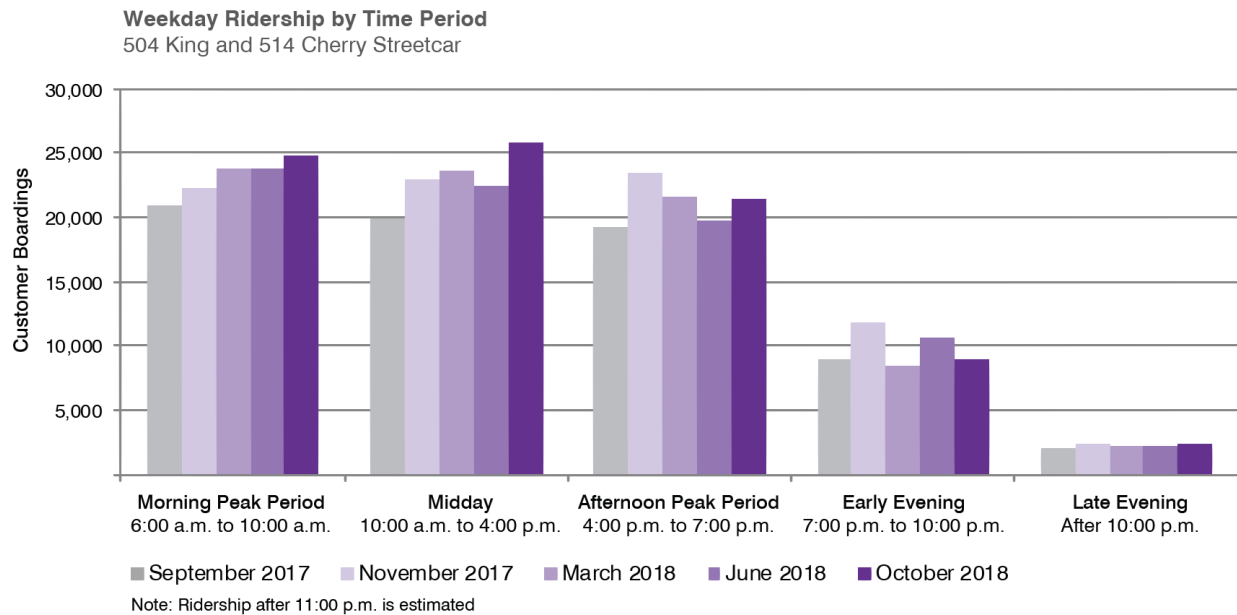
Figure 4 shows the weekday route-wide ridership totals for the 504 King and 514 Cherry streetcar routes. Overall, weekday ridership has increased by nearly 17% between September 2017 and October 2018 to approximately 84,000 customers per day. Figure 5 shows that ridership increases are consistently observed at most times of the day, particularly in the midday, where ridership has increased between 10% and 25%. Early evening and weekend ridership fluctuates depending on time of year due to special events occurring in the downtown and weather.

Figure 4: Streetcar Ridership in King Street Corridor

	Pre-Pilot	November 2017	March 2018	June 2018	October 2018
Daily Ridership	72,000	84,000	81,000	80,000	84,000
Saturday Ridership	52,700	61,500	52,600	56,300	No data
Sunday Ridership	44,800	52,200	44,700	47,900	No data

NOTE: Daily ridership prior to October 2018 includes boardings for 504 King and 514 Cherry streetcar routes

Figure 5: Weekday Ridership by Time Period



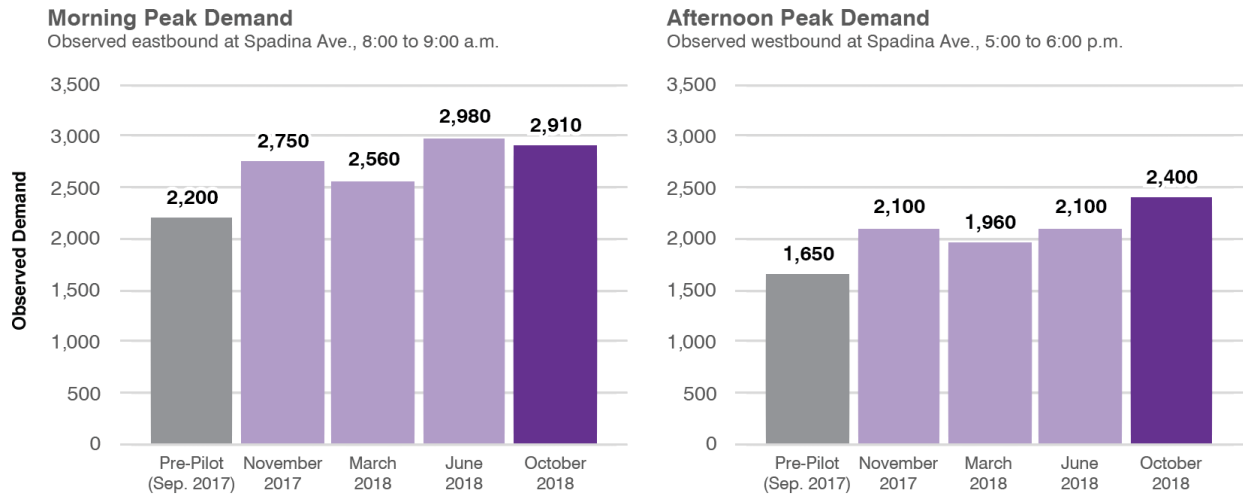
Streetcars are busier than ever on King Street during peak commuting times

The peak point, peak hour demand for the surveyed periods is provided in Figure 6 for the morning and afternoon peak hours. In October 2018, morning peak hour demand increased by over 30% while the afternoon peak hour demand increased by 45% from the September 2017 baseline. Improved and more reliable service delivery, particularly in the afternoon rush hour, likely contributed to greater demands.

TTC responded by increasing capacity on the route with full deployment of low-floor streetcars

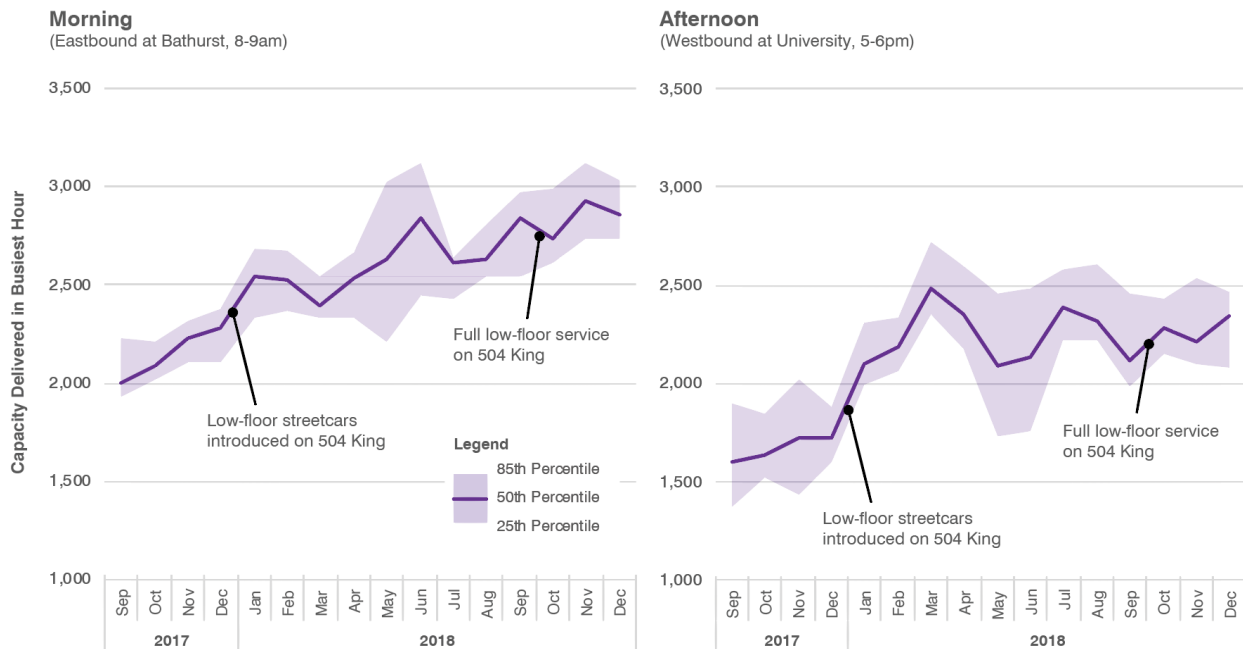
Figure 7 illustrates the monthly average and range of streetcar capacity delivered at the peak point in the morning and afternoon peak periods. Since the start of the pilot, delivered capacity has increased from approximately 2,000 customers per hour in the morning peak period to approximately 2,900 customers per hour. In the afternoon peak period, it has increased from approximately 1,600 customers per hour to approximately 2,400 customers per hour. Despite this increase, overcrowding is still observed at the busiest times. Further measures to increase capacity will be explored, including adding more streetcars or reintroducing supplemental bus service at the busiest times.

Figure 6: Peak Demand



Note: Observed peak demand is the number of customers observed in the busiest direction, at the busiest location, in the busiest hour.

Figure 7: Peak Capacity Operated



Note: Capacity delivered calculated based on vehicle capacity as defined by TTC Service Standards. Peak period standards for bus (51), CLRV streetcar (74), ALRV streetcar (108), and low-floor streetcar (130)

Success #4: Greater customer satisfaction with King streetcar service.

The King Street Transit Pilot has improved perceptions of customer satisfaction with transit service in the King Street corridor. The TTC conducts a quarterly Customer Satisfaction Survey (CSS) that provides an insight on perceptions of TTC service and operations. Since the start of the King Street Transit Pilot, satisfaction has increased significantly on two key measures that can be attributed to the pilot: overall satisfaction and trip duration. In 2018, perceptions of trip duration, a key driver of overall customer satisfaction, averaged 88%, which is the highest of all streetcar routes.

Key Conclusions

1. *King Street Transit Pilot successfully improved transit in the corridor and should be made permanent*

The King Street Transit Pilot has resulted in positive results for the three key aspects of performance measurement: travel time, reliability, and ridership. The benefits, relative to the investment in the project, are unprecedented for the TTC.

2. *Pilot approach provided flexibility for adjustments and learnings to inform a permanent design and a model for future transit projects*

The pilot involved an unprecedented program of data collection and analysis for a transportation project in Toronto. This was required in order to assess the impacts of the project not only for transit, but for other modes of transportation and the community. The data analysis allowed for more responsive adjustments to the pilot project, such as service changes to accommodate increased ridership.

The pilot program also allowed for changes to operations of traffic signals and adjustments to elements such as streetcar stop configuration and curbside uses. For example, at the start of the pilot project, transit signal priority was disabled to observe overall traffic implications of the proposed pilot design. Upon better understanding of the impact on surrounding traffic patterns, transit signal priority was re-enabled in July 2018.

3. *Pilot project demonstrated the cooperation between TTC and City essential for success of future transit projects*

From early planning stages through design and implementation, the TTC worked closely with City Planning and Transportation Services staff to make the King Street Transit Pilot a reality. The alignment of common goals for mobility, land use, and placemaking created a stronger coalition to advance the project than if the respective priorities were presented individually. The King Street Transit Pilot has provided a framework on which future projects can proceed.

Next Steps

Recommendations for immediate changes

If the King Street Transit Pilot is made permanent, there are immediate-term improvements that can be made to the current design to enhance transit operations and the customer experience in the pilot area. TTC and City staff will work together to implement some of these immediate changes, including:

- **Improved customer experience at TTC stops:** the current stop designs lack weather protection and physical separation from the roadway. TTC staff will work with the City to identify interim stop design improvements where space and context allows, such as shelters, modular raised stop platforms, and real-time information displays
- **Adjustments to TTC stops at busy locations:** the TTC is assessing stop operations at busy locations such as University Avenue to extend stops to allow more than one streetcar to serve the stop at a time to reduce dwell times and delays
- **Investigating opportunities to optimize operations** at both ends of the pilot.
- **Augmented Transit Signal Priority:** The City and TTC will explore additional transit signal priority at intersections where currently signal priority is not provided
- **Improved and illuminated signage:** the City and TTC will work to improve signage within the pilot area to better inform motorists of traffic restrictions

TTC will also continue to make service and schedule adjustments to improve service reliability and capacity on the King Street corridor. The City will work with Toronto Police Services to maintain an effective level of enforcement in the pilot zone.

Recommendations for a permanent design

The TTC plans to reconstruct streetcar tracks on King Street between Close Avenue and Berkeley Street in stages in 2023. This presents an opportunity to implement physical changes to King Street to improve transit and public realm within the pilot area, or beyond. The approval of the King Street Pilot will allow for the City and TTC to begin the engagement of local residents, businesses, visitors, and transit users to make a permanent design that reflects the lessons learned during the pilot.

Some considerations to be part of a permanent design include:

- **Physical roadway alterations:** including bump-outs for transit stops, widened sidewalks and public realm, and accommodation for cycling
- **Streetcar track network enhancements:** improving the intersection of York Street and King Street by adding an additional east-to-north movement that allows for more routing options for diversions or adjustments. Layby tracks within the pilot area may also provide an opportunity to provide greater service resiliency with standby vehicles.

Recommendations for other transit pilot projects

The TTC is undertaking a 5-Year Service Plan and 10-Year Outlook. As part of this study, the TTC will identify other pilot projects for transit priority to be implemented in the near and medium-term.

Contact

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Signature

Kathleen Llewellyn-Thomas
Chief Customer Officer

Attachments

Attachment 1 – City of Toronto Council Report
Attachment 2 – Transit Performance Summary

The Future of King Street: Results of the Transit Pilot

Date: April 2, 2019

To: Executive Committee

From: General Manager, Transportation Services, Chief Planner & Executive Director, City Planning and Chief Customer Officer, Toronto Transit Commission

Wards: 10 (Spadina-Fort York), 13 (Toronto Centre)

SUMMARY

Following an evaluation of the King Street Transit Pilot, this report recommends that King Street continue to operate as a Transit Priority Corridor between Bathurst Street and Jarvis Street, along with some recommendations for improvement. This report provides a summary of the outcomes of the pilot in support of these recommendations.

King Street is a significant east-west corridor in the Downtown, serving the largest concentration of jobs in the entire country. The neighbourhoods along King Street have experienced tremendous growth in the past ten years, and will continue to grow in the future. King Street is also a key destination for culture, heritage, entertainment, and retail. The 504 King streetcar is the busiest surface transit corridor in the entire city and now moves more than 84,000 riders on an average weekday. Only the Yonge-University and Bloor-Danforth subway lines carry more people on transit.

The King Street Transit Pilot originated as part of TOcore, a comprehensive planning study recently undertaken by the City to create a new Secondary Plan and a series of supporting 'infrastructure strategies' for the rapidly growing Downtown in order to provide a long-term blueprint to guide growth and intensification and align it with the provision of infrastructure. King Street was identified as one of Downtown's 'Great Streets', with important transportation and public realm roles.

The pilot was approved by Council on July 4, 2017 and became operational on November 12, 2017. The pilot was about moving people more efficiently on transit, improving public space, and supporting business and economic prosperity.

The King Street Transit Pilot has resulted in many benefits to transit, especially given its relatively cost-effective investment and short implementation timeframe. Key transit benefits include:

- **Faster and more predictable transit travel times:** On average, streetcars now travel faster during all periods of the day and times are more predictable, making the service more attractive. Approximately 30,000 minutes of travel time are saved by King streetcar customers daily.

- **More people taking transit along the King Street corridor:** With more predictable travel, more people are taking King streetcars than ever, with daily weekday ridership growing by 16% from 72,000 to 84,000 boardings per day. Capacity grew on King Street through the pilot project to meet unprecedented increases in demand.
- **Greater customer satisfaction with King streetcar service:** Prior to the pilot, overall customer satisfaction with King streetcar service was low on key measures such as travel time, comfort, and wait time. Through the pilot period, customer satisfaction on all these measures have significantly improved.
- **Improved efficiency and reliability of streetcar operations:** Streetcar service on King Street is now more productive, with 25% more customers per hour of service operated. Overall reliability has improved with reduced variability in the busiest portion of the route.

While a key objective of the pilot was to move people more efficiently on transit, benefits realized on King Street were considered alongside the outcomes for the overall mobility of people and goods on the surrounding road network. Key outcomes for mobility include:

- **More people moving through downtown by all modes:** The total number of people moving east-west through the downtown core has increased by 3% during the morning and afternoon commutes, primarily as a result of increases in transit ridership.
- **Motor vehicle volumes significantly reduced on King Street:** As the design intended, the volume of motor vehicles travelling along King Street within the pilot area has decreased significantly. Nearby streets have experienced some increases in motor vehicle traffic volumes as a result of dispersal,
- **Car travel times are generally the same:** even with traffic dispersal on adjacent routes, there has been minimal impact on travel times for drivers. Average motor vehicle travel times on nearby streets vary +/- less than one minute, compared to before the pilot.
- **The number of pedestrians is generally the same:** total pedestrian volumes have remained stable on King Street as a result of the pilot, relative to comparable east-west streets, including Queen Street.
- **More people are cycling on King Street:** There has been an increase in the number of people cycling along King Street, likely because reduced motor vehicle volumes made it more comfortable to cycle.

The pilot sought to improve public space and support business and economic prosperity along King Street. Key outcomes for this area include:

- **More spaces for people to linger:** Forty-five unique amenities were introduced across 18 new public realm spaces in the curb lane, including cafés, art installations, public seating areas, and parklets. These spaces created opportunities for people to linger, and provided extra space for pedestrians to walk when sidewalks are crowded. Public realm interventions and programs were undertaken to help activate and animate King Street during the pilot, reinforcing King Street's vibrancy as a major cultural and entertainment destination.
- **Growth in customer spending has marginally decreased:** Point-of-sale customer spending data suggests that year-over-year growth in total spending on King Street has decreased slightly (0.8%) after the pilot was installed, with reductions primarily

to spending in the restaurant sector. This was in keeping with trends that existed before the pilot was installed.

- **Business license turnover is lower than the surrounding area:** While business license cancellation rates within the King Street pilot area increased marginally in 2018, the rate of cancelled business licenses within the King Street pilot area is consistently lower than the rate for the surrounding area and city-wide over the last three years.

A comprehensive community and stakeholder engagement process was undertaken that informed the pilot's design and key priorities. A robust monitoring and evaluation program was established to assess the project's benefits and impacts. A data dashboard was published regularly on the project website:

www.toronto.ca/kingstreetpilot.

In summary, the King Street Transit Pilot has demonstrated, relatively quickly and cost-effectively, its ability to move people more efficiently on transit without compromising the broader transportation road network.

This report has been prepared in collaboration with the Chief Executive Officer of the Toronto Transit Commission (TTC).

RECOMMENDATIONS

The General Manager, Transportation Services, the Chief Planner & Executive Director, City Planning and the Chief Customer Officer, Toronto Transit Commission recommend that:

1. City Council authorize that King Street continue to operate as a Transit Priority Corridor between Bathurst Street and Jarvis Street, along with the incorporation of improvements to the public realm in the near-term through the durability and quality of public realm materials, and in the longer-term through streetscaping improvements in coordination with private development and the capital program.
2. City Council remove the regulation effective end date of July 31, 2019 from any traffic and parking regulation amendments processed and submitted on or before July 31, 2019 by the General Manager of Transportation Services directly to City Council pursuant to the General Manager of Transportation Services delegated authority as adopted by City Council in Item 2017.EX26.1 such authority as amended by City Council in Item CC1.5.
3. City Council amend Section 937-3.6 of City of Toronto Municipal Code Chapter 937, Temporary Closing of Highways, by deleting the phrase “but ending no later than July 31, 2019” and replacing it with the phrase “but ending no later than April 14, 2020” such that the General Manager, Transportation Services, may until July 31, 2019 be delegated the authority to temporarily close to vehicular traffic portions of the curb lanes on King Street West and East for any length of time but ending no later than April 14, 2020 for the King Street Transit Pilot – Outdoor Cafes and Public Installations in the

Curb Lane Public Spaces and to exempt the General Manager, Transportation Services in carrying out this delegation from Section 937-5 of Chapter 937.

4. City Council authorize the continuation until April 14, 2020, inclusive, of outdoor cafes and public installations and the temporary closure, to vehicular traffic, of the required sections of the curb lanes, including any by-law amendments required to do so, as adopted by City Council in Item 2018.TE30.50.

5. City Council amend, despite any provision to the contrary in the new Municipal Code chapter for sidewalk cafes, parklets and marketing displays, as adopted by City Council in Item EC2.3, the various delegated authorities of the General Manager, Transportation Services, as well as the delegated authorities of the Executive Director, Municipal Licensing and Standards, respectively, as adopted by City Council in Item 2017.EX26.1 and as adopted by City Council in Item 2017.TE30.50 and as adopted by City Council in Item CC1.5, as such delegated authorities relate to their authority to issue permits and enter into agreements for the operation of an outdoor café or public installations on a curb lane on King Street West and East between Bathurst Street and Jarvis Street, which authorities are currently in effect until July 31, 2019 to take effect until April 14, 2020.

6. City Council request the Acting President, Toronto Parking Authority to end the parking promotion currently being offered for the King Street Transit Priority Corridor area.

7. City Council request the General Manager, Transportation Services to further monitor and assess the late-night performance of the King Street Transit Priority Corridor, particularly within the Entertainment District and King West, to inform the consideration of changes that could improve transit performance while ensuring for the safe and effective dissipation of people from nightlife activity on King Street West.

FINANCIAL IMPACT

The capital funding required to make permanent and incorporate improvements to the King Street Transit Priority Corridor is expected to be approximately \$1.5 million (excluding HST recoveries). This funding is needed for improvements to TTC stops and public realm spaces. Funding for these elements is not currently identified within the Capital Budget and would need to be reallocated from elsewhere within the 2019-2028 Capital Budget & Plan for Transportation Services. While reallocations within the 2019 Capital Budget would partially offset the estimated requirement of \$1.5 million, Transportation Services would seek Council approval to fund the remaining costs from the Public Realm Reserve Fund.

The funding required to operate and maintain the project for the remainder of 2019 is expected to be approximately \$750,000 (excluding HST recoveries). This funding is needed for traffic signal maintenance, maintenance of public realm spaces and seasonal maintenance and operations. Funding for this maintenance is not currently identified within the 2019 Operating Budget, but would be accommodated within the 2019 Operating Budget for Transportation Services. Funding required for ongoing

maintenance costs would be considered as part of future operating budget submissions for Transportation Services.

The application fee as found as reference no. 36.1 under Chapter 441, Fees and Charges, Appendix C, Schedule 2, Transportation Services, for applicants for outdoor cafes and public installations on a curb lane would continue to be waived. This application fee is related to the right-of-way permit application fee and is proposed to continue to be waived since the curb lane will be used to expand the public realm. Charging this fee for thirty (30) curb lane public space areas would represent approximately \$16,800 based on the current permit fee and non-recoverable portion of HST.

Outdoor café application fees and permit fees would still apply. Other costs related to the outdoor cafes and public installations on a curb lane would be borne by the establishments or individuals seeking permission to construct and maintain these curb lane public spaces.

Transportation Services worked closely with the Toronto Parking Authority (TPA) regarding the impact of removing approximately 180 on-street parking spaces on King Street as part of the pilot project. The annual revenue not generated from these spaces was approximately \$1.5 million. While approximately 180 on-street parking spaces were removed from King Street as a result of the pilot, approximately 100 new on-street parking spaces have been added to side streets since the pilot began. The new annual revenue collected from these spaces was approximately \$2.4 million, representing a net revenue increase of \$0.9 million.

In January 2018, the TPA began offering a parking promotion through the GreenP app to provide customers with a discount of up to \$10 off their parking in the pilot area. Through the end of December 2018, this promotion was used over 78,000 times, representing a value of approximately \$509,520.

The total on-street parking revenue in the pilot area during the year when the parking promotion was in effect (from February 2018 to January 31, 2019) was approximately \$12.8 million. Pay and display off-street parking generated approximately \$2.4 million in this time period. As a comparison, total on-street parking revenue in this area in the year before the pilot was approximately \$9.9 million. Pay and display off-street parking generated approximately \$2.6 million in this time period.

Should City Council not approve the King Street Transit Pilot, the estimated cost to reinstate King Street to its pre-pilot roadway configuration would be approximately \$500,000. Funding for this is not currently identified within the Capital Budget and would need to be reallocated from elsewhere within the 2019-2028 Capital Budget & Plan for Transportation Services. There would also be additional operating costs to the TTC for 504 King streetcar service of approximately \$132,000 assuming the loss of travel time improvements and adjusted for service reductions due to reduced demand. This cost is not included in the TTC 2019 Operating Budget.

The Chief Financial Officer and Treasurer has reviewed this report and agrees with the financial impact information.

DECISION HISTORY

On December 13, 2018, City Council adopted the report CC1.5 Extending the King Street Transit Pilot without amendments:

<http://app.toronto.ca/tmmis/viewAgendaItemHistory.do?item=2019.CC1.5>

On March 26 and 27, 2018, City Council adopted the report TE30.50 King Street Transit Pilot – Outdoor Cafes & Public Installations in the Curb Lane Public Spaces with amendments:

<http://app.toronto.ca/tmmis/viewAgendaItemHistory.do?item=2018.TE30.50>

On October 16, 2017, the TTC Board adopted the report King Street Pilot: Monitoring and Evaluation:

[http://ttc.ca/About the TTC/Commission reports and information/Commission meetings/2017/October 16/Agenda/Agenda.jsp](http://ttc.ca/About%20the%20TTC/Commission%20reports%20and%20information/Commission%20meetings/2017/October%2016/Agenda/Agenda.jsp)

On July 4, 5, 6 and 7, 2017, City Council adopted the report EX26.1 Proposed King Street Transit Pilot – Bathurst Street to Jarvis Street with amendments:

<http://app.toronto.ca/tmmis/viewAgendaItemHistory.do?item=2017.EX26.1>

On June 15, 2017, the TTC Board endorsed the King Street Transit Pilot project:

[http://www.ttc.ca/About the TTC/Commission reports and information/Commission meetings/2017/June 15/Agenda/index.jsp](http://www.ttc.ca/About%20the%20TTC/Commission%20reports%20and%20information/Commission%20meetings/2017/June%2015/Agenda/index.jsp)

At the July 11, 2016 TTC Board Meeting, City Planning and the TTC presented an introduction to the King Street Visioning Study:

[https://www.ttc.ca/About the TTC/Commission reports and information/Commission meetings/2016/July 11/Agenda/index.jsp](https://www.ttc.ca/About%20the%20TTC/Commission%20reports%20and%20information/Commission%20meetings/2016/July%2011/Agenda/index.jsp)

COMMENTS

Background

The King Street Transit Pilot originated as part of TOcore, a comprehensive planning study undertaken by the City to create a new Secondary Plan and a series of supporting 'infrastructure strategies' for the rapidly growing Downtown in order to provide a long-term blueprint to guide growth and intensification and align it with the provision of infrastructure. The tremendous population and employment growth being experienced by the neighbourhoods along King Street today will continue and will result in increased demand for better and more reliable transit service, and additional city infrastructure needs.

King Street has also long been identified as a Surface Transit Priority Route in the City's Official Plan (Map 5). Several past initiatives have been undertaken by the City and TTC to provide more prioritization for transit, with limited effectiveness.

The proposed pilot area was chosen, in part, because of the surrounding well-connected street network that exists east of Bathurst Street. The key streets parallel with King Street - Richmond Street, Adelaide Street, Wellington Street, Front Street, and Queens Quay - do not continue significantly west of Bathurst Street.

Comprehensive community and stakeholder engagement began during the TOcore work and continued through the planning, implementation, and refinement stages of the pilot. Stakeholder engagement informed the pilot's design and key priorities and staff continued to work with the local communities and businesses through pilot implementation to make modifications such as additional loading zones in front of local businesses.

Engagement efforts targeted a range of transportation users, including transit users, pedestrians, cyclists, and drivers. In partnership with local ward Councillors, local Business Improvement Area (BIA) representatives as well as Resident and Neighbourhood Associations were engaged. Outreach activities included public meetings, online surveys, social media advertisements, email updates, flyer and postcard handouts and mailings, and numerous meetings. A detailed summary of community and stakeholder consultation is included as Attachment 6.

Pilot Design

The pilot design, as illustrated below in Figure 1, provides priority for transit on King Street between Bathurst Street and Jarvis Street.

Before the King Street Transit Pilot, the downtown section of King Street operated as a typical major arterial street with two lanes in each direction, and streetcars operating in the median lanes in mixed traffic. From a safety perspective, transit passengers would wait for a streetcar at a nearside stop on the sidewalk and would board by crossing a live lane of moving vehicle traffic, with traffic stopping behind open streetcar doors.

Streetcar service was often slow and unreliable, with unpredictable travel times, especially during rush hours, but also during some late evening and weekend times. Along some parts of King Street, walking was sometimes faster, especially in the areas where traffic congestion was busiest between Bathurst Street and Jarvis Street.

Cyclists would ride in the curb lane, sharing space with vehicle traffic in the peak hours and sharing space with on-street parked vehicles in the off-peak hours. There were limited designated spaces for deliveries, loading, or taxis.

The pilot transformed the 2.6 kilometre long stretch of King Street between Bathurst Street and Jarvis Street into a 'streetcar priority corridor' by restricting through traffic movements at the majority of intersections and allowing only local motor vehicle traffic access.

General traffic is required to turn right off of King Street at most major intersections, with the exception of streetcars, buses, TTC-operated Wheel-Trans vehicles, and bicycles. A further exemption for licensed taxicabs is provided between 10:00 p.m. and 5:00 a.m.

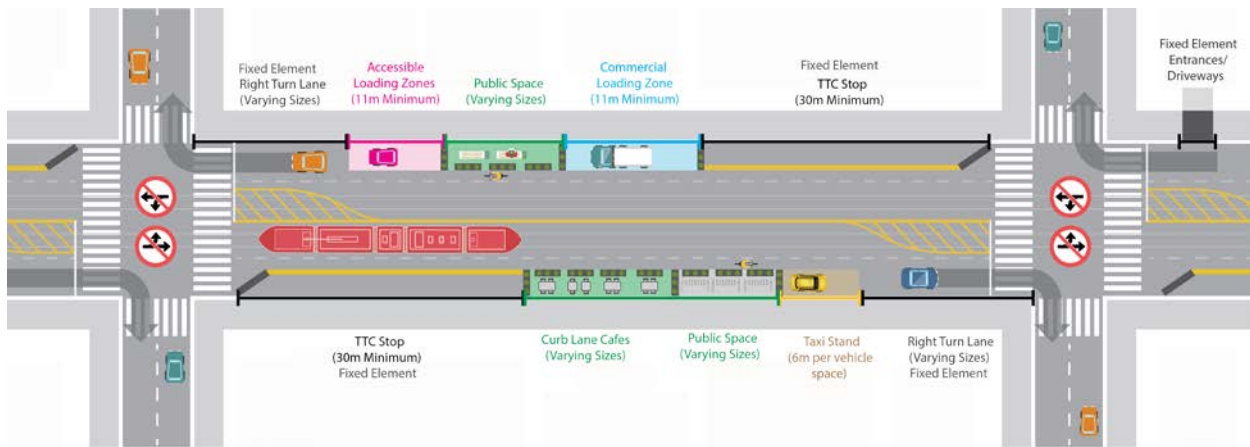


Figure 1. Typical King Street pilot configuration

The key design aspects of the King Street Transit Pilot are outlined below:

Streetcar Stops

To improve safety at streetcar stops and to accommodate dedicated right-turn lanes, streetcar stops within the pilot zone were relocated to the far-side of the intersection at most locations. The curb lane at these locations is repurposed to provide dedicated space for waiting customers and to allow for direct boarding from the street. Each stop is protected by a decorated concrete barrier at one end, and a large round planter at the other end; the long edge of the platform is delineated with a yellow tactile warning surface indicator strip, and each stop has an accessible ramp to connect the sidewalk to the road-level platform for those with limited mobility.

Traffic Operations - Local Traffic Access Maintained

Through movements are not allowed at the majority of signalized intersections within the pilot area, and general traffic is required to turn right off of King Street at most major intersections. Local access to driveways, servicing areas, and other destinations on King Street is maintained.

Transit vehicles, cyclists, and emergency and maintenance vehicles are exempt from the through movement restrictions at all times, with taxis also exempt between 10:00 p.m. and 5:00 a.m.

In addition, no left turns are allowed from King Street onto other streets at all signalized intersections within the pilot area (except streetcars at certain intersections). Prior to the pilot, left-turns were restricted at most locations, but only during the peak periods.

Commercial Loading Zones, Passenger Loading Zones, and Taxi Stands

Commercial and passenger loading zones were installed to allow for the delivery of goods and for passenger pick-up and/or drop-off, with some spaces assigned for passenger loading only. These are available at all times.

The number of spaces in taxi stands has been doubled from 34 to 68 on King Street, with twelve (12) additional spaces on side streets. Taxi stands are now available at all times, and were previously only available during off-peak periods.

Accessibility

City and TTC staff worked closely with members of the Advisory Committee on Accessible Transit (ACAT) to ensure that accessibility was a key consideration in the design and that access for paratransit customers would be maintained. As part of the pilot, the following measures were implemented to maintain and enhance accessibility on King Street:

- Streetcar service in the King Street corridor is provided by accessible streetcars;
- Ramps constructed from sidewalk to street level at relocated far-side streetcar stops for customers using mobility devices to access low-floor streetcars;
- Yellow tactile warning surface indicator strip to designate customer waiting areas at each street level stop and improve safety for customers with vision loss; and
- Accessible loading zones have been implemented on almost every block and are reserved for vehicles with an accessible (disabled) parking placard, including TTC Wheel-Trans services.

Public Realm Spaces

The pilot included a comprehensive public realm program, including the creation of 18 new public realm spaces in the curb lane, complementing the existing parks and public realm spaces along the corridor. Forty-five unique amenities were introduced in these spaces along the corridor, including cafes, art installations, public seating areas, Toronto Bike Share stations, bicycle parking and parklets. These spaces created opportunities for people to linger, and provided extra space for pedestrians to walk when sidewalks are crowded. Businesses and the Business Improvement Areas were invited to activate public spaces that they fronted. Other spaces became available for public art installations, seating, and other public amenities.

A summary of the public realm program and supporting initiatives is included as Attachment 5.

Cycling

Although dedicated cycling lanes were not provided, the design included 1.5-1.8 metres of "clear space" for cyclists between the track and the various curb lane uses in order to maintain a safe space away from the streetcar tracks. In addition, two-stage left-turn bicycle boxes were provided at intersections where a dedicated cycling facility exists on an intersecting north-south street.

TTC Service Adjustments

The TTC implemented a number of operational adjustments and service changes throughout the pilot, including:

- Dedicated on-street supervision at the start of the pilot to actively monitor and manage service.

- Allocation of run-as-directed standby streetcars to reduce gaps and mitigate service disruptions and delays until the regular deployment of low-floor streetcars.
- Accelerated deployment of low-floor streetcars on the 504 King route to increase capacity in response to added demand during the busiest times of the day.
- TTC schedule changes to reflect revised streetcar operating conditions and travel time savings.
- Restructuring of 504 King route in the fall of 2018 to better serve the pilot area and improve service reliability.

Data Collection, Monitoring and Evaluation

The framework to assess the King Street Transit Pilot was outlined in the October 2017 TTC Board Report titled, "King Street Pilot: Monitoring and Evaluation". Data collection and monitoring was generally conducted using intersection cameras and video analytics, Bluetooth readers, and automatic vehicle location technology to measure multi-modal volumes and travel times, and other metrics.

The pilot provided the flexibility to try out new ideas, relatively quickly and cost-effectively. Data collection and monitoring allowed for more responsive adjustments to the pilot project, such as service changes to accommodate increased ridership and changes to operations of traffic signals.

Throughout the pilot, data dashboards have been published regularly on the project website (www.toronto.ca/kingstreetpilot). An Annual Dashboard Summary is included with this report as Attachment 2 and the most recent November - December 2018 Dashboard Update is included as Attachment 3.

The benefits and impacts of the pilot have been summarized below based on three key objectives:

1. Move people more efficiently on transit,
2. Support business and economic prosperity, and
3. Improve public space.

1. Move People More Efficiently on Transit

From a transit perspective, the success of the pilot can be evaluated based on improvements to transit performance informed by reliability, transit travel time, and transit ridership.

The evaluation demonstrated that the King Street Transit Pilot resulted in these tangible benefits, which relative to the investment in the project, are unprecedented for a TTC project:

- Faster and more predictable transit travel times, especially during the evening commute;
- Improved efficiency and reliability of streetcar operations;
- More people taking transit along the King Street corridor; and
- Greater customer satisfaction with King streetcar service.

Faster and More Predictable Transit Travel Times

The most significant improvement to transit on King Street is that streetcar journeys are not only faster, but more predictable. Predictable transit service results in tangible benefits for customers who now can budget less travel time to complete their journeys because they don't need to account for variability. This means that customers can board a streetcar with more confidence that they will arrive to their destination by a certain time. Without the pilot, particularly in the most congested times, transit travel times were highly variable.

A year-over-year comparison (shown in Attachment 2 - Annual Dashboard Summary) demonstrates that the pilot resulted in consistent and predictable travel times - where the slowest travel times during the afternoon commute were similar to the average travel times before the pilot.

When comparing December 2018 to before the pilot:

- The greatest improvement continues to be during the afternoon peak, where the slowest streetcar travel times have improved by approximately 4 - 5 minutes:
 - Eastbound travel times have improved from 25 minutes to 20 minutes
 - Westbound travel times have improved from 24 to 20 minutes.
- In the morning peak, travel times have stayed about the same (+/- a minute) even as morning peak period ridership has dramatically increased by 20% (which requires increased time for passenger boarding).
- Average streetcar travel times mid-day (10 a.m. – 4 p.m.) have improved by about 2.5 minutes eastbound and 2 minutes westbound in both November and December.
- Early evening (7–10 p.m.) trips have improved by about 2-2.5 minutes for both directions in both November and December.
- A key exception is that during late-evenings leading into the weekend (Thursday to Saturday 10 p.m. - 3 a.m.), while there is some improvement compared to before the pilot began, transit travel times are approximately 30% higher than the early evening time period, likely due to increased traffic congestion within the Entertainment District during this time.
- On average, over 30,000 minutes of travel time are saved by King streetcar customers every weekday.

During the morning peak period, the improvements were less pronounced than in the afternoon peak period. This is primarily attributed to the fact that morning peak period travel in the downtown is less congested than most other periods with less variable travel patterns. Comparatively, the afternoon peak period is more congested as work-based travel patterns overlap with other trip purposes which generates more traffic conflicts that result in delay.

Figure 2 illustrates the daily variability in transit travel times in the westbound direction during the afternoon peak period. Whereas prior to the pilot, trips were highly variable, observations during the pilot have become more tightly clustered, hovering between 15-20 minutes. Transit users are able to plan their trip more efficiently knowing how long their commute is going to take.

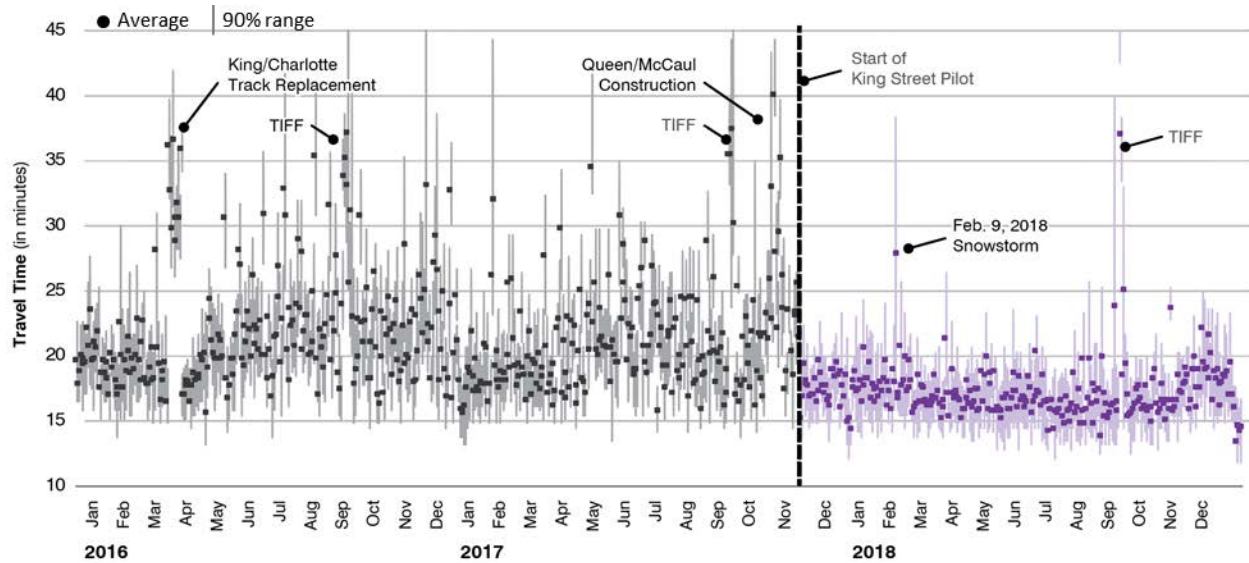


Figure 2. Daily Afternoon Peak Busiest Hour Pilot Area Travel Time Variability (Average and 90% Range). Westbound Jarvis St to Bathurst St, Weekday 5:00 pm to 6:00 pm

When transit riders describe the pilot’s benefit to travel time, the estimated time being saved is often greater than the overall average travel time change observed. Taking into account the reduced variability in travel, many customers are no longer experiencing the travel time extremes observed prior to the pilot. As Figure 2 above shows, travel times since the pilot began rarely exceed 20 minutes, whereas prior to the pilot, travel times were often exceeding 25 minutes, or longer.

Further detail on transit travel time and wait-time reliability are included in Attachment 2: Annual Dashboard Summary, Attachment 3: November - December 2018 Dashboard Update and Attachment 4: Transit Performance Summary.

Improved Efficiency and Reliability of Streetcar Operations

In general, the King Street Transit Pilot has resulted in more reliable, productive and efficient operation of streetcar service in the corridor.

- **Route Productivity**

A common measure for cost-efficiency and productivity of transit service is the number of customers per hour of service operated. Overall, TTC is one of the most productive transit agencies in North America, with approximately 85 boardings per hour of service.

TTC’s streetcar service is, in general, highly productive from a combination of high ridership through denser urban corridors and lower operating requirements from the higher capacity of the vehicles.

As outlined in Table 1, increased ridership during the pilot has increased route productivity by 25% to approximately 125 boardings per hour of service. Some of this gain is a result from the full deployment of low-floor streetcars on 504 King in

October 2018, where the higher capacity of the streetcars allowed for equivalent capacity to be operated with fewer service hours. Some of these hours are being reinvested in spring 2019 upon further analysis of ridership and travel times.

Table 1. Route Productivity of the King Streetcar Corridor

	Pre-Pilot October 2017	March 2018	October 2018
Daily Ridership	72,000	81,000	84,000
Scheduled Hours of Service	710	780	670
Boardings per Hour of Service	101	104	125

- On-Time Performance

The TTC defines on-time performance by departures at end terminals. An “on-time” departure is a vehicle that leaves no more than 1 minute early or 5 minutes late from its scheduled time.

Until the start of the pilot, the performance of the 504 King streetcar tracked closely with the on-time performance of all other streetcar routes. Upon the start of the pilot, on-time performance improved primarily due to reduced travel times and increased on-street supervision of the route, where TTC staff actively monitored and managed service to regulate vehicle spacing and respond to service disruptions. Schedule adjustments, were made in May 2018, June 2018, and October 2018 based on collected data to accommodate construction projects, the deployment of low-floor streetcars, and to align to pilot-period operating conditions.

Further detail regarding on-time performance is included in Attachment 4: Transit Performance Summary.

- Wait Time Reliability

Upon the start of the pilot, afternoon peak period performance improved significantly, with westbound and eastbound waiting time performance consistently above most pre-pilot levels.

In general, morning peak performance remained unchanged through the pilot period with some reduction in performance in the summer due to construction activities and late fall due to the change in route structure where the 504 and 514 were combined into one 504 route in October 2018 to enhance services in the central section of the Downtown Core.

Figure 3 shows the wait time reliability measure compared to the pre-pilot period on a monthly basis through the end of 2018.

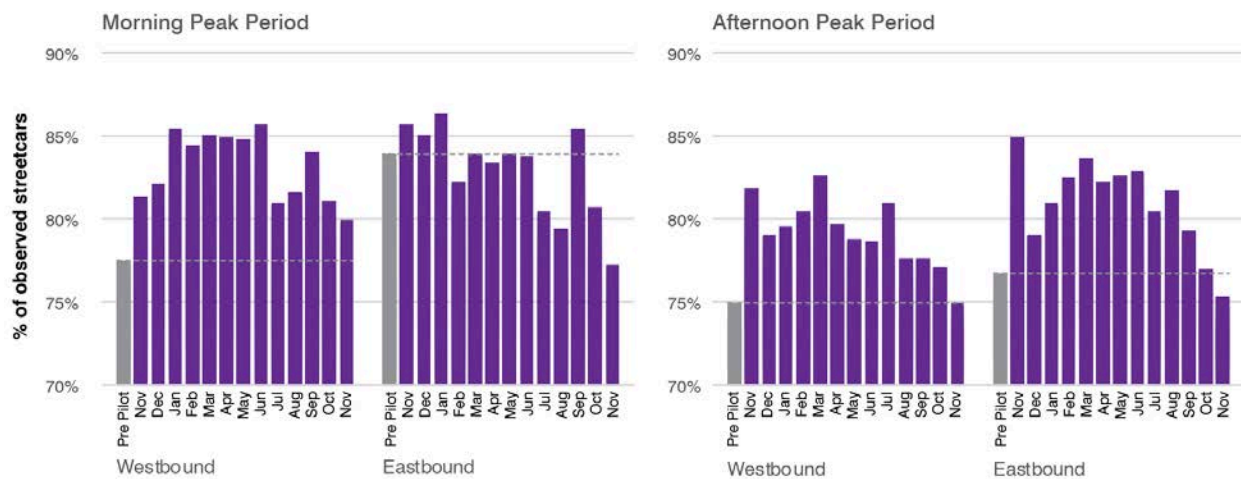


Figure 3. Wait Time Reliability - % of Streetcars Arriving Within 4 Minutes (Morning and Afternoon Peak Periods)

The measure selected for wait time reliability during the King Street Transit Pilot was the percentage of observed streetcars arriving within four minutes during peak periods. This measure was chosen based on the likelihood that a gap longer than four minutes in streetcars would result in a greater likelihood the next vehicle would become overcrowded. The four minute measure remained unchanged through the pilot, even after conversion of 504 King to low floor streetcars resulted in average scheduled morning peak headways being widened by 30% from 2 minutes 4 seconds to 2 minutes 38 seconds. This is consistent with other low-floor conversions to take advantage of the larger capacity of the new cars.

Further detail on wait-time reliability results are included in Attachment 2: Annual Dashboard Summary, Attachment 3: November - December 2018 Dashboard Update and Attachment 4: Transit Performance Summary.

More People Taking Transit in the King Street Corridor

Ridership on streetcars along King Street immediately increased upon the implementation of the pilot project in mid-November 2017. Increases were observed at all times of the day, including in off-peak periods and on weekends. The early consequence of the increased demand was crowding on streetcars and despite the introduction of low-floor streetcars and increased service, crowding remains a concern during the busiest periods of the day.

- Total All-Day Weekday Ridership

Weekday ridership has increased by nearly 17% between September 2017 and October 2018 to approximately 84,000 customers per day. The lower values observed in March and June are consistent with observed seasonal variation in ridership system-wide.

Table 2. Average Weekday Daily Ridership in King Street Corridor

Route-wide Weekday Totals for 504 King and 514 Cherry	Pre-Pilot (Sep 2017)	November 2017 (pilot)	March 2018	June 2018	October 2018
Daily Ridership (boarding)	72,000	84,000	81,000	80,000	84,000

- Weekday Ridership by Time Period

Ridership has increased during the morning peak period, midday and afternoon peak periods. During these periods, ridership has increased between 10% and 25%.

Early evening ridership fluctuates depending on time of year due to special events occurring in the Downtown. For example, the November 2017 count was taken during the Distillery District Christmas Market, while the slight decreases observed in March and June 2018 are likely a result of reduced ridership during the warmer months when some streetcar passengers walk or bike instead. Late evening ridership remains largely unchanged during the pilot period.

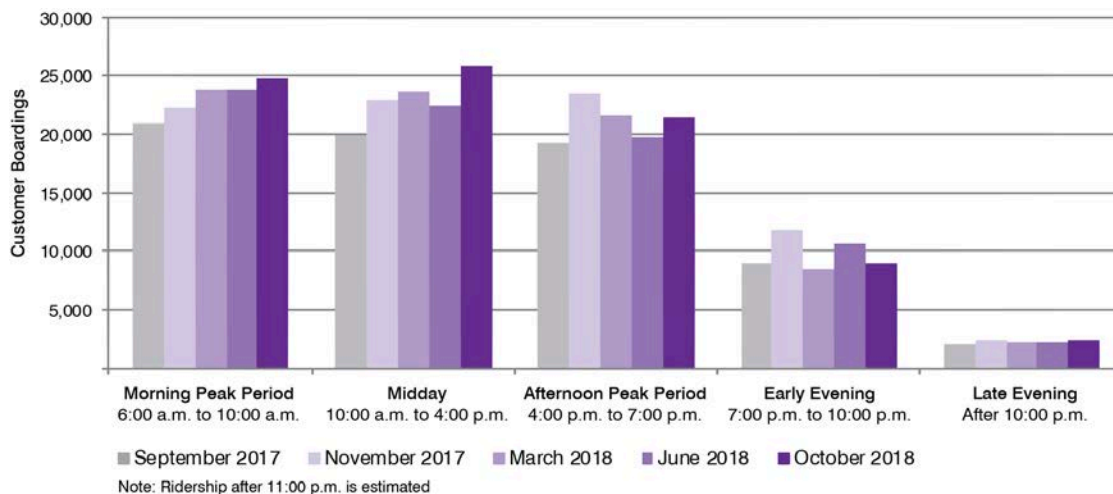


Figure 4. Weekday Ridership by Time Period - 504 King and 514 Cherry Streetcar

- Weekend Ridership

Weekend ridership has been estimated based on PRESTO taps and trends. Generally, weekend ridership has increased since the implementation of the pilot. In November 2017, an increase of approximately 16% was observed from September 2017. This can likely be attributed to the Distillery District Christmas Market and the Santa Claus Parade. A further sample in June 2018 showed an increase of 7% over pre-pilot levels.

A weekend estimate for October 2018 is unavailable due to the large growth in PRESTO penetration after the implementation of the two-hour time-based transfer in August 2018. Weekend ridership is highly variable on streetcar routes downtown – special events, road restrictions, and subway closures all have significant impacts on ridership on a week-over-week basis.

Further detail on ridership is included in Attachment 4: Transit Performance Summary.

- Responding to Passenger Demand with Increases in Streetcar Capacity

In October 2018, morning peak hour passengers demand increased by over 30% while the afternoon peak hour passenger demand increased by 45% from the September 2017 baseline. The peak point, peak hour demand is measured eastbound departing Spadina Avenue in the morning, while it is westbound approaching Spadina Avenue in the afternoon.

At the start of the pilot, the increase in peak passenger demand resulted in consistent overcrowding. Low-floor streetcars had been introduced on 514 Cherry in fall 2016 to provide increased capacity in the busiest section of the route, however, this was not sufficient to meet the new demand. To further respond to the increased passenger demand at peak times, low-floor streetcars were introduced on 504 King in early December 2017, with full deployment in late October 2018.

Since the start of the pilot, delivered streetcar capacity has increased from approximately 2,000 to 2,900 passengers per hour per direction in the morning peak. In the afternoon peak period, it has increased from approximately 1,600 to 2,400 passengers per hour. Despite this increase, overcrowding is still observed at the busiest times.

The deployment of the new low-floor, high-capacity streetcars on King Street, and the ability to reliably operate them closer together, has significantly increased the capacity of the corridor in order to respond to greater passenger demand. More passenger trips can be accommodated when passengers need and use the service most. The combination of improved reliability and additional capacity illustrates the amount of latent passenger demand on the corridor that was previously unserved.

Further measures to increase capacity will be explored, including adding more streetcars or reintroducing supplemental bus service at the busiest times. Further detail on passenger demand and delivered capacity are included in Attachment 2: Annual Dashboard Summary and Attachment 4: Transit Performance Summary.

Greater Customer Satisfaction with King Streetcar Service

The King Street Transit Pilot has improved customer satisfaction with transit service in the King Street corridor. In 2018, perceptions of trip duration, a key driver of overall customer satisfaction, averaged 88%, which is the highest of all streetcar routes.

Perceptions of crowding and wait time improved at the start of the pilot, which is reflective of a period when low-floor streetcars were replacing the legacy streetcars one-for-one, resulting in more capacity being operated.

Another measure tracked is “value for money”, which increased from 58% in the pre-pilot period in 2017 to 71% in 2018. Of all streetcar routes, the 504 King had the second highest “value for money” score in 2018, with only the 512 St Clair, which operates in its own right-of-way, performing better (72%).

These results are based on the quarterly Customer Satisfaction Survey conducted by the TTC to provide insight on perceptions of TTC service and operations.

Further detail on customer satisfaction is included in Attachment 4: Transit Performance Summary.

Overall Mobility of People and Goods on the Surrounding Road Network

While improved transit performance was critical to the success of the pilot, benefits realized on King Street cannot come at the expense of unreasonable negative impacts to the overall mobility of people and goods on the surrounding road network. This impact is assessed through:

- Car travel times,
 - Car volumes,
 - Pedestrian volumes, and
 - Cyclist volumes.
- Car Travel Times Are Generally the Same

Motor vehicle travel on streets in the Downtown Core have not been significantly impacted by the pilot. Average travel times, while showing some variability from month to month, have risen slightly (less than a minute) in both the morning and afternoon peak periods on east-west streets parallel to King Street. On north-south streets, travel times are largely the same.

Specific corridors experienced larger travel time increases during some months, but in most cases, the impact could be traced back to significant long-term construction projects. For example:

- Sections of Dundas Street between Bathurst Street and University Avenue were reduced to one lane in each direction in the fall of 2018 due to watermain replacement and road resurfacing work.
- Jarvis St. between Queen St. and Dundas St. experienced significant delays due to watermain replacement and road rehabilitation work in 2018 between July and December.

Further detail on car travel times are included in Attachment 2: Annual Dashboard Summary and Attachment 3: November - December 2018 Dashboard Update.

- Car Volumes Decreased on King Street and Increased on other Streets

As was expected, motor vehicle traffic volumes have decreased on King Street, while increasing somewhat through dispersal to parallel streets.

There have been modest increases in motor vehicle traffic volumes on Queen Street, Richmond Street, Adelaide Street, and Wellington Street. For example, screenline volumes at Bay Street have shown an average of 4.6% and 5.6% during the morning and afternoon peak periods, respectively. Traffic volumes on Front Street have remained largely unchanged. While volumes have increased on these streets, this has had a minimal impact on travel times during the peak periods, as noted above.

There has been an approximately 7% overall reduction in the total number of cars measured on all major corridors in the area surrounding King Street during the peak periods. This may indicate that some drivers have shifted their motor vehicle trips to off-peak and/or shifted to transit, walking or cycling.

Further detail on car volumes are included in Attachment 2: Annual Dashboard Summary and Attachment 3: November - December 2018 Dashboard Update.

- Pedestrian Volumes Remained Stable

Total pedestrian volumes have remained stable on King Street as a result of the pilot when accounting for the effects of seasonality, relative to comparable east-west streets, including Queen Street.

Pedestrian traffic is sensitive to trends in seasonality, especially at intersections along Bay Street where pedestrians can use the underground PATH as an alternative to the street network during colder weather.

Weekday all-day pedestrian volumes indicate that mid-day and evening volumes remain relatively high, with high pedestrian volumes continuing from 6 p.m. through to 10 p.m.

Evening volumes are about the same as pre-pilot baseline volumes.

Further detail on pedestrian volumes are included in Attachment 2: Annual Dashboard Summary and Attachment 3: November - December 2018 Dashboard Update.

- Cyclist Volumes Increased

King Street has attracted an increase in the number of people cycling along this corridor, likely because reduced motor vehicle volumes made it more comfortable to cycle.

While cycling volumes is highly sensitive to seasonality and weather conditions. For example, screenline volumes counted at Bay Street indicated an average of 22% of cycling traffic on downtown east-west corridors relative to the summer peak (July 2018) is still present in the winter months (January to March, December 2018).

A comparison of cycling volumes in October and November 2017 before the pilot was installed, with volumes from October and November 2018 showed significant increases in the number of cyclists along King Street at Bay Street of 157% and 189% in the morning and afternoon peak periods, respectively. During this same time period, decreases of 27% (in the morning peak) and 9% (in the afternoon peak) were observed in cycling traffic along corridors parallel to King Street, Eastbound cycling volumes along Adelaide Street were likely impacted by ongoing construction between Spadina Avenue and Yonge Street.

Bike Share Toronto reported significant ridership increases during the pilot period. Before the pilot, there were seven (7) bike share stations located in the pilot corridor. These stations saw a total of 74,383 rides in 2017. As part of the pilot, seven (7) new stations were added for a total of fourteen (14) stations along the corridor. In 2018, there was a total of 227,408 rides at these stations. This accounts for a 206% growth in bike share ridership along the pilot area.

Further detail on cyclist volumes are included in Attachment 2: Annual Dashboard Summary and Attachment 3: November - December 2018 Dashboard Update.

2. Support Business and Economic Prosperity

Toronto's Downtown connects Canada with the global economy and King Street plays a vital role in connecting people with their jobs, providing access to goods and services, and cultural and entertainment businesses.

King Street serves the largest concentration of jobs in the City, the majority of which are within the Financial District. King Street also serves some of the most dense and fastest growing residential neighbourhoods in the City. According to the 2016 Census, there were over 230,000 jobs and 30,000 residents within 500m of King Street, in the pilot area between Bathurst Street and Jarvis Street. Additional significant growth along the corridor is expected in the coming years.

The pilot sought to support business and economic prosperity through creating new opportunities to use curb lanes for deliveries, cultivating a vibrant pedestrian atmosphere, and enhancing public life through activations like public spaces and cafes.

The impact on business and economic prosperity is assessed through:

- Overall Mobility of Workforce,
- Customer Spending,
- Business License Turnover,
- Food is King Campaign, and
- Feedback from Businesses

More people are moving through downtown by all modes

Data shows that the total number of people moving east-west through the downtown core has increased by 3% during the morning and afternoon commutes, primarily as a result of increases in transit ridership. Total two-way person volumes at a screenline count of Spadina Avenue across all modes (motor vehicles, pedestrians, cyclists, and streetcar riders) rose from 80,600 to 83,200 during the peak periods, an increase of 3.2%, when comparing counts from fall 2017 before the pilot to fall 2018 after the pilot was installed.

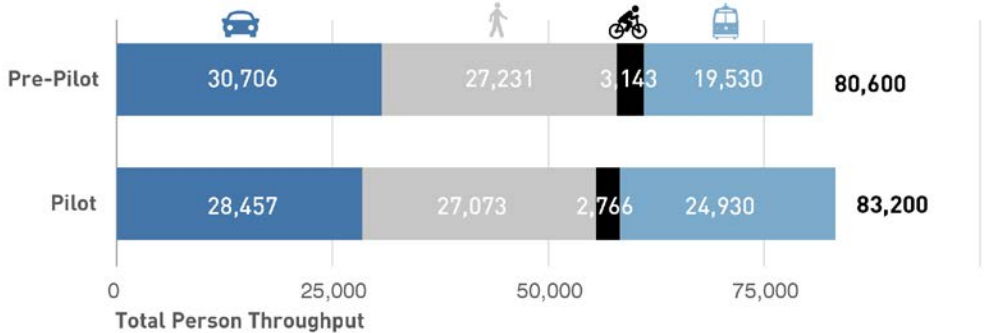


Figure 5. Total East-West Person Volumes across Spadina Ave from Queen Street West to Front Street West. All Modes, AM and PM Periods

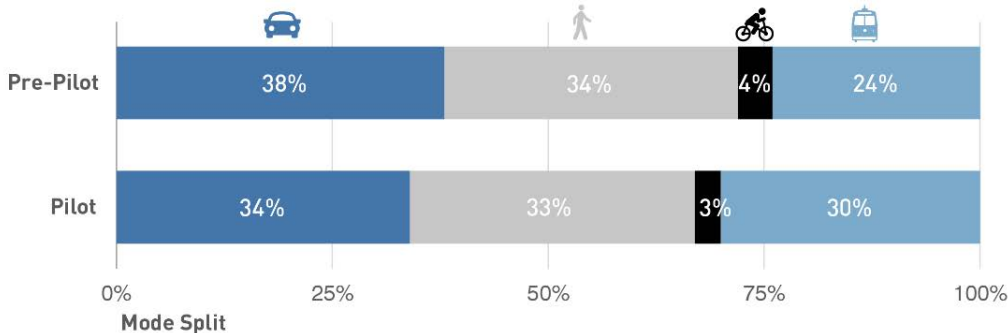


Figure 6. Total East-West Mode Split across Spadina Ave from Queen Street West to Front Street West, All Modes, AM and PM Peak Periods

Growth in Customer Spending has Marginally Decreased

In order to provide independent insight into customer spending at businesses during the pilot period, the City obtained aggregate transaction data from Moneris Solutions Corporation, the company with the largest market share of point-of-sale payment terminals in Canada.

Data was obtained from November 1, 2014 through December 31, 2018, represent approximately three (3) years of pre-pilot data, and one (1) year during the pilot duration.

The information represents customer spending indexed to November 2014, and is organized into three (3) comparison areas:

- on King Street, between Bathurst Street and Jarvis Street,
- the surrounding area (generally bounded by Ossington Ave. and Strachan Ave., College St., Jarvis St., and Lake Ontario); and
- the City as a whole.

For spending across all industries, comparing the year over year growth in the twelve (12) month period before the pilot and 12 months after the pilot was installed shows that:

- Year-over-year growth in total spending on King Street has decreased slightly from 2.5% before the pilot to 1.7% after the pilot was installed;
- Growth in total spending on King Street is lower than the surrounding areas and city-wide; and
- This is a trend that existed during the year before the pilot was installed, indicating that these differences may not have resulted from the pilot itself.

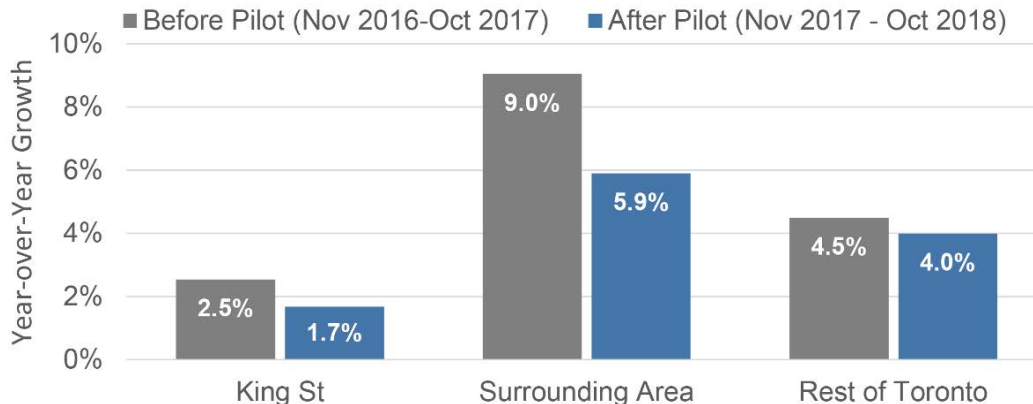


Figure 7. Year over Year Change in Total Customer Spending (All Industries)

For spending in restaurants, comparing the year-over-year growth in the 12 month period before the pilot and 12 months after the pilot was installed shows that:

- Restaurant spending appears to have decreased on King Street by 1.2%. and this decrease appears to have started in late 2017; and
- Restaurant sales also experienced lower growth in both the surrounding areas and city-wide after the pilot was installed, suggesting that the trend of lower growth cannot entirely be attributed to the pilot.

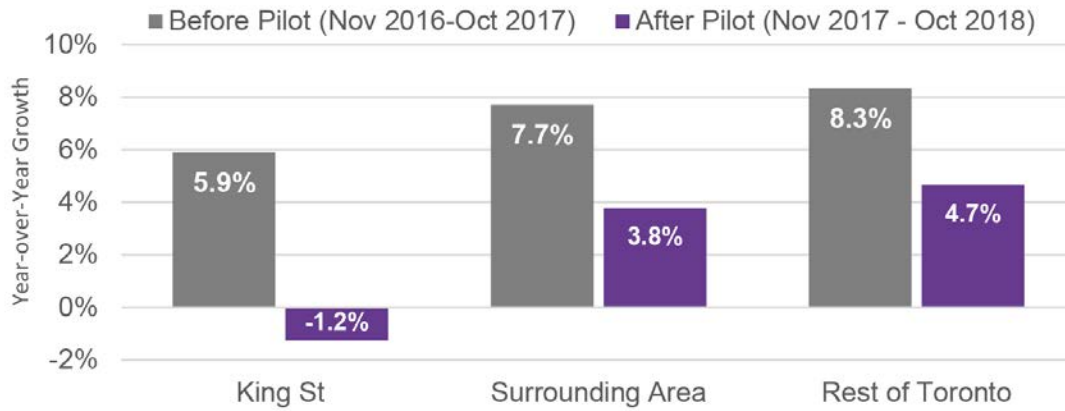


Figure 8. Year over Year Change in Customer Spending - Restaurants



Figure 9. Year over Year Change by Month in Customer Spending - Restaurants

Spending in both retail and services sectors appears to have grown faster during the year after the pilot was installed compared to the rate of growth in the year before the pilot began.

The growth in these sectors seems to offset the reduction in customer spending in restaurants to result in overall year over year growth that is about the same in the year before and after the pilot was installed.

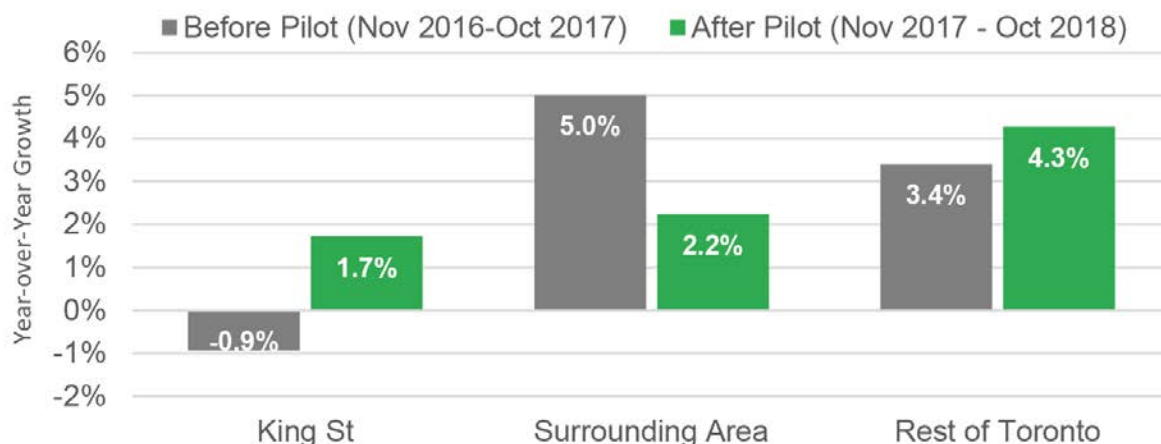


Figure 10. Year over Year Change in Customer Spending - Retail

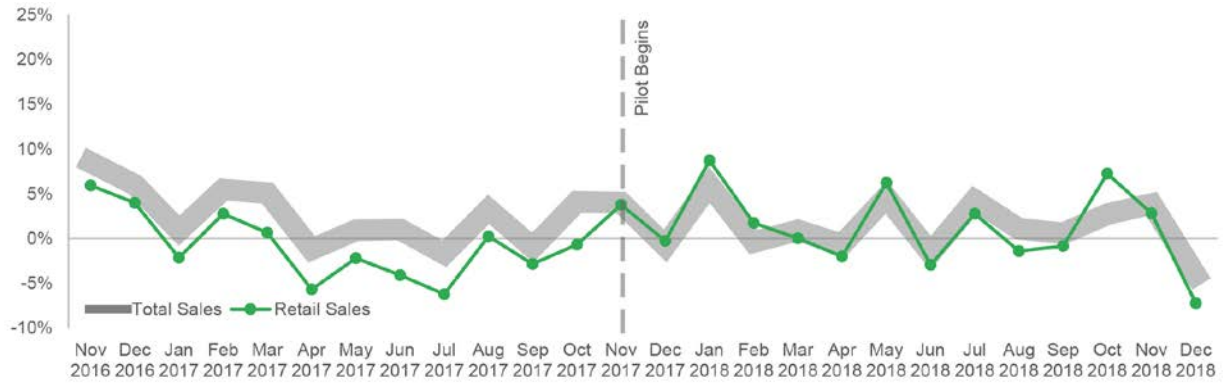


Figure 11. Year over Year Change by Month in Customer Spending - Retail

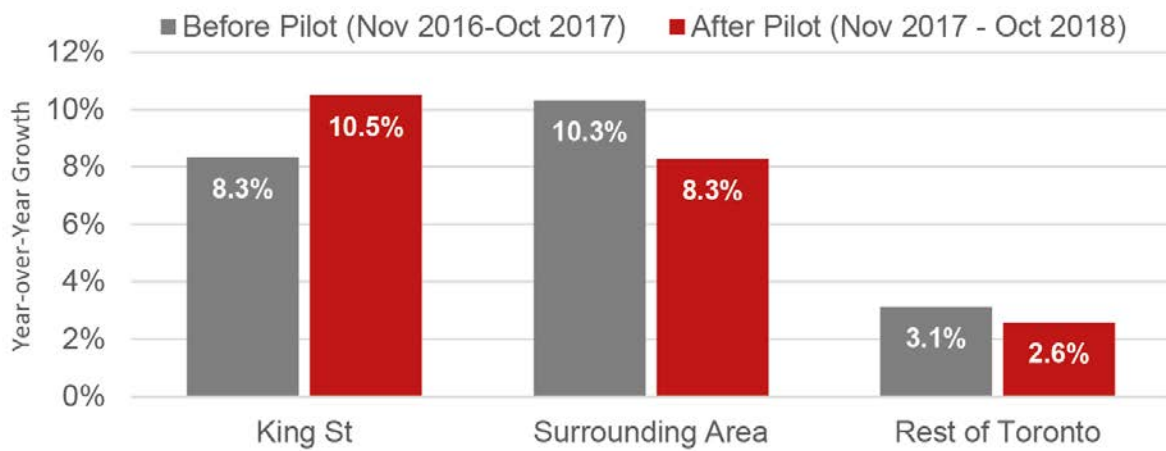


Figure 12. Year over Year Change in Customer Spending - Services

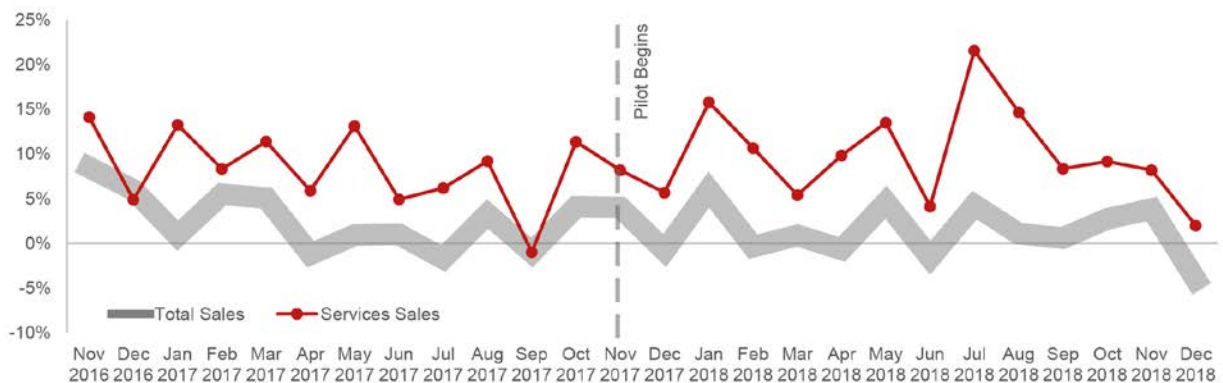


Figure 13. Year over Year Change by Month in Customer Spending - Services

Further detail on customer spending is included in Attachment 2: Annual Dashboard Summary.

Business License Turnover Is Lower than the Surrounding Area

Business license turnover rates were also reviewed as an indicator of the economic trends in the pilot area before and during the pilot duration, compared to city-wide trends. The businesses accounted for in this data are licensed eating establishments and retail food stores, i.e. restaurants, take-out food, convenience stores, etc.

The data showed that the rate of cancelled business licenses within the King Street pilot area increased marginally (1.5%) in 2018, the rate of cancelled business licenses within the King Street pilot area is consistently lower than the rate for the surrounding area and city-wide over the last three years.

The data is based on the number of cancelled licences against the total licences active for at least one day in the years 2016 to 2018.

Table 3. Business License Cancellation Rates Compared to City Wide

Year	King Street Transit Pilot Area	Surrounding Area	City Wide
2016	8.9%	17.3%	13.5%
2017	9.6%	15.3%	13.7%
2018	11.1%	13.9%	13.4%

It should be noted that there are several major active redevelopment projects underway along King Street in the pilot corridor that involved closures of the local businesses that previously operated on the sites during the process of redevelopment and/or construction.

Food is King Campaign Increased Sales

The Food is King promotional campaign achieved notable sales increases and new customers for participating restaurants and food establishments in the area.

The campaign, a partnership between the City of Toronto, the Toronto Association of Business Improvement Areas (TABIA) and the Toronto headquartered food ordering app Ritual, ran from February 20 through to March 4 and involved 52 participating restaurants along and around King Street West from Bathurst Street to Jarvis Street. The campaign provided a \$15 credit for food purchases by new Ritual users and existing Ritual users who had not placed an order at a participating King Street restaurant in 2018. This promotion resulted in a \$426,005 increase in sales for participating restaurants compared with the weekly average three weeks before the promotion.

Feedback from Businesses was Mixed

City staff liaised regularly with businesses and stakeholders along the corridor. Questions, comments, and concerns were heard and addressed through an open invitation for feedback through the project's dedicated email account. A regularly scheduled call-in meeting was held for stakeholders including the BIAs, industry representatives, and advocacy groups.

In January 2018, City staff disseminated a questionnaire to over 600 business owners and managers in the vicinity of the corridor. Questionnaires were emailed and hand delivered to businesses, and sent through the BIAs. The questionnaire requesting feedback and perceptions of the pilot. Staff received 66 responses from businesses within the corridor and 16 businesses outside the pilot area.

During the pilot and in response to the questionnaire, the City heard concerns from several businesses (mostly restaurants) who expressed that pilot conditions led to revenue loss. Concerned businesses identified challenges with customer access to their business, general confusion about the rules and regulations of the pilot, difficulty finding parking, and a decline in pedestrian activity. City staff continue to work with business owners to address localized concerns, such as availability of loading space and outdoor café space.

Other businesses have responded positively about the pilot and believed it had a neutral or positive impact on their revenue. These businesses highlighted how the pilot encourages transit use and pedestrian activity.

Business owners who said that they drive to King Street and believed most of their clients/customers also used their personal vehicles to access their business were more likely to identify a negative impact from the pilot conditions.

Overall, most businesses that provided feedback agreed that the pilot was successful at creating a more efficient and dependable transit system. However, many expressed the desire for a compromise scenario, where the pilot would be in effect for certain periods of the day.

Some businesses expressed the desire for increased investment in public realm initiatives to better reinforce King Street as a premiere destination for culture, heritage, entertainment, and retail.

The Financial District Business Improvement Area (FDBIA) represents an area where over 200,000 employees commute to work every day. The FDBIA conducted surveys regarding the pilot project with employees at member businesses (once pre-pilot and twice during the pilot) and received over 5000 responses. 23% of survey respondents indicated they commute to work on the King Streetcar. The FDBIA shared that their survey demonstrated that transit riders were very satisfied with the pilot and believed their commute times had decreased, while people commuting with personal vehicles were frustrated and felt their commute times had increased. The FDBIA identified that over 65% of workers in the district commute by GO Train or subway and were not impacted by the pilot.

3. Improve Public Space

Increasing and enhancing public space along King Street defined the third objective of the pilot.

The City partnered with Park People to conduct a study on public life and activity within the pilot area. The study was designed to identify how many people and who were using

a public space, and what people were doing in each public space. The study included two periods of behavioural observation in July and November 2018 to gain an understanding of public life on King Street.

A "stickiness" percentage was used to show how many people chose to spend time in a public space versus simply walk through. The stickiness of the pilot area showed that certain segments are performing as well or better than other parks or open spaces that were surveyed in 2016 as part of the TOCore planning study. Nearly one in five people counted spending time on King Street during the study were located in the new public spaces.

In particular, the new public and curb lane café spaces encouraged more people to stay along King Street. Nearly one in five people staying on King Street chose to do so within one of the new public spaces. The study also showed that three of the new curb lane cafés attracted approximately 30% of all use recorded in the new public space areas, indicating that some of the new cafés established by businesses were well-used. The study also revealed that the new curb lane public spaces at David Pecaut Square transformed the area into a more popular gathering place compared to the previous survey conducted in 2016.

4. Other Metrics Considered in the Pilot

Parking

Before the pilot, on-street parking on King Street was permitted in the curb lane in off-peak periods. While approximately 180 on-street parking spaces were removed from King Street as a result of the pilot, approximately 100 new on-street parking spaces have been added to side streets since the pilot began.

Access to off-street parking is maintained, with approximately 8,000 spaces within a 5-minute walking distance of King Street pilot area.

In mid-January 2018, the TPA began offering a parking promotion through the GreenP app to provide customers with a discount of up to \$10 off their parking in the pilot area. The promotion was valid for on-street parking within the pilot area as well as in pay and display off-street parking lots. This promotion has been used over 78,000 times through the end of December 2018, representing a value of approximately \$509,520. On average, the discount code was used 6,572 times per month at an average cost per use of \$6.46, resulting in a monthly impact of \$42,460 for the TPA.

Total on-street parking revenue in the pilot area during the year when the parking promotion was in effect (from February 2018 to January 31, 2019) was approximately \$12.8 million. Pay and display off-street parking generated approximately \$2.4 million in this time period.

As a comparison, total on-street parking revenue in this area in the year before the pilot (November 1 2016 –November 1 2017) was approximately \$9.9 million. Pay and display off-street parking generated approximately \$2.6 million in this time period.

Curbside Utilization

Parking and loading activities were observed in February 2017 through a curbside utilization survey which informed the initial King Street pilot design. In October and November 2018, a second curbside activity survey was undertaken, informing the current proposed concept plan.

The data was used to identify changes to the length or purpose of some curbside uses to support the accommodation of requests from local businesses and BIAs and affirmed staff observations of frequently-used loading and taxi spaces in the King West and in the Financial District areas.

Compliance and Enforcement

Transportation Services worked closely with the Toronto Police Service on strategies to address compliance with the pilot's traffic regulations through effective education and enforcement. When the pilot was first launched in November 2017, the compliance approach focused initially on education and warnings, followed soon after by traffic enforcement. At various points during the pilot, the Toronto Police undertook traffic enforcement blitzes in the pilot area.

During the pilot monitoring period, a total of 9,787 ticketed violations were issued in the pilot area by the Toronto Police in the following categories:

- 8,816 tickets under Section 144 - Proceed Contrary to Sign at Intersection
- 971 tickets under Section 182 - Disobey Sign

Compliance data was compiled based on video analytics and manual review of intersection cameras. Transportation Services shared compliance data with the Toronto Police to assist with targeting enforcement efforts.

Compliance for general traffic was found to be worst during the late-night periods when licensed taxicabs are exempt from through-movement prohibitions in the King Street Transit Pilot area. On a typical late-night leading into the weekend, the number of violations per hour is approximately 3 times higher than the rate for non-exempt period (Thursday to Saturday 10 p.m. -3 a.m.).

It is apparent from observations that other vehicles (particularly ride-hailing service vehicles that are not exempt during this time) are following taxis proceeding through restricted intersections.

Feedback from local businesses and Toronto Police Services indicates that during the late-evenings leading into the weekend (Thursday to Saturday), there continue to be safety concerns associated with a lack of dispersal of patrons from King Street, with people loitering downtown. This is a condition that existed along King Street West prior to the pilot being implemented.

On the basis of these findings and the impact on transit service demonstrated in the late-night period, this report recommends that the late-night performance of the King Street Transit Priority Corridor be further monitored and assessed, particularly within the Entertainment District, to inform the consideration of changes that could improve transit

performance while ensuring for the safe and effective dissipation of people from nightlife activity on King Street West.

Going forward, it is proposed that compliance and enforcement can be addressed through improved and illuminated signage such as LED blank-out signs at key intersections to better inform motorists of traffic restrictions, occasional traffic enforcement blitzes, use of traffic wardens at key locations, and the future introduction of automated enforcement methods as they become available.

Emergency Response Times

Toronto Fire Services provided a comparison of emergency response times to assess if the changes to King Street Transit Pilot area have impacted their operations in the Downtown Core.

Although there has been a notable increase in the average number of daily emergency events during this time period, the percentage of responses meeting the 4-minute benchmark by Toronto Fire Services has improved by 0.3% during the pilot. As well, the 90th percentile range of travel time has stayed the same. Toronto Fire Services has indicated that the number of emergency events were found to be higher in 2018 city-wide, primarily as a result of an increased number of extreme weather events, such as wind storms, requiring emergency response.

The response zone encompasses the area served by Station 332 between Bathurst Street and Jarvis Street in the east and west boundary, and Dundas Street and Front Street in the north and south boundary. Pre-pilot data was reported between September 23, 2016 and November 11, 2017. Pilot data was reported between November 12, 2017 and December 31, 2018.

Table 4. Comparison of Emergency Response Times

	Total Emergency Events	Daily Average Events	% Responses Under 4 Minutes	90th Percentile Travel Time (in minutes)
Pre-Pilot	7,107	17	91.6	3:51
Pilot	8,359	20	91.9	3:51

Mobility and Environmental Perception

A study conducted by Ryerson University, in collaboration with Toronto Public Health, found that 7% of King streetcar users surveyed switched from driving to taking the 504 King streetcar, and 29% switched from another TTC route since the pilot started. TTC ridership data indicates that demand on other streetcar routes has not decreased; therefore, it is possible that capacity "freed up" by shifting riders was absorbed by latent demand on other routes.

The study was conducted as an intercept and online survey from October 1-15 2018, and included 521 participants. People on public transit, walking, and cycling were intercepted along King Street to participate in the survey, while others participated online. Equal numbers of males and females participated in the survey. The majority (51%) were ages 25-44 and a large proportion self-reported very good to excellent levels of health (77%). The survey focused on perceptions of the impacts the changes to King Street had on active transportation, travel time, travel mode, safety, and user experience.

In terms of perception of safety of vulnerable road users, 56% of transit users, 54% of pedestrians, and 68% of cyclists reported they felt safer using King Street during the Pilot. Overall, 73% of transit users, 59% of pedestrians, and 83% of cyclists surveyed strongly agree that their lived experience of King Street has improved during the pilot.

Air Quality

In a study led by the University of Toronto, it was found that there was some improvement to air quality on King Street during the pilot project, and no overall degradation.

With measurements taken in November 2017 before the pilot, and then in January and June 2018, levels of black carbon were found to decrease by approximately 50 percent in the morning peak hour. Before the pilot, levels on King Street were 2.5 times higher than at a comparable site on College Street, and were lower after.

Changes in average nitric oxide (NO) levels were found not to be statistically significant. Findings on nitrogen dioxide (NO₂) levels at 22 intersections throughout the pilot area were inconclusive.

Noise Levels

In a study undertaken by Ryerson University, noise levels were found to decrease on King Street and in the immediate area, after the introduction of the pilot, likely as a result of reduced traffic volumes. Measurements were taken in November 2017 before the Pilot (baseline) and twice during the pilot (February and June 2018) from Bathurst Street to Jarvis Street and Adelaide Street to Wellington Street. Noise levels were measured continuously for a one-week period, with a sampling frequency of 1 Hz. The four measurement campaigns included monitoring sites on King Street and the surrounding neighbourhood at intersections and mid-block locations.

The most significant change was that noise levels in the Entertainment District near King Street and Duncan Street decreased by 5.8 dB for 24-hour and 6.7 dB for nighttime periods. For context, a 10 dB higher noise level is perceived as a doubling in loudness.

As a comparison, between Church Street and Jarvis Street noise levels decreased by 1.6 dB for 24-hour and 2.4 dB for nighttime periods. East of Bay Street, noise levels decreased by 1.1 dB for 24-hour and 2.4 dB for nighttime periods.

Table 5. King Street Transit Pilot Neighbourhood Noise Levels

Area	Baseline (24-hour period)	Pilot (24-hour period)	Baseline (Nighttime: 11pm - 7 am)	Pilot (Nighttime: 11pm - 7 am)
Pilot Area	71.4 dB	70.1 dB	69.1 dB	68.5 dB

Next Steps

From early planning stages through design and implementation, City Planning and Transportation Services staff worked closely with TTC staff to make the King Street Transit Pilot a reality. The alignment of common goals for mobility, land use, and placemaking created a stronger coalition to advance the project than if the respective priorities were presented individually. The King Street Transit Pilot has provided a framework on which future projects could proceed.

Near Term Improvements

If the King Street Transit Pilot is made permanent, there are near-term improvements that would be made to the current design to enhance transit operations and placemaking along King Street. TTC and City staff will work together to implement some of these changes, including:

- Improved customer experience at TTC stops such as, transit shelters and real-time information displays, where possible, as well as by investigating the potential for modular raised stop platforms;
- Higher quality public realm activation for the curb lane public spaces, including more investment in attractive and durable seating, parklets, public art, enhanced lighting, wayfinding, and seasonal programming;
- Improved and illuminated signage such as LED blank-out signs at key intersections to better inform motorists of traffic restrictions;
- Investigating opportunities to optimize operations at both ends of the pilot, such as a potential amendment to the westbound through-movement restriction at Bathurst Street, to allow traffic leaving the pilot area in the westbound direction to continue along King Street, rather than turning right at Bathurst; and
- Further measures to increase capacity will be explored, including adding more streetcars or reintroducing supplemental bus service at the busiest times.

A concept plan for future curb lane uses has been developed and is included as Attachment 1, General Arrangement of King Street. The plan proposes a balanced mix of curb lane uses that reflects local business and community needs. Fourteen (14) businesses have expressed interest in operating a curb lane café this summer. The plan was developed based on feedback from businesses and stakeholders throughout the pilot duration. Business owners were also asked to state their preferences for curb lane use adjacent to their property as part of the questionnaire distributed in January 2019. A draft plan was circulated to storefront businesses to elicit

further feedback in February 2019. The by-law amendments required to implement this layout would be submitted directly to Council for approval.

Once established, future changes to the curb lane uses, such as a new curb lane café or changes to loading zones, that may be proposed from time to time going forward would require approvals in accordance with the process approved by Council in March 2019 for the Harmonized By-law and Fees for Sidewalk Cafés, Parklets and Marketing Displays.

Proposal to Modify the Pilot during Evenings and Weekends

A change to the hours of the day or days of the week in which the pilot is in effect has been proposed by some local businesses. This proposal has been carefully considered, and is not recommended for several reasons:

- Transit ridership continues to be high in off-peak periods, and negative impacts on transit travel times have been observed during the overnight taxi exemption period.
 - Between 7:00 p.m. and 10:00 p.m. and between 10:00 p.m. and 1:30 a.m., streetcar service remains very frequent, scheduled to operate every 5 minutes or better.
 - Approximately 9,000 customers use the 504 King streetcar service between 7:00 p.m. and 10 p.m. daily and approximately 2,400 customers use the 504 King streetcar service after 10:00 p.m. daily.
- The current configuration of King Street, which provides for 24-hour uses in the curb lane, with physical elements such as far-side streetcar stops and cafés, would not be compatible with the pilot through-traffic restriction being lifted for time periods when there are high volumes of traffic. There would be serious safety concerns with introducing significant volumes of traffic merging around far-side streetcar stops at intersections.

Recommendation to Study the Late Night Exemption Period

Some local businesses had proposed changes to the late-night operations of the pilot. Feedback from local businesses and residents indicates that during the late-night times, there is a lack of dispersal of patrons from King Street.

On the basis of this feedback, and analysis of data collected on this issue related to lack of compliance with the traffic regulations by general traffic in the late-night period, this report recommends that the late-night performance of the King Street Transit Priority Corridor be further monitored and assessed, particularly within the Entertainment District and King West, to inform the consideration of changes that could improve transit performance while ensuring for the safe and effective dissipation of people from nightlife activity on King Street West.

Future Improvements

As a longer term strategy, it is proposed that the existing temporary elements of the pilot design be replaced with permanently constructed elements such as bump-outs for transit stops, as well as widened sidewalks and public realm spaces, in coordination with future construction projects.

The TTC plans to reconstruct streetcar tracks on King Street between Close Avenue and Berkeley Street in stages beginning in the next 4 to 5 years. In addition, as private redevelopment continues to take place along this section of King Street, staff will explore opportunities to improve the streetscape in coordination with those projects.

Staff will also take into consideration the goals of the Downtown Parks and Public Realm Plan as well the Downtown Mobility Strategy, adopted by City Council in May 2018, and will work with the community and stakeholders such as local BIAs in developing a unified streetscape plan that responds to and enhances King Street's distinct character.

Recommendations for Other Projects

The King Street Transit Pilot demonstrated that cooperation between City Planning, Transportation Services and the TTC is essential for the success of future transit projects.

Earlier this year, City Planning, Transportation Services and the TTC have jointly initiated the development of a Surface Transit Network Plan which will identify various transit priority measures for implementation on surface transit corridors identified in Map 5 of the Official Plan as well as on other major transit corridors across the City.

In addition, the TTC in coordination with City Planning and Transportation Services is currently undertaking a 5-Year Service Plan and 10-Year Outlook. As part of this study, the TTC will identify other transit service and infrastructure enhancements to be implemented in the near and medium-term throughout the City.

City Planning is also continuing to partner with several City Divisions and Agencies, including Transportation Services and the TTC, on advancing and aligning initiatives related to the recently adopted TOcore Downtown Secondary Plan and supporting infrastructure strategies, in particular, the Downtown Parks & Public Realm Plan and the Downtown Mobility Strategy.

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ATTACHMENTS

Attachment 1: General Arrangement of King Street
Attachment 2: Annual Dashboard Summary
Attachment 3: November - December 2018 Dashboard Update
Attachment 4: Transit Performance Summary
Attachment 5: Public Realm Initiatives Summary
Attachment 6: Consultation Summary

APPENDIX 4: Transit Performance Summary

1. Evaluation Framework

The framework to assess the King Street Transit Pilot was outlined in the October 16, 2017 TTC Board report entitled, “King Street Pilot: Monitoring and Evaluation”. From a transit perspective, the success of the pilot is defined by improvements to transit performance informed primarily by three metrics: reliability, ridership and travel times.

- **Reliability:** The reliability of transit service is defined by the variability of a customer’s experience. This can be measured by their time spent waiting for service and/or on board the vehicle. The more variable a customer’s time either waiting for service and the more variable a customer’s time spent travelling onboard the vehicle between locations, the more unreliable the transit service is.
- **Ridership:** The two key measures of ridership are related to daily boardings and peak point, busiest hour demand. Daily boardings represent the total all-day number of customers using the service regardless of location and time. A customer is counted towards this metric when they board a transit vehicle. The second metric, peak point, peak hour demand, is the total number of customers passing through the busiest segment of the route during the busiest hour.
- **Travel times:** The travel time for streetcars varies based on vehicle type, traffic conditions, crowding levels, and level of transit priority given. In mixed-traffic situations, streetcar travel times are generally longer and more variable than in a semi-dedicated or dedicated right-of-way.

2. Success of the King Street Transit Pilot

a) Predictable and improved transit journeys

The most significant improvement to transit on King Street is that streetcar journeys are not only faster, but more predictable. Predictable transit service results in tangible benefits for customers who now can budget less travel time to complete their journeys because they don’t need to account for variability. This means that customers can board a streetcar with more confidence that they will arrive to their destination by a certain time. Without the pilot, particularly in the most congested times, transit travel times were highly variable.

Average travel times reduced during all time periods with significantly reduced variability

Figure 1 shows peak period average and 90% range travel times within the pilot zone on a monthly basis compared to the previous year. This year-over-year comparison allows for better understanding of how seasonal changes impact travel times and demonstrates that the pilot resulted in consistent and predictable travel times. The greatest benefit of the pilot was observed during the summer months. Compared to

summer 2017, the *longest* observed streetcar travel times on King Street in the afternoon peak period were lower than the previous year's *average*.

Figure 1 also shows that the pilot was beneficial, overall, in the morning peak period and afternoon peak period. During the morning peak period, the improvements were less pronounced than in the afternoon peak period. This is attributed to three primary reasons:

- Morning peak period travel in the downtown is less congested than most other periods resulting from less variable travel patterns. Comparatively, the afternoon peak period is more congested as work-based travel patterns overlap with other trip purposes which generates more traffic conflicts that result in delay.
- Transit signal priority in the pilot area was temporarily disabled at the start of the project to observe the impact of the pilot on overall traffic patterns. Significant improvement in travel times was observed upon reactivation of transit signal priority in July 2018.
- Increased customer demand at the start of the pilot project resulted in more crowded vehicles and longer dwell times at stops, particularly with the smaller CLRV streetcars. Consequent improvements to service capacity through the deployment of low-floor streetcars resulted in improved travel times.
- Overall, on average, customers on King streetcars are saving approximately 30,000 minutes in travel time per day, creating an economic benefit of \$2.7 million per year.

Travel times were also affected starting in October 2018 due to the change in route structure of the 504 King route. Schedule deficiencies coupled with customer adjustment to changes resulted in slower journey times, compared to the start of the pilot project. Improvements to the schedule in spring 2019 will address these issues.

Greatest improvements observed during the afternoon peak period

Figure 2 shows the daily variability in travel times in the westbound direction during the busiest hour in the afternoon peak period. The chart includes data from the start of 2016 to the end of 2018, illustrating the clear impact of the King Street Pilot. Whereas prior to the pilot project travel was highly variable, observations since the pilot began are tightly clustered within a range between 15 and 20 minutes.

When customers describe the pilot's benefit to travel time, the estimated time being saved is often greater than the overall average travel time change observed. Taking into account the reduced variability in travel, many customers are no longer experiencing the travel time extremes observed prior to the pilot. As Figure 2 shows, travel times since the pilot rarely exceed 20 minutes, whereas prior to the pilot, travel times were regularly exceeding 25 minutes.

Figure 1: Monthly Pilot Area Travel Time – Peak Periods

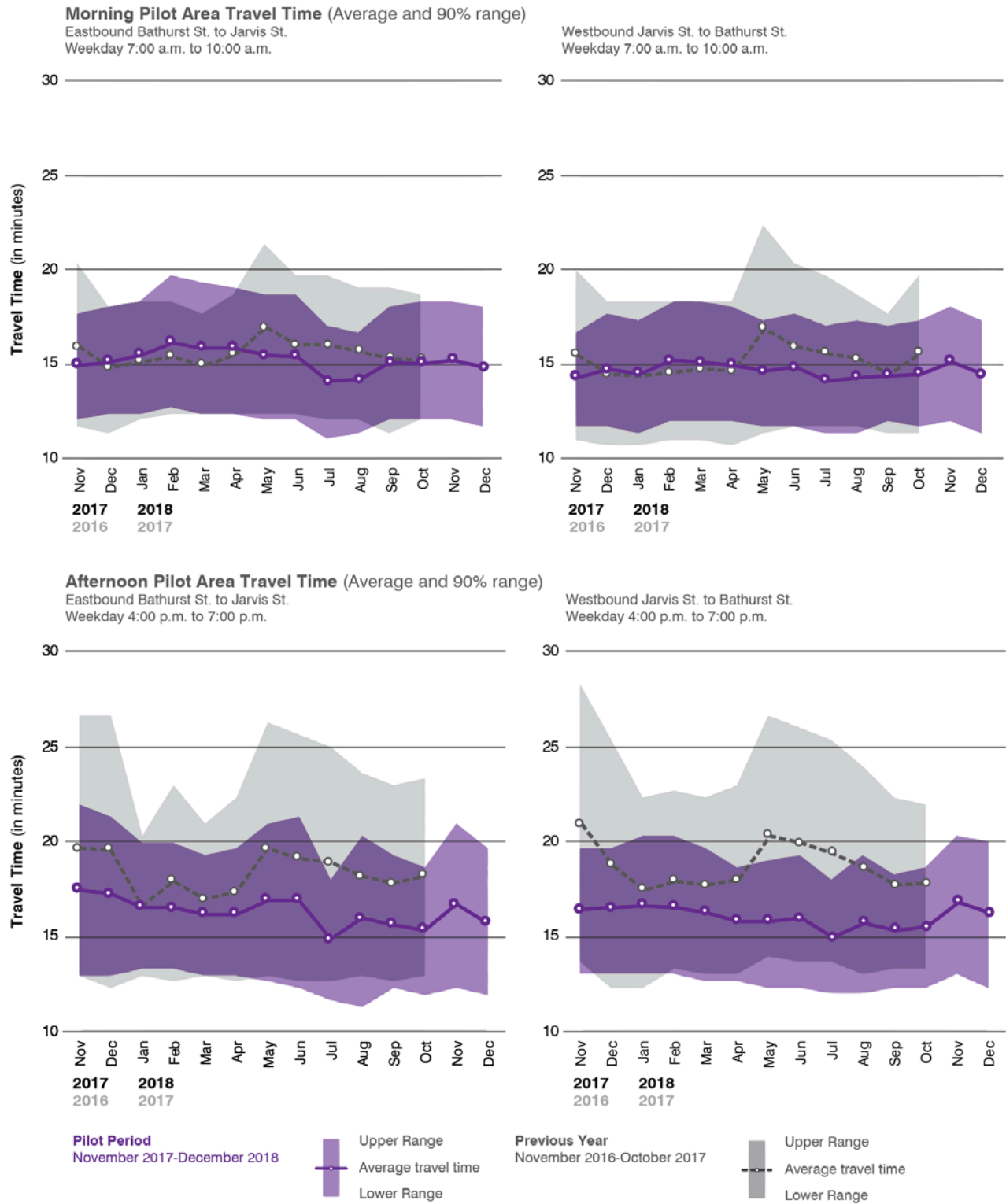
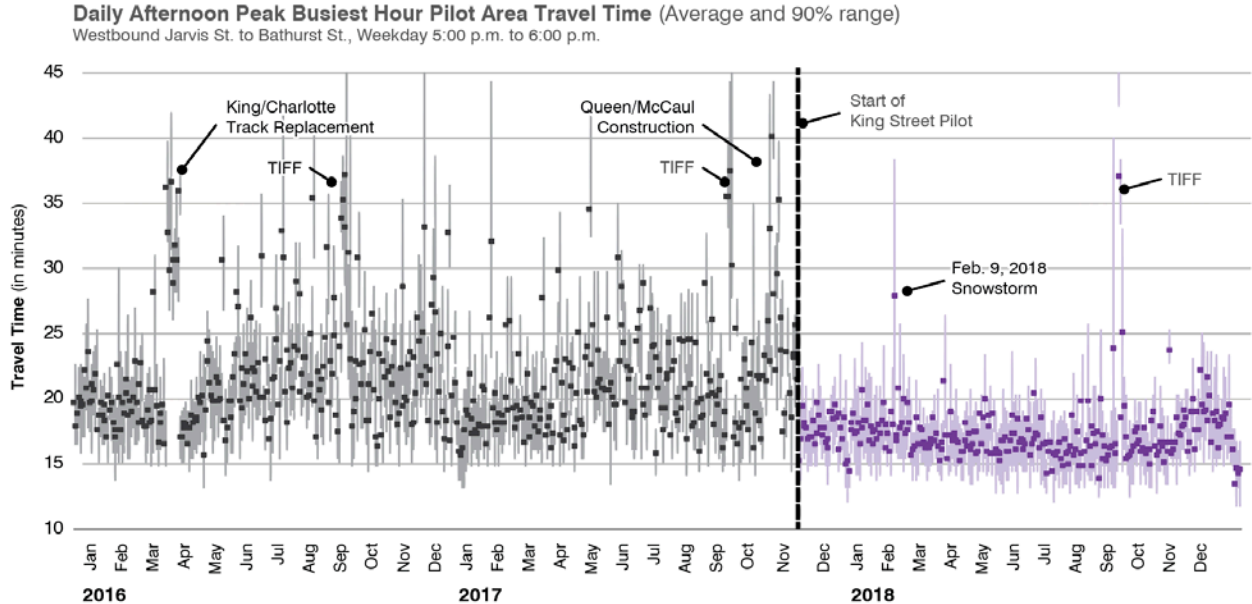


Figure 2: Daily Pilot Area Travel Time – Afternoon Busiest Hour/Direction



Late evening taxi exemption contributes to continued variability in streetcar travel times

One of the conditions for the approval of the King Street Transit Pilot was to exempt taxis from through-traffic restrictions between 10:00 p.m. and 5:00 a.m. daily. Between 10:00 p.m. and 1:30 a.m., streetcar service remains very frequent, scheduled to operate every 5 minutes within the pilot. However, customers and operators observe that travel times in the late evening, particularly on weekends, remain unpredictable and lengthy.

Figure 3 shows the impact of relaxed traffic restrictions, which results in more vehicular traffic on King Street. After 10:00 p.m., two-way through vehicular traffic increases between 100% to 300% at Bathurst and at Spadina, compared to early evening hours. Observations from operators and route supervisors indicate that most of the increased traffic volumes are taxis and ride share vehicles (ride share vehicles are not exempt from traffic restrictions).

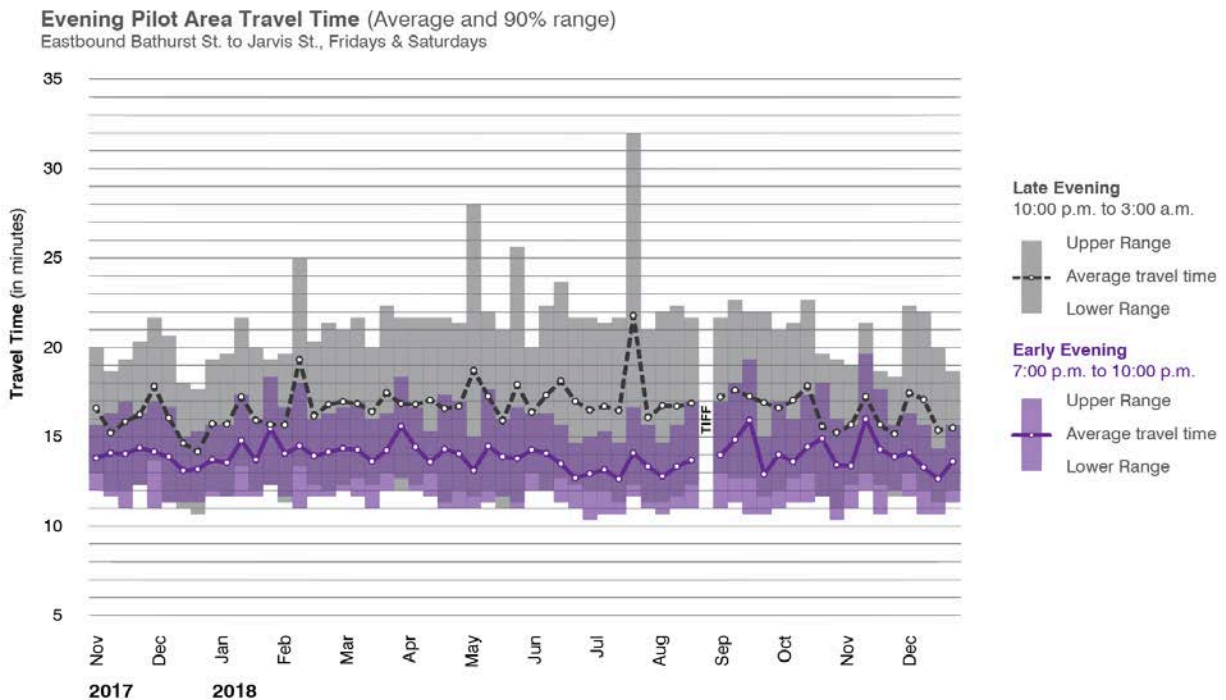
Figure 4 illustrates the impact of this increased traffic on streetcar travel times. It shows weekend travel times during the early evening (in purple) and late evening (in gray) on a weekly basis through the pilot. While there is overall improvement compared to before the pilot began, the late evening travel times are approximately 30% higher than in the early evening.

Figure 3: Average Two-Way Through Volumes

	Friday			Saturday		
	9:00 p.m.	10:00p.m.	11:00 p.m.	9:00 p.m.	10:00p.m.	11:00 p.m.
King/Bathurst	120	280	280	110	260	270
King/Spadina	120	390	400	130	390	370

Data from January to April 2018

Figure 4: Pilot Area Travel Time – Weekend Evenings



Approximately 2,400 customers use the 504 King streetcar service after 10:00 p.m. daily. While not all customers are travelling through the pilot area, the unpredictability of travel conditions during the late evening impacts service on the entire route. This negatively impacts the attractiveness of transit service on King Street and travellers are more likely to use other services such as taxis and ride shares. Ridership counts during the pilot showed little growth during the late evening compared to other periods of the day. Therefore, TTC staff recommend that the City further monitor late night performance, particularly through the Entertainment District and King West, to inform potential future changes to traffic restrictions.

b) Improved efficiency and reliability of streetcar operations

In general, the King Street Transit Pilot has resulted in more reliable, productive and efficient operation of streetcar service in the corridor. This results primarily from reduced travel time variability.

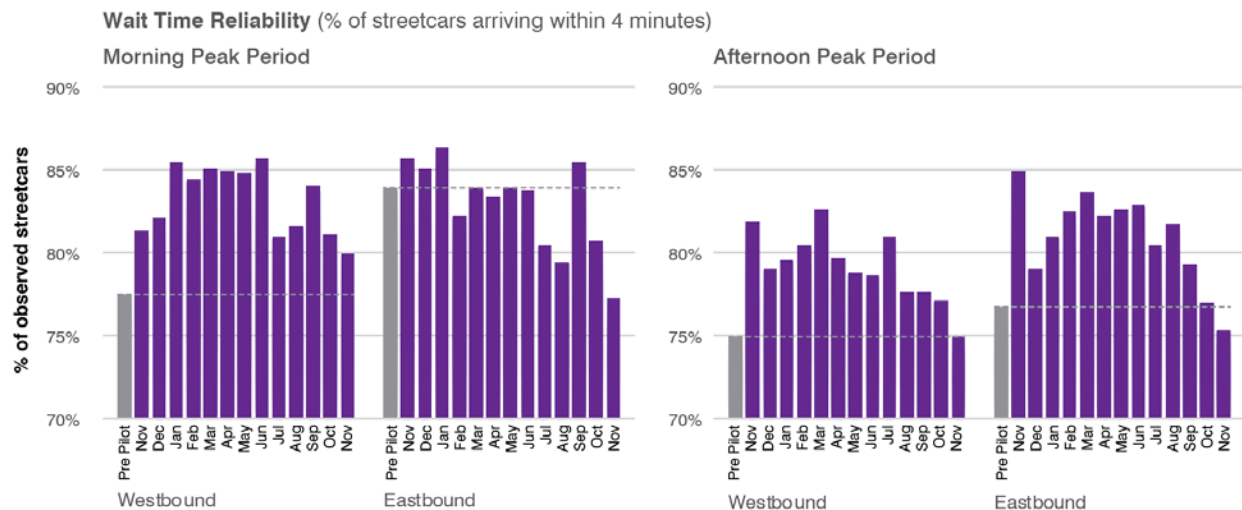
Streetcars generally arrive within 4 minutes during peak periods on King Street

The measure selected for wait time reliability during the King Street Pilot was the percentage of observed streetcars arriving within 4 minutes during peak periods. This was chosen based on the likelihood that a gap longer than four minutes in streetcars would result in a greater likelihood the next vehicle would become overcrowded. The four-minute measure remained unchanged through the pilot, even though scheduled peak headways were widened by 25% to 30% to reflect the higher capacity of low-floor streetcars on the 504 King route starting in the summer of 2018.

Figure 5 shows the waiting time reliability measure compared to the pre-pilot period on a monthly basis through the end of 2018. In general, morning peak performance remained generally unchanged through the pilot period with some reduction in performance in the summer due to construction and late fall due to the change in route structure.

Afternoon peak period performance did significantly improve upon the start of the pilot, with westbound waiting time performance consistently above pre-pilot levels.

Figure 5: Wait Time Reliability



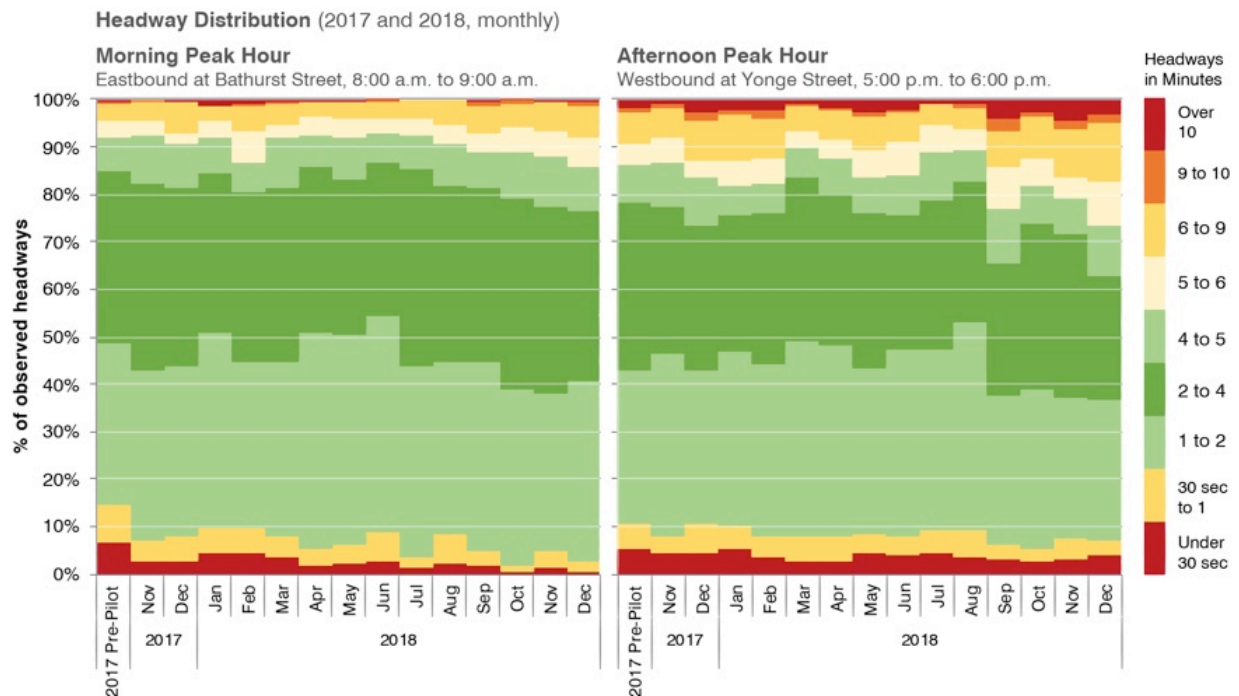
Data indicates that bunching of streetcars has reduced

To measure whether or not the pilot has improved the regularity of streetcars during the busiest times, all observed headways are plotted in Figure 6 on a monthly basis from the start of the pilot through the end of 2018. This graph shows an acceptable range (in dark green) of headways between 2 and 4 minutes as well as bunching and gapping (in dark red) of headways of less than 30 seconds or in excess of 10 minutes.

During the morning peak hour, bunching of streetcars has improved through the pilot year. Substantial improvement is observed starting in July 2018, when a new transit signal priority algorithm was implemented to help space out streetcars entering and within the pilot area. Through the pilot period, the incidence of long gaps over 10 minutes was rare, averaging less than 1%.

The afternoon peak hour showed some improvement mid-way through the pilot, when the proportion of streetcars arriving within 5 minutes increased above the pre-pilot average. The proportion of streetcars observed bunching at Yonge Street decreased slightly but remained around 2% of observed trips. This is expected at this stop due to the connection to Line 1, which sees higher customer volumes and dwell times makes it more likely for a following streetcar to arrive before the first leaves. An increase in the proportion of longer waits beyond 5 minutes is observed starting in September 2018. This is primarily due to challenges with route management unrelated to the pilot, resulting in a higher number of service adjustments that affect headway regularity.

Figure 6: Headway Distribution



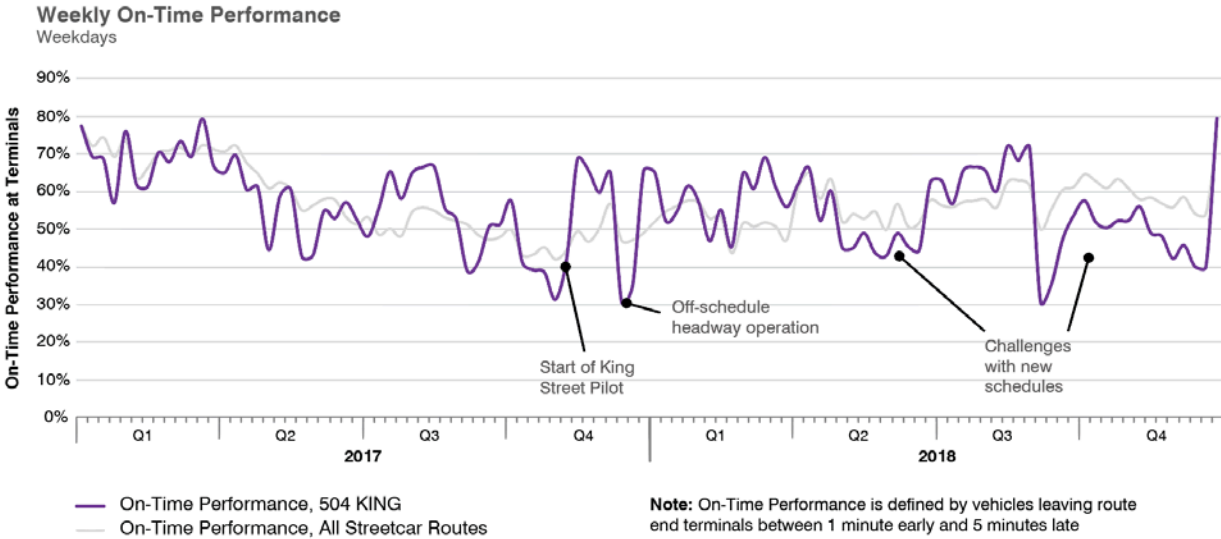
On-time performance on King improved relative to other streetcar routes

TTC defines on-time performance by departures at end terminals. An “on-time” departure is a vehicle that leaves no more than 1 minute early or 5 minutes late from its scheduled time. Figure 7 illustrates the weekly on-time performance of the 504 King streetcar compared to all streetcar routes from 2017 to the end of 2018.

Until the start of the pilot, the performance of the 504 King streetcar tracked closely with the on-time performance of all other streetcar routes. Upon the start of the pilot, on-time performance improved primarily due to reduced travel times and increased route supervision. The improved performance relative to other streetcar routes was sustained through to the beginning of the second quarter of 2018 demonstrating the success of the pilot.

Schedule adjustments were made in May 2018, June 2018, and October 2018 based on collected data to better align to pilot-period operating conditions. The schedule changes were implemented to pilot new approaches to improve on-time performance, as well as other reliability measures. These schedule adjustments have had varied success and have provided valuable lessons learned. The results of the schedule change are not related to the pilot project, but due to increased ridership, a change in route structure in October 2018 and different operating characteristics of low-floor streetcars. Based on lessons learned, further adjustments are planned in spring 2019 to improve on-time performance and related performance measures.

Figure 7: Weekly On-Time Performance, 504 King Streetcar



Route productivity increased with more riders per service hour

A common measure for cost-efficiency and productivity of transit service is the number of customers per hour of service operated. Overall, TTC is one of the most productive transit agencies in North America, with approximately 80 boardings per hour of service.

TTC’s streetcar service is, in general, highly productive from a combination of high ridership through denser urban corridors and lower operating requirements from the higher capacity of the vehicles. As outlined in Figure 8, increased ridership during the pilot has increased route productivity by 25% to approximately 125 boardings per hour of service. Some of this gain is a result of efficiencies resulting from the full deployment of low-floor streetcars on the route in October 2018.

Figure 8: Route Productivity

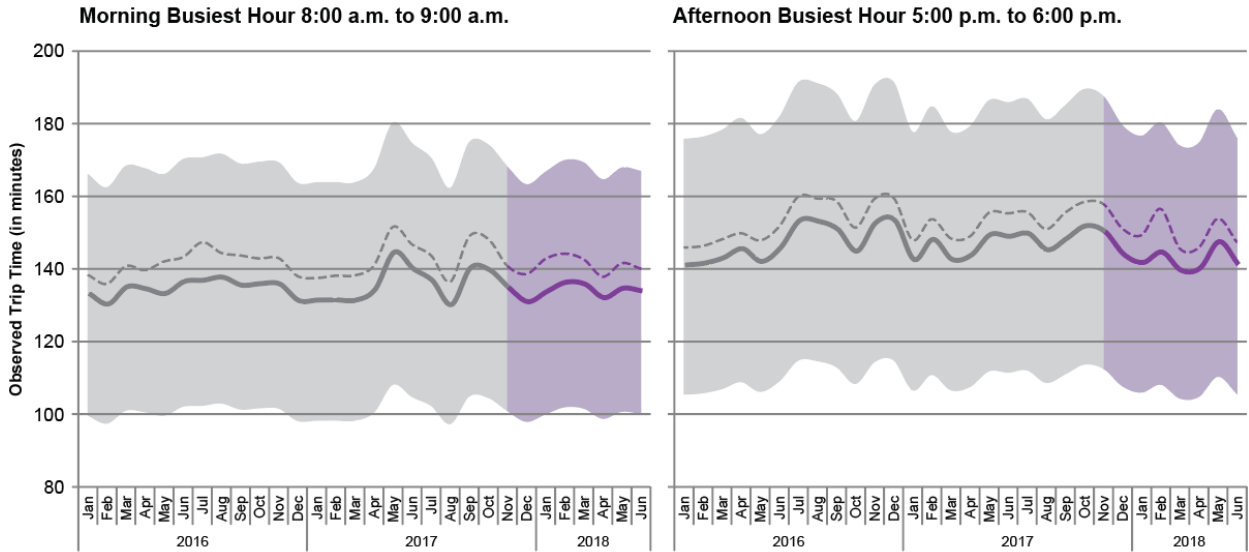
	King Streetcar Corridor			Other Routes		
	Pre-Pilot	March 2018	October 2018	510 Spadina	501 Queen	29 Dufferin 929 Dufferin
Daily Ridership	72,000	81,000	84,000	40,000	55,100	42,300
Scheduled Revenue Hours	710	780	670	270	820	530
Boardings per Revenue Hour	101	104	125	148	67	80

Operating Cost Savings

The cost of operating transit service is directly related to the operating speed and scheduled running time. In general, TTC schedules routes to provide adequate running time between the 85th and 95th percentile of observations. Therefore, if variability can be reduced, significant savings can result, particularly on high-frequency routes. For example, on 504 King, where service operates every 3 to 4 minutes, every equivalent reduction in 85th percentile travel time results in one streetcar saved.

During the pilot, low-floor streetcar were introduced on 504 King, resulting in slower average travel speeds compared to the smaller, CLRV streetcar that operated at the start of the pilot. The low-floor streetcar has different operating characteristics, including different door operation, periodic accessible ramp deployment, and higher customer volume. On other routes, TTC has observed that low-floor operation is approximately 10% slower than CLRV and ALRV operation. This is offset by the benefit of accessibility and higher capacity provided by the low-floor streetcar. It is therefore likely that the travel time savings on King are understated, as low-floor operation occurred after the pilot began and travel times are being compared to operation with different vehicles. In general, 85th percentile travel times with low-floor streetcars have remained unchanged compared to CLRV operation.

Figure 9: 504 King Full Route Travel Time
 504 King Full-Route Travel Time (Dundas West Stn-Broadview Stn)



NOTE: Full-route running time is comparable to pre-pilot conditions only until June 2018, when 504 King route structure was changed to accommodate construction and again in the fall to restructure service on the corridor

The risk if the King Street Pilot Project is not made permanent is that travel times would increase, resulting in the need to operate more streetcars to provide the same capacity. Assuming increased average travel times of between 2 to 4 minutes in each direction and an increase in variability of 25% in peak periods and 10% in off-peak periods, this would result in an increased operating cost of approximately \$660,000 per year at current service levels. This cost would be reduced if increased demand returns to pre-pilot levels, at which the additional cost of service would be approximately \$132,000 per year.

c) More people taking transit in the King Street corridor

Ridership on streetcars on King Street immediately increased upon the implementation of the pilot project in mid-November 2017. Increases were observed at all times of the day, including in off-peak periods and on weekends. The early consequence of the increased demand was crowding on streetcars and despite the introduction of low-floor streetcars and increased service, crowding remains a concern during the busiest periods of the day.

All-day streetcar boardings increased by 17% to 84,000 per day

Figure 10 shows the weekday route-wide ridership totals for the 504 King and 514 Cherry streetcar routes. Overall, weekday ridership has increased by nearly 17% between September 2017 and October 2018 to approximately 84,000 customers per day. The lower values observed in March and June are consistent with observed seasonal variation in ridership system-wide.

Figure 10: Streetcar Ridership in King Street Corridor

	Pre-Pilot	November 2017	March 2018	June 2018	October 2018
Daily Ridership	72,000	84,000	81,000	80,000	84,000

NOTE: Daily ridership prior to October 2018 includes boardings for 504 King and 514 Cherry streetcar routes

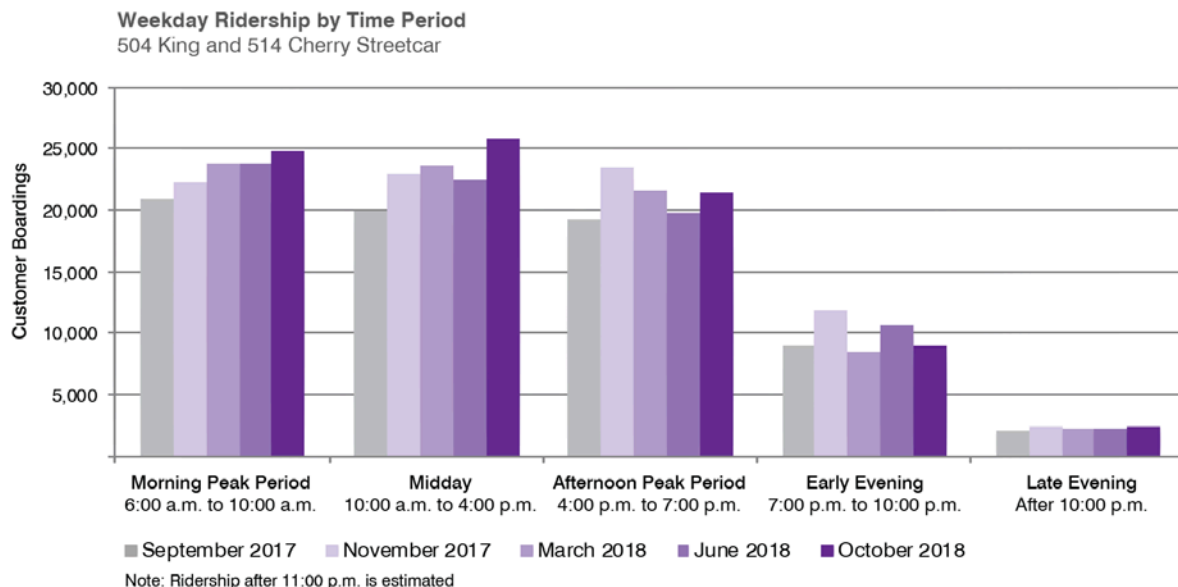
Ridership increases also observed in off-peak periods

As shown in Figure 11, ridership increases are consistently observed at most times of the day, particularly in the midday, where ridership has increased between 10% and 25%. Early evening ridership fluctuates depending on time of year due to special events occurring in the downtown and weather. For example:

- the November 2017 count was taken during the Distillery District Christmas Market, which resulted in major increase in off-peak ridership between the subway and the Distillery District;
- the March 2018 count was taken during a period of cold weather, which would have reduced discretionary trips made in the corridor; and,
- the June 2018 counts is likely a result of reduced ridership during the warmer months when some streetcar customers walk or bike instead. This is consistent with walking and cycling volume data that showed a 15% increase in pedestrian volumes between March and June.

Late evening ridership remains largely unchanged.

Figure 11: Weekday Ridership by Time Period

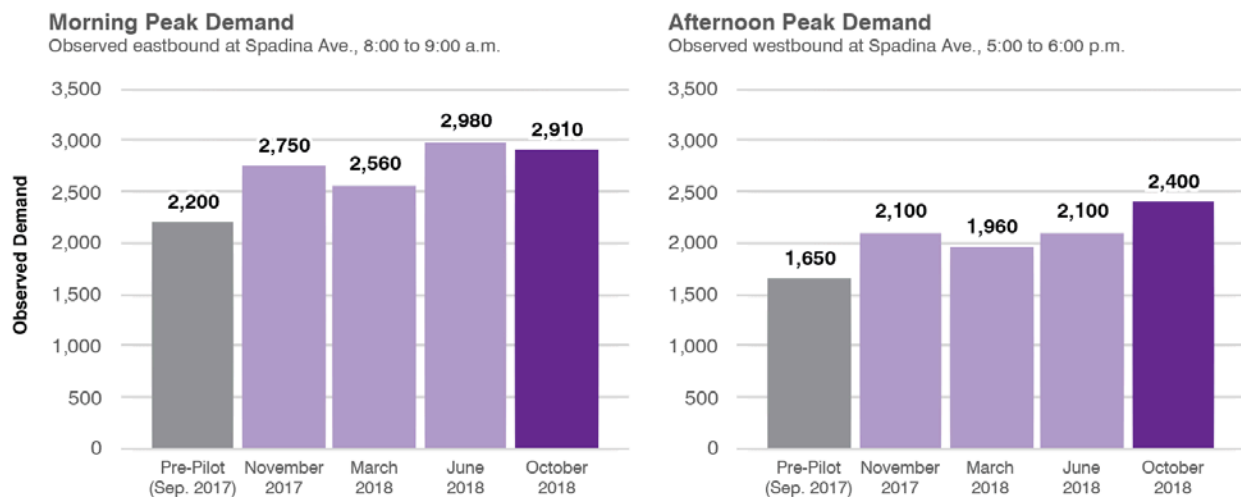


Peak hour demand has increased by 30% and 45% in the morning and afternoon, respectively, responding to more reliable travel.

The peak point, peak hour demand for the surveyed periods is provided in Figure 12 for the AM and PM peak hours. The location of this count is eastbound departing Spadina Avenue in the morning, while it is westbound approaching Spadina Avenue in the afternoon. In October 2018, AM peak hour demand increased by over 30% while the PM peak hour demand increased by 45% from the September 2017 baseline.

Improved and more reliable service delivery, particularly in the afternoon rush hour, likely contributed to greater demands. As discussed later in the report, the implementation of the new low floor streetcars on the King routes has significantly increased the capacity of the corridor meaning that more passenger trips can be accommodated when passengers need and use the service most. The combination of improved reliability and additional capacity illustrates the amount of latent demand on the corridor that was previously unserved.

Figure 12: Peak Demand



Note: Observed peak demand is the number of customers observed in the busiest direction, at the busiest location, in the busiest hour.

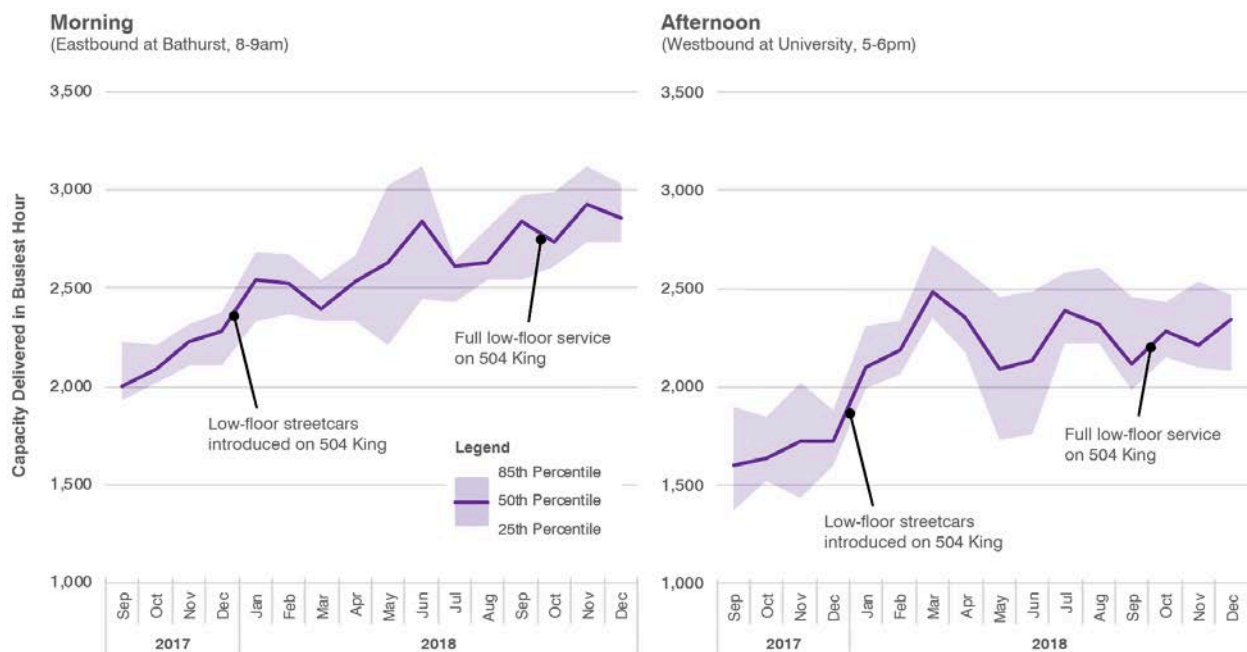
Capacity was increased significantly on King Street through pilot period, but crowding remains a challenge

The capacity scheduled on all TTC routes is based on the observed peak demand and the average number of customers per vehicle compared to the service standards approved by the TTC board. On streetcars, during peak periods, the standard is 74 customers for CLRVs and 130 for low-floor streetcars. Most streetcar routes operate at approximately 95% of crowding standard and prior to the start of the King Street Pilot, the service scheduled reflected the pre-pilot demand.

At the start of the pilot, the increase in peak demand resulted in consistent overcrowding on CLRV streetcars. Low-floor streetcars had been introduced on 514 Cherry in fall 2016 to provide increased capacity in the busiest section of the route, however, this was not sufficient to meet the new demand. Consequently, low-floor streetcar introduction began on 504 King in early December 2017, ahead of schedule, with full deployment in late October 2018.

Figure 13 illustrates the monthly average and range of streetcar capacity delivered at the peak point in the morning and afternoon peak periods. Since the start of the pilot, delivered capacity has increased from approximately 2,000 customers per hour in the morning peak period to approximately 2,900 customers per hour. In the afternoon peak period, it has increased from approximately 1,600 customers per hour to approximately 2,400 customers per hour. Despite this increase, overcrowding is still observed at the busiest times. Further measures to increase capacity will be explored, including adding more streetcars or reintroducing supplemental bus service at the busiest times.

Figure 13: Peak Capacity



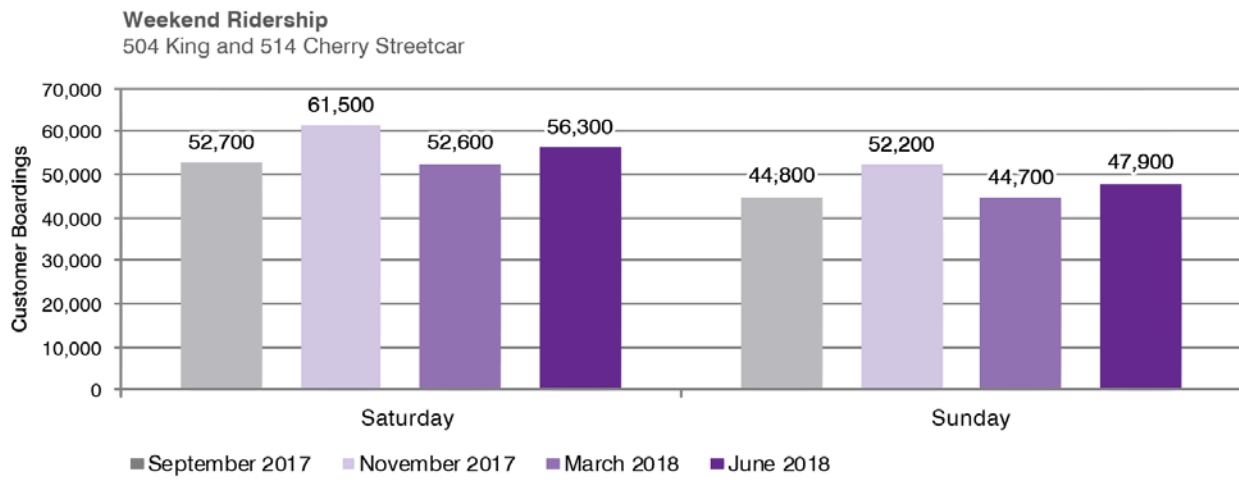
Note: Capacity delivered calculated based on vehicle capacity as defined by TTC Service Standards. Peak period standards for bus (51), CLRV streetcar (74), ALRV streetcar (108), and low-floor streetcar (130)

Weekend Ridership

Weekend ridership was estimated based on PRESTO taps and trends. The estimates are presented in Figure 14. A weekend estimate for October 2018 is unavailable due to the large growth in PRESTO penetration after the implementation of the two-hour time-based transfer in August 2018. Weekend ridership is highly variable on streetcar routes downtown – special events, road restrictions, and subway closures all have significant impacts on ridership on a week-over-week basis.

Generally, weekend ridership has increased since the implementation of the pilot. In November 2017, an increase of approximately 16% was observed from September 2017. This can be attributed to the Distillery District Christmas Market and the Santa Claus Parade. A further sample in June 2018 showed an increase of 7% over pre-pilot levels. A minor decrease was observed in March 2018, however, the decrease was still less than the overall system wide ridership difference of approximately -5% for weekends when comparing November 2017 and March 2018 data.

Figure 14: Weekend Ridership



d) Greater customer satisfaction with King streetcar service

The King Street Transit Pilot has improved perceptions of customer satisfaction with transit service in the King Street corridor. The TTC conducts a quarterly Customer Satisfaction Survey (CSS) that provides an insight on perceptions of TTC service and operations.

Figure 15 illustrates the trend in the CSS results for the King streetcar service between the start of 2016 through the end of 2018. Since the start of the King Street Transit Pilot, satisfaction has increased significantly on two key measures that can be attributed to the pilot: overall satisfaction and trip duration. In 2018, perceptions of trip duration, a

key driver of overall customer satisfaction, averaged 88%, which is the highest of all streetcar routes.

Perceptions of crowding and wait time improved at the start of the pilot, which is reflective of a period where low-floor streetcars were replacing CLRV streetcars one-for-one, resulting in more capacity being operated.

Another measure tracked in the CSS is “value for money”, which increased from 58% in the pre-pilot period in 2017 to 71% in 2018. Of all streetcar routes, 504 King had the second highest “value for money” score in 2018, with only the 512 St Clair, which operates in its own right-of-way, performing better (72%).

Figure 15: Customer Satisfaction Survey Results – 504 King Streetcar

