Results of TransLink's Bus Stop Balancing Pilot: A Report on Line 2

Table of Contents

Executive Summary

Bus Stop Balancing refers to the thoughtful removal of bus stops to maintain convenient access and provide faster, more reliable service. In September 2020, TransLink piloted bus stop balancing on Line 2 in Vancouver by removing about 25% of the bus stops for a six-week period. The pilot demonstrated benefits to travel time and reliability for transit customers. As a result, most of the changes from this pilot were made permanent. The pilot now serves as a basis for a program that will improve stop spacing across the region.

What is Bus Stop Balancing? Why is it important?

In many locations, bus stops are too close together. TransLink's 2018 Transit Service Guidelines recommend stop spacing of 300 to 800 metres for Frequent Service. This is equivalent to a 5 to 10-minute walk between bus stops. However, two-thirds of bus stops are closer together—sometimes appearing twice on the same block.

Distance between bus stops affects travel time. When stops are too close together it increases the length of the trip for everyone. By thoughtfully removing stops, we will reduce the amount of time buses spend slowing down, pulling into the stop, waiting for traffic to pass before pulling out of the stop, and speeding up again. Balancing bus stops helps our customers get to their destinations faster.

Travel time affects customers and operating costs. Buses spend one-sixth of their time at bus stops. That adds up to more than 700,000 hours or about $73 million in operating costs each year. In addition to enhancing our customers' experience on buses, making a small change in stop spacing can have a large effect on operating costs. Balancing bus stops on 25 of the most frequent routes could save up to $3.5 million per year.

Balancing bus stops is a win-win proposition. For our customers, bus stop balancing means shorter travel times, more reliable service, more comfortable ride, and reduced operating costs which can be reinvested as longer hours or higher frequency of service.

For cities, businesses, and residents, bus stop balancing means that closed bus stops can be repurposed for other street uses such as patios, bike racks, pedestrian bulbs, queue jumps, short-term loading zones, or on-street parking.

Bus stop balancing requires careful trade-offs. We thoughtfully consider many factors to find the right balance between convenient access and reliable service. These factors include accessibility, customer safety and comfort, topography, service type, distance between stops, adjacent land use, stop usage and transfers. We also analyzed demographic data to ensure that our proposal would not disproportionately affect seniors, people of color, or low-income households.

Figure 1. Buses spend one-sixth of their time dwelling at bus stops.
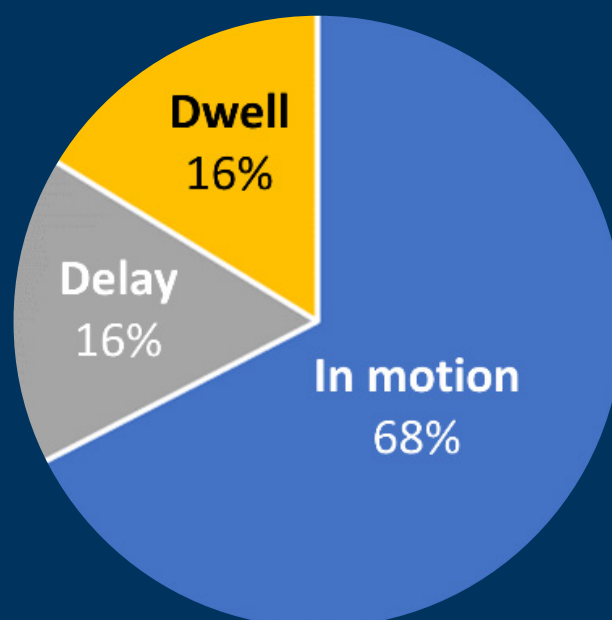
Pilot on Line2

We selected Line 2 for the bus stop balancing pilot because its high frequency and narrow stop spacing presented the best opportunity to achieve measurable travel time savings. Line 2 offers frequent service all-day between Dunbar Loop and Downtown Vancouver via 41st Ave, Mackenzie, Macdonald, Cornwall, and Burrard. It generally travels through low-density residential neighborhoods before entering Downtown Vancouver.

Before bus stop balancing, Line 2 had the closest bus stops in the TransLink network. More than 80% of stops were closer than the 300 metres recommended by TransLink's guidelines. Half of the stops were less than 205 metres apart. The two closest stops on this route were less than 90 metres apart—roughly the length of a SkyTrain platform.

Our approach to bus stop balancing

We carefully selected bus stops to remove during the pilot. TransLink developed a draft proposal by first identifying which stops should be maintained. These included stops near major destinations, stops near steep slopes, and transfer points. We also excluded bus stops where the accessible ramp was frequently deployed because it suggested that this bus stop was often used by customers with mobility devices such as wheelchairs or walkers.

Next, we identified stops to close which would achieve stop spacing of 300 – 500 meters, or roughly a 5 to 7-minute

walk. When two stops appeared to be equally valid candidates for bus stop balancing, we decided to keep bus stops that were well-used, near crosswalks, or had amenities like shelters.

We vetted early proposals with key stakeholders including bus operators, municipal staff, business improvement associations, schools and parent advisory committees, senior living and activity centers, and medical centers. We revised our proposal based on this initial feedback.

Finally, we analyzed demographic data around bus stops to understand how the proposal affected our customers. The percentage of people living within 400 metres of a bus stop dropped by less than 1%. We used Census data to ensure that we were not removing stops from areas with higher numbers of seniors, Black, Indigenous and People of Colour (BIPOC) or low-income households.

Our proposal for Line 2

Following outreach to key stakeholders, we proposed to close about one-quarter of bus stop on Line 2. We identified 21 out of 86 bus stops for closure, or about 10 – 11 per direction of travel. As a result, we expected to save about 4 minutes per roundtrip.

We also removed the timing point to take advantage of travel time improvements. A timing point is a special bus stop in the middle of the route where bus operators wait if they are ahead of schedule. By removing the timing point on Line 2 during the pilot, customers were able to enjoy the full travel time benefits of bus stop balancing.

Community Engagement

We conducted proactive and extensive engagement throughout the pilot. We tailored our communications for each stakeholder group to increase awareness.

Figure 2. Final proposal for bus stop balancing on Line 2

List of Removed Stops	
2 Downtown	**2 Macdonald**
SB Burrard St at W Georgia St	WB Cornwall Ave at Maple St
NB Mackenzie St at W 36 Ave	SB Macdonald St at W 3 Ave
NB Mackenzie St at W 32 Ave	SB Macdonald St at W 13 Ave
NB Mackenzie St at W 28 Ave	SB Macdonald St at W 19 Ave
NB Macdonald St at W 24 Ave	SB Macdonald St at W 23 Ave
NB Macdonald St at W 20 Ave	SB Quesnel Dr at W 27 Ave
NB Macdonald St at W 18 Ave	SB Mackenzie St at W 31 Ave
NB Macdonald St at W 13 Ave	SB Mackenzie St at W 35 Ave
NB Macdonald St at W 10 Ave	
NB Macdonald St at W 5 Ave	
EB Cornwall Ave at Larch St	
EB Cornwall Ave at Vine St	
EB Cornwall Ave at Maple St	

This included:

- sending more than 165 letters, including 26 personalized letters to key stakeholders;

- consulting with four business improvement associations (Dunbar, West Broadway, Robson Street, and Downtown Vancouver);

- consulting with the parent advisory committee at Henry Hudson Elementary School;

- consulting with three advisory committees (TransLink Users' Advisory Committee, Vancouver Persons with Disabilities Committee, Vancouver Transportation Advisory Committee); and

- partnering with the Canadian National Institute of the Blind to send notifications by emails and telephone to all members in surrounding postal codes.

Before and during the pilot, we posted signs at all stops on the route to let customers know about the pilot and invite their feedback. At affected stops, we notified customers of upcoming changes and directed them to the nearest alternative stops.

We launched a dedicated webpage to share detailed information about the project at **www.translink.ca/busstopbalancing**.

We monitored public comments throughout the project. We received comments through a dedicated project email address, customer service centre, and operators. We also tracked feedback in social and traditional media.

We also monitored feedback from operators. We provided front-line staff with information about the pilot to support customers, including reminders to watch for intending customers who may not be able to see or read the signs. For the first and last week of the pilot, transit supervisors were posted at the downtown end of line to gather feedback from operators.

Figure 3. Examples of signs posted at bus stops on Line 2 before and during the pilot.

Results

1. **The overwhelming majority of customers retained their bus stop and had better service.** 86% of customers were able to use their existing bus stop and had a faster, more reliable trip. Although 14% of customers' stops were closed, the nearest alternative was generally within one block of the closed stop.

2. **Wider stop spacing better matched TransLink's guidelines.** Before the pilot, only 16% of bus stop were within our recommended spacing. After the pilot, more than half (52%) of bus stops are within our recommended spacing. We retained some closely spaced bus stops where necessary.

3. **Wider stop spacing improved average travel time.** Between September 2020 and April 2021, roundtrip travel times on Line 2 improved by 5 minutes on average and up to 10 minutes during the busiest times of day. Buses spent 2.5 – 4 minutes less time dwelling at bus stops, which we attribute to bus stop balancing. Up to one-third of that dwell time savings was due to removing the mid-route timing point.

4. **Wider stop spacing improved reliability.** The slowest trips of the day demonstrated the greatest improvements. This suggests that bus stop balancing improved the reliability of Line 2. Reliability affects TransLink and our customers. TransLink mitigates unpredictable travel time by adding padding to the schedule. More reliable travel time allows us to write shorter, more efficient schedules. Likewise, customers must often start their journeys early to account for unpredictable travel times. More reliable travel time allows customers to plan their transit trips more accurately.

5. **The pilot allowed customers to experience changes and provide feedback.** Some customers expressed concerns about changes to bus stops, especially at the beginning of the pilot. However, there were few specific concerns about any single proposed closure. Based on public feedback and further review, one pair of bus stops was reinstated.

Improving bus stop balancing in the future

In addition to the results above, we identified several ways to improve bus stop balancing in the future.

○ **We will translate signs at some bus stops for future engagements.** Although we did not receive feedback about translation during the Line 2 pilot, we know that this is a powerful tool to improve engagement. We will translate signs in neighborhoods where 25% or more residents speak a language other than English at home.

○ **We will introduce Engagement HQ and QR codes on signs to allow the public to provide feedback more easily.** Engagement HQ is an online information hub and survey tool. QR codes on signs will direct customers with a smart phone to our Engagement HQ site to learn more about our bus stop balancing projects and provide feedback.

○ **We will synchronize bus stop balancing with the regular service change.** We will work with Coast Mountain Bus Company to identify opportunities to proactively adjust runtime and timing points at the beginning of the pilot. Removing timing points accounted for one-third of dwell time savings. This element of the program should be retained in the future.

○ **We will fund shelter relocations.** It is important that shelters from closed stops be relocated to other bus stops as soon as possible. The city is responsible for provision and relocation of shelters and benches. However, to support and expedite shelter relocation, TransLink will fund shelter relocation through the Bus Speed and Reliability funding program. We anticipate that operating savings allow us to recoup the cost of shelter relocations in about one year.

Based on the success of the bus stop balancing pilot, we will continue to balance bus stops on frequent routes throughout the region. We will target 4 – 8 routes per year, focusing on the all-day and peak-hour frequent routes. We will prioritize based on benefit to operating cost, benefit to customer experience (e.g. travel time savings, proportion of customers negatively affected by stop changes), ease of implementation (e.g. risk, municipal participation), and geographic distribution.

By balancing bus stops on 25 of the most frequent routes, we could save $3.5 million/year in operating costs by reducing runtime or avoiding adding new runtime. A modest reduction of 12 – 15 seconds per bus stop removed would yield about $140,000 in annual savings per bus route, on average.

Several factors will influence how quickly we can balance bus stops on these routes, including internal staff capacity, municipal staff capacity, and ongoing public and political support.

Several factors also influence the amount of operating cost savings we can achieve per route, including current runtime and variability, frequency of service, and recovery time.

We are committed to ensuring this program does not disproportionately impact any equity seeking groups and delivers our customers with fast and reliable service. If you have any suggestions on how we can make this program better or questions please email **busstopbalancing@translink.ca**

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