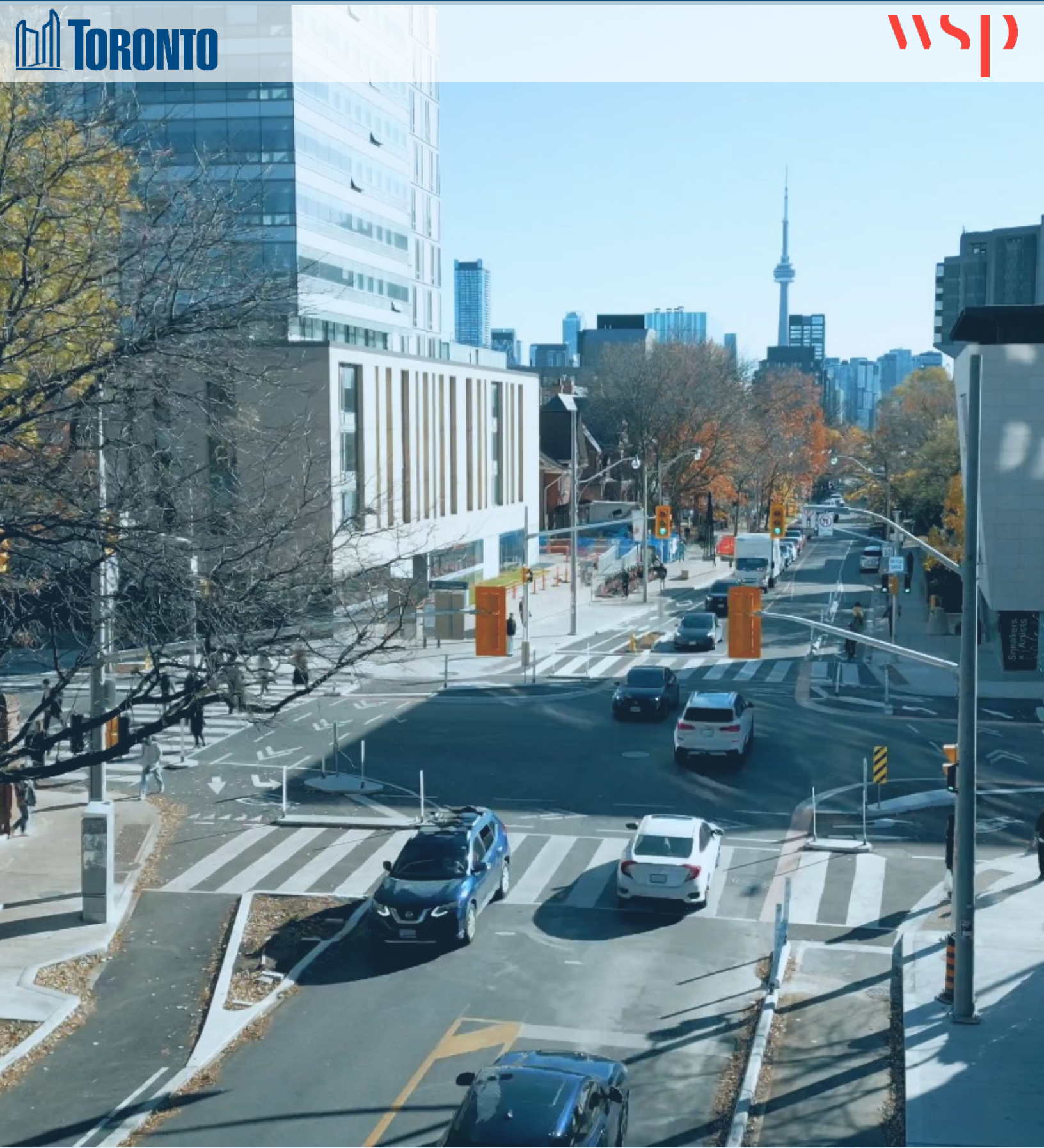
Schedule 'B'

Index of Documents

Bloor Street West Reconstruction

Avenue Road to Spadina Avenue



PROJECT BACKGROUND

Bloor Street West is an iconic main street within the City of Toronto, serving competing demands for transit access, mobility, public realm and active transportation connections. It serves as a major east-west arterial corridor running through downtown Toronto. Between Avenue Road and Spadina Avenue, Bloor Street West is home to various businesses, neighbourhoods, and key destinations including the University of Toronto (UofT) campus and residences, the Royal Ontario Museum (ROM), the Bata Shoe Museum and the Royal Conservatory of Music.

Between 2020 and 2024, the City of Toronto, supported by WSP Canada, redesigned and reconstructed Bloor Street West, from Avenue Road to Spadina Avenue, to enhance accessibility and safety for all road users.

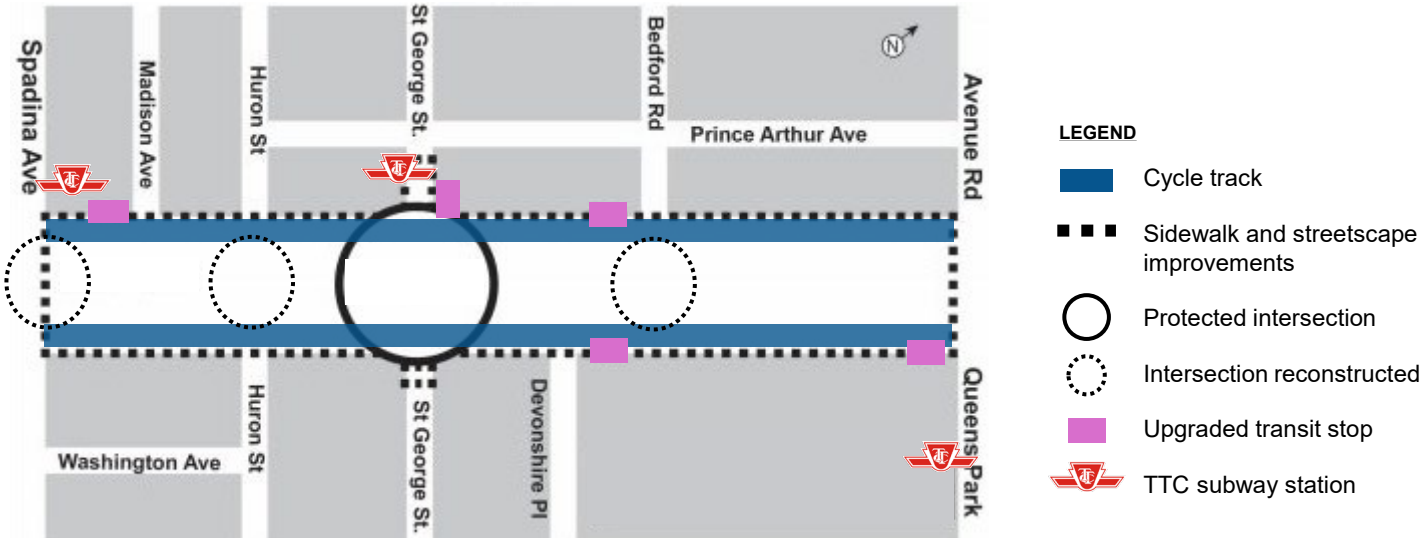
PROJECT BACKGROUND

Prior to the reconstruction, Bloor Street West was a heavily used travel corridor, carrying significant volumes of pedestrians, cyclists, and vehicles. With an average of 22 collisions involving cyclists each year in the section between Shaw Street and Avenue Road, this area represented a documented safety concern. In 2016, separated bike lanes with painted buffers and bollards were installed on Bloor Street West between Avenue Road and Shaw Street as part of a pilot project, which were made permanent in 2017. These bike lanes led to a significant increase in cycling volumes along the corridor and enhanced comfort and safety for both motorists and cyclists.

Planned watermain and subsequent road reconstruction work along Bloor Street West, between Avenue Road and Spadina Avenue, presented an opportunity to build on this success to further enhance safety for pedestrians and cyclists and reduce risk for all road users. This initiative aligned well with the City's commitment to its **VISION ZERO PLAN**.

In 2020, the City of Toronto, supported by WSP Canada, began the planning and redesign of Bloor Street West between Avenue Road and Spadina Avenue. The process took three years of technical design, planning, and meaningful public engagement. Construction took place between 2023 and 2024, and included the following key elements:

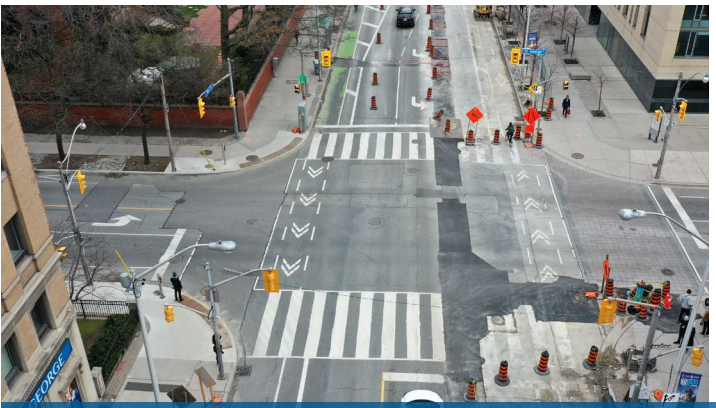
- Reconstruction of the concrete road base and replacement of the asphalt road surface
- Sidewalk replacement and accessibility upgrades to meet current standards
- Installation of permanent raised cycle tracks
- Construction of a protected intersection at Bloor Street West and St. George Street
- Transit stop upgrades
- Streetscaping improvements and installation of green infrastructure features



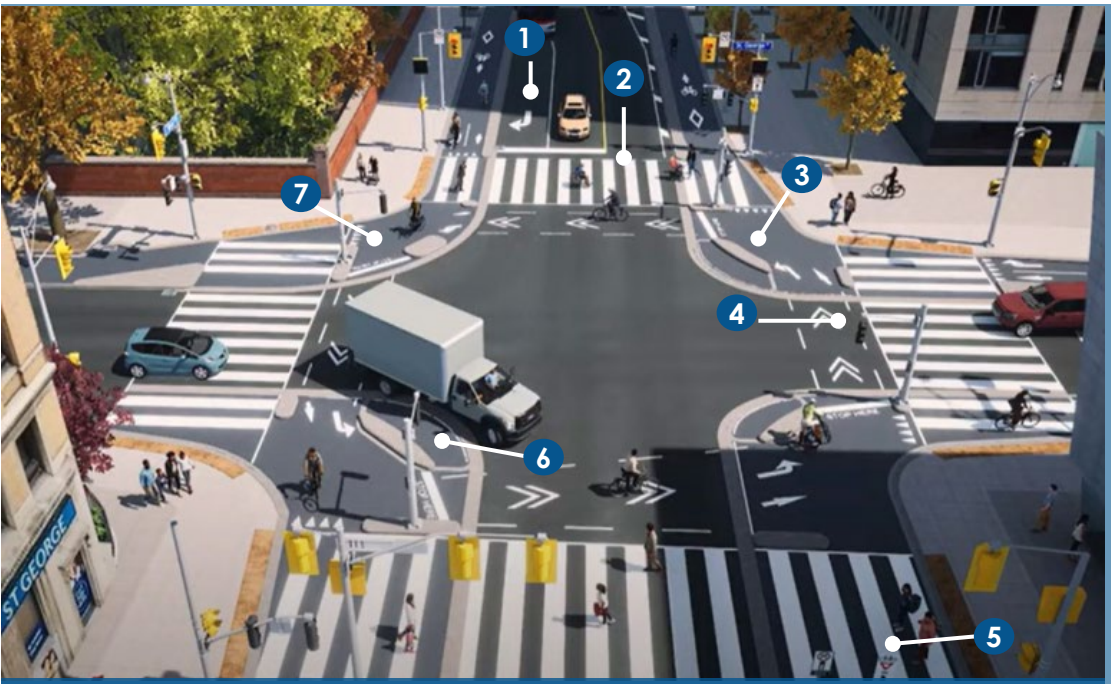
KEY DESIGN ELEMENTS

PROTECTED INTERSECTION

Constructed at Bloor Street West and St. George Street, the protected intersection features set back pedestrian and bicycle crossings, dedicated bike signals, signage, modifications to traffic signal controls.



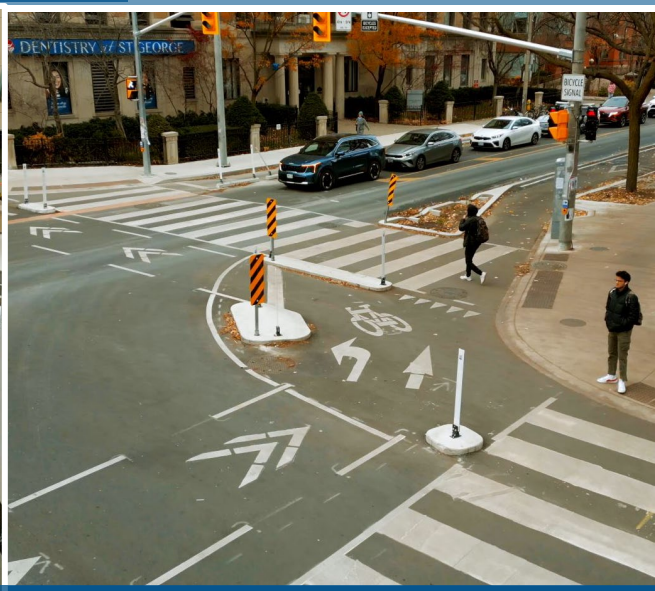
BEFORE CONSTRUCTION



RENDERING

Intersection Elements

1. **Right turn lane with separate phase**
2. **Wide crosswalks**
3. **Corner protection island**
4. **Dedicated bike signals**
5. **Bikes yield to pedestrian signage**
6. **Mountable truck aprons**
7. **Cyclist queuing areas with forward stop bars**

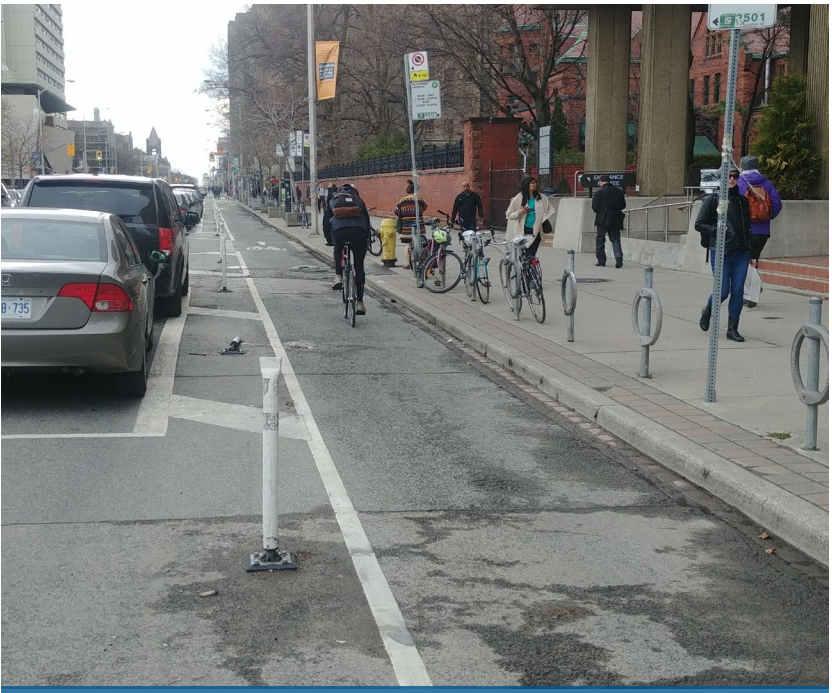


AFTER CONSTRUCTION

KEY DESIGN ELEMENTS

RAISED CYCLE TRACKS

The existing separated bike lanes were upgraded to raised cycle tracks, with on-street parking defined by precast concrete medians, barrier curbs between vehicle curb lane/parking, and bevelled (rolled) curb between cycle track and sidewalk for easier access across the cycle track for people using mobility devices.



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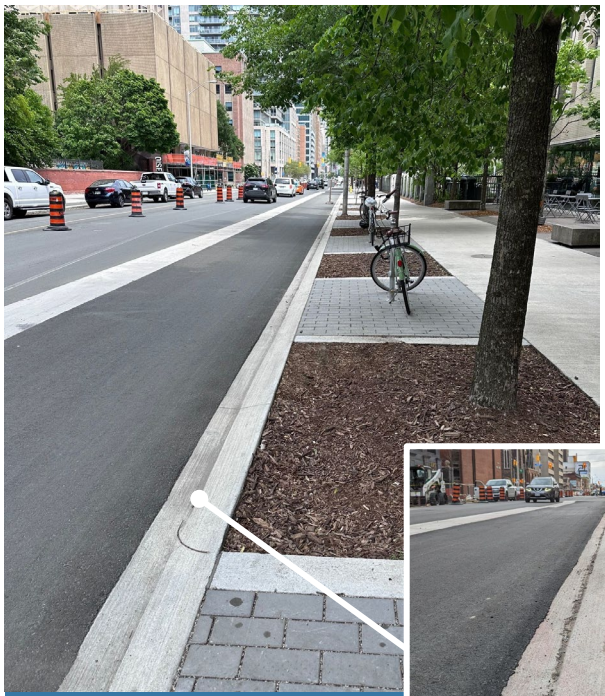

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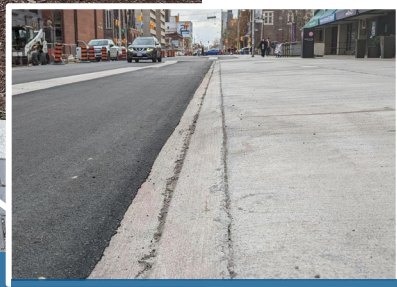
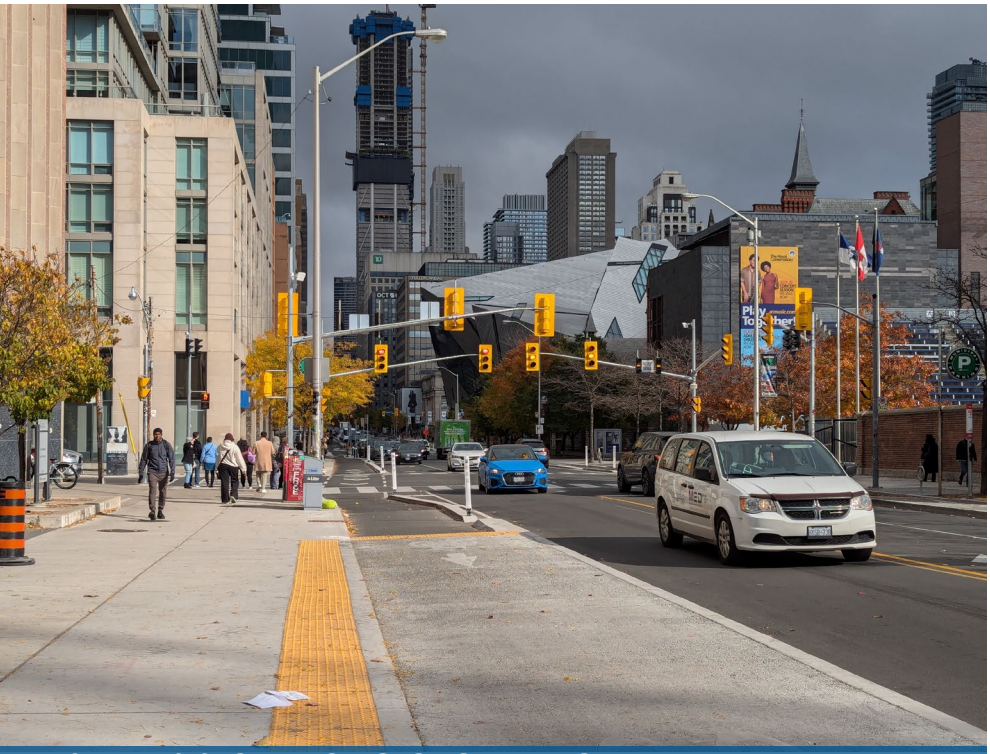


BEVELLED CURB



RAISED BUS STOP ALONG CYCLE TRACK

TRANSIT STOP UPGRADES

Transit stops were upgraded with raised platforms to accommodate the new cycle track. These platforms, up to 38 metres long, were added where buses pull up alongside the cycle track, meeting current accessibility standards.

The raised transit stop platforms are made of permeable concrete to allow for stormwater to infiltrate in lieu of trench drains and avoid conflict with existing utilities.

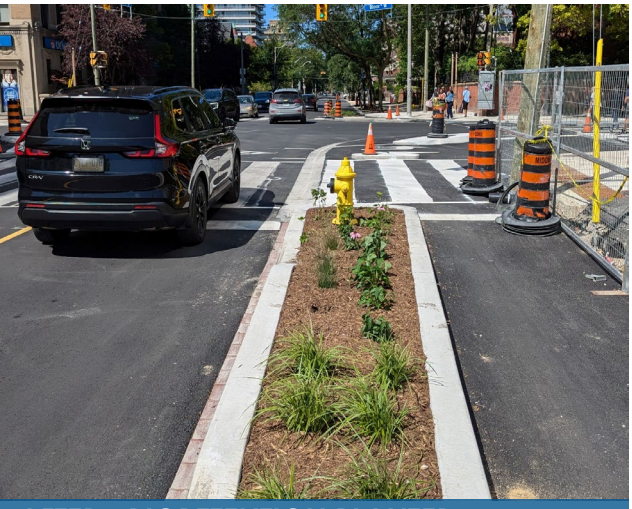
KEY DESIGN ELEMENTS

SIDEWALK AND STREETSCAPE IMPROVEMENTS

Sidewalks were replaced and upgraded to meet current accessibility standards. Streetscape improvements enhanced the user experience throughout the corridor.

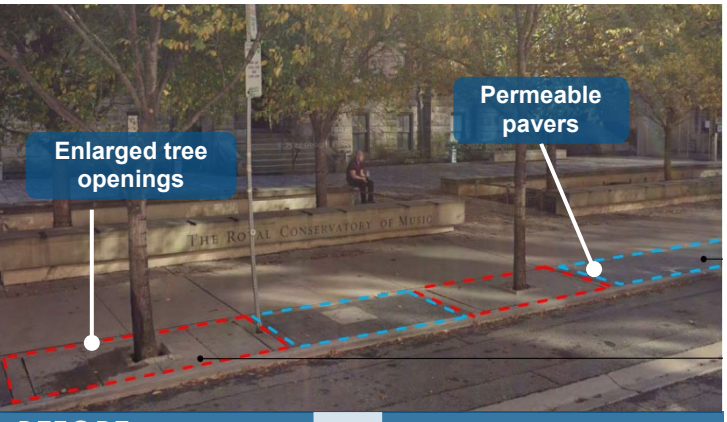
GREEN INFRASTRUCTURE

Green infrastructure components were also installed along the corridor, in line with the City's Green Streets Technical Guidelines. Implemented green infrastructure features included permeable pavers and concrete, bio-retention planters and structural soil cells.



AFTER - BIORETENTION PLANTER SEPARATING THE CYCLE TRACK

BEFORE



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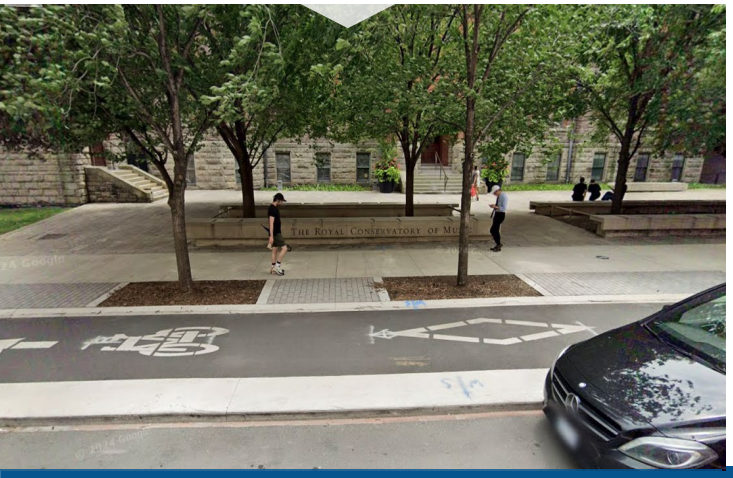

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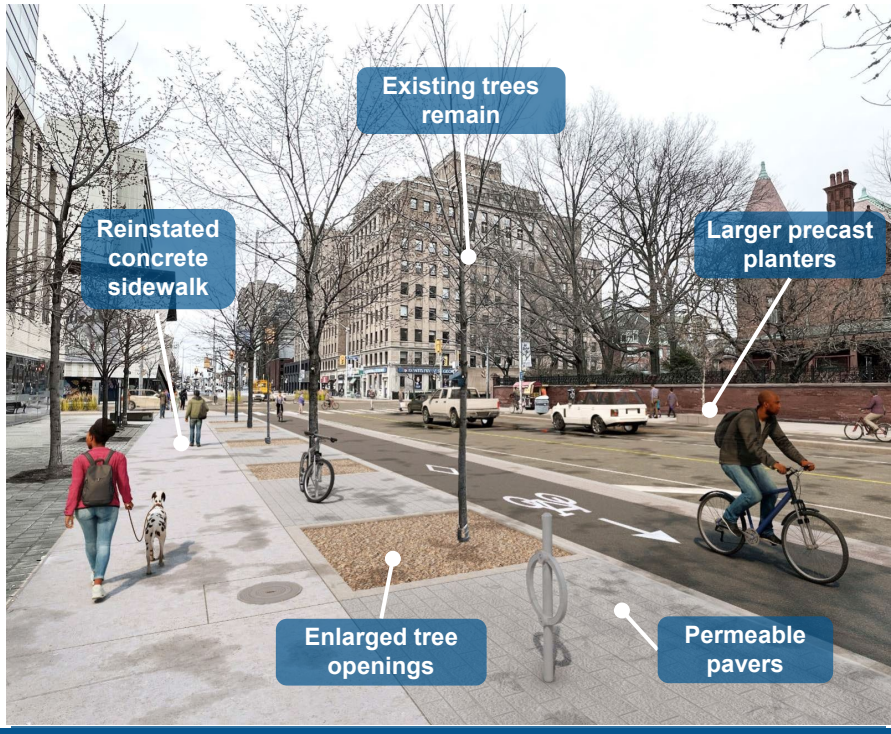
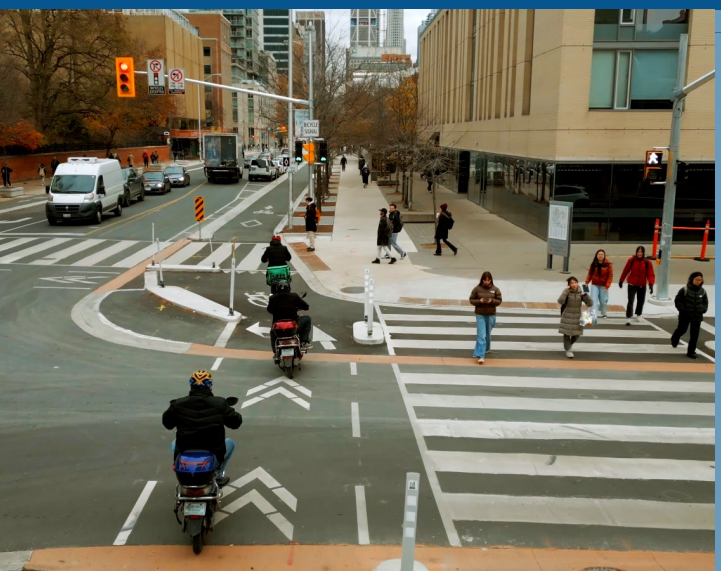


RENDERING

OUTCOMES



- Enhanced safety for all road users
- Enhanced mobility
- Improved accessibility
- Supported environmental goals
- Improved sense of place

SAFETY, ACCESSIBILITY, & MOBILITY

The project resulted in enhanced safety for all road users, while improving walkability, bikeability, and accessibility throughout the corridor.

The primary safety upgrade was the **protected intersection** at Bloor Street West and St. George Street. This intersection is at the heart of Canada's largest University, the University of Toronto. The high volume of turning movements by people driving, walking, and cycling makes this intersection an ideal candidate for a protected intersection. The decision to incorporate this design in such a constrained environment was driven by an unfortunate cyclist fatality at the intersection which likely could have been prevented with a protected corner.

The intersection's design enhances safety for cyclists and pedestrians in several ways:

- By providing greater separation from motor vehicles and reducing the likelihood of collisions
- Improves sightlines for all users, forcing vehicles to be perpendicular with crossing pedestrians and cyclists
- Tightened turn radii and corner islands naturally slow down vehicle speeds
- Encourages predictable movements from all users
- Shorter crossing distances reduce pedestrian and cyclist exposure to vehicle traffic

OUTCOMES

RAISED CYCLE TRACK

Like with the protected intersection, **safety and accessibility was enhanced for all users** by the implementation of raised cycle tracks. The corridor experiences significant volumes of cyclists; the reconstruction of Bloor Street West upgraded the existing separated bike lanes to a raised cycle track design, further improving road safety along the corridor for all users by providing greater separation from vehicles. Bevelled (rolled) curbs were used between cycle track and sidewalk, allowing access across the cycle track for people using mobility devices.

PLACEMAKING & SUSTAINABILITY

Beyond providing safe pedestrian movement and access, pedestrian zones serve as vital public spaces that contribute to the city's economic, social and environmental well-being.

The pedestrian realm was made **more accessible** to more users through sidewalk improvements and accessibility upgrades to meet current standards. Transit stop upgrades also keep the bikeway clear for people cycling, while providing sidewalk-level access for people boarding and exiting TTC buses.

Streetscape interventions integrate both aesthetic and functional enhancements, working together to create a **sense of place and an attractive, sustainable public realm**. Green infrastructure components support the environmental goals of the City, like managing stormwater runoff and reducing the urban heat island effect, while being visually appealing.

Public realm improvements like these have created more **accessible**, **inviting spaces**, making Bloor Street West more pleasant for residents, students, and visitors.

BEFORE

AFTER - BIORETENTION SYSTEM AT BLOOR STREET WEST/ ST. GEORGE ST

INNOVATION

Key innovative elements of the Bloor Street Reconstruction include:

- **Protected phase vs truck apron:** Truck aprons were incorporated into the design of the corner islands at the Bloor/St George intersection except at the one corner where transit vehicles will not go over them. Since a truck apron could not be provided to encourage proper passenger vehicle alignment for better sight lines to crossing cyclists and pedestrians, a separate right turn phase was provided to eliminate the conflict.

- **Near side bike signal heads:** The Bloor/St George intersection is the first location for installation of near side 100mm bicycle signal heads in the City of Toronto. With the alignment of the cycle track through the protected intersection, these supplementary heads improve visibility of the signals for cyclists as they approach the intersection. These signal heads are also used to re-enforce the stopping location for cyclists in advance of the crosswalk.

- **Permeable concrete for bus platforms:** Underground utility conflicts at some of the raised transit stop platforms created challenges with the standard design of the platforms with trench drains. In order to mitigate these conflicts and provide drainage without affecting the cycle track alignment, a permeable concrete surface was used.

- **Flex space lay-by at ROM**: The ROM sometimes hosts gala events needing a pick-up/drop-off area. A lay by area at sidewalk level was created by delineating with material type and removable bollards so that it would be used primarily as sidewalk space but could be used as a pick-up/drop-off space when needed.

- **Promotion with use of fly-though video**: New types of facilities like protected intersections are not always easy for people to visualize and understand. A “fly through” video of the intersection was used for public engagement and promotion to better communicate the operations and features of this new type of facility.

TRUCK APRON

NEAR SIDE BIKE SIGNAL

FLEX SPACE LAY-BY

AERIAL DRONE FOOTAGE OF PROTECTED INTERSECTION

TRANSFERABILITY

The Bloor Street West Reconstruction project in Toronto serves as a valuable model for other Canadian jurisdictions aiming to enhance urban safety, accessibility, and sustainability. Key takeaways from this project that can be applied elsewhere include:

Main Street Trade-offs

The successful implementation of a protected intersection in a highly constrained downtown environment, like Bloor Street West, demonstrates that it is possible to implement these detailed designs in various right-of-ways with competing demands. The key is to balance these demands and commit to prioritizing the safety of vulnerable road users over other modes.

Constructing in Constrained Environments

Building a protected intersection in a geometrically constrained and highly traveled area demands careful planning. It's crucial to consider the sequencing of construction activities and disciplines to minimize the impact on traffic and pedestrians. This should be addressed during the design phase and clearly defined at the onset of construction, with contingency plans in place to manage potential risks.

Importance of Continued Consultation

Continued consultation with both internal and external stakeholders during the design and construction phases is critical to helping identify and address critical issues early on and to find the balance in design and delivery.

BLOOR STREET WEST RECONSTRUCTION

AVENUE ROAD AND SPADINA AVENUE

BLOOR STREET WEST RECONSTRUCTION

Avenue Road to Spadina Avenue

PROJECT BACKGROUND

Bloor Street West is an iconic main street within the City of Toronto, serving competing demands for transit access, mobility, public realm and active transportation connections. It serves as a major east-west arterial corridor running through Downtown Toronto. Between Avenue Road and Spadina Avenue, Bloor Street West is home to various businesses, neighbourhoods, and key destinations including the University of Toronto (UofT) campus and residences, the Royal Ontario Museum (ROM), the Bata Shoe Museum and the Royal Conservatory of Music.

Between 2020 and 2024, the City of Toronto, supported by WSP, redesigned and reconstructed Bloor Street West, from Avenue Road to Spadina Avenue, to enhance accessibility and safety for all road users.

BLOOR STREET WEST RECONSTRUCTION

Avenue Road to Spadina Avenue

INNOVATION: PROJECT BACKGROUND

Prior to the reconstruction, Bloor Street West was a heavily used travel corridor, carrying significant volumes of pedestrians, cyclists, and vehicles. In 2016, separated bike lanes with painted buffers and bollards were installed on Bloor Street West between Avenue Road and Shaw Street as part of a pilot project, which became permanent in 2017. These bike lanes led to a significant increase in cycling volumes along the corridor and enhanced comfort and safety for both motorists and cyclists. Despite these improvements, the section between Shaw Street and Avenue Road still experienced an average of 22 cyclist collisions annually, highlighting a safety issue that needed to be addressed. The decision to enhance safety along this corridor was further driven by a cyclist fatality at the intersection of St. George and Bloor Street West, which might have been prevented with a protected corner.

Planned watermain and subsequent road reconstruction work along Bloor Street West, between Avenue Road and Spadina Avenue, presented an opportunity to build to create a continuous, permanent cycling facility linking communities along the Bloor Street West corridor with the Downtown Core and address the safety concerns associated with the increasing cycling and pedestrian traffic, in alignment with the City's **VISION ZERO PLAN.**

In 2020, the City of Toronto, supported by WSP, began the planning and redesign of Bloor Street West between Avenue Road and Spadina Avenue. The process took three years of technical design, planning, and meaningful public engagement. Construction took place between 2023 and 2024 and included the following key elements:

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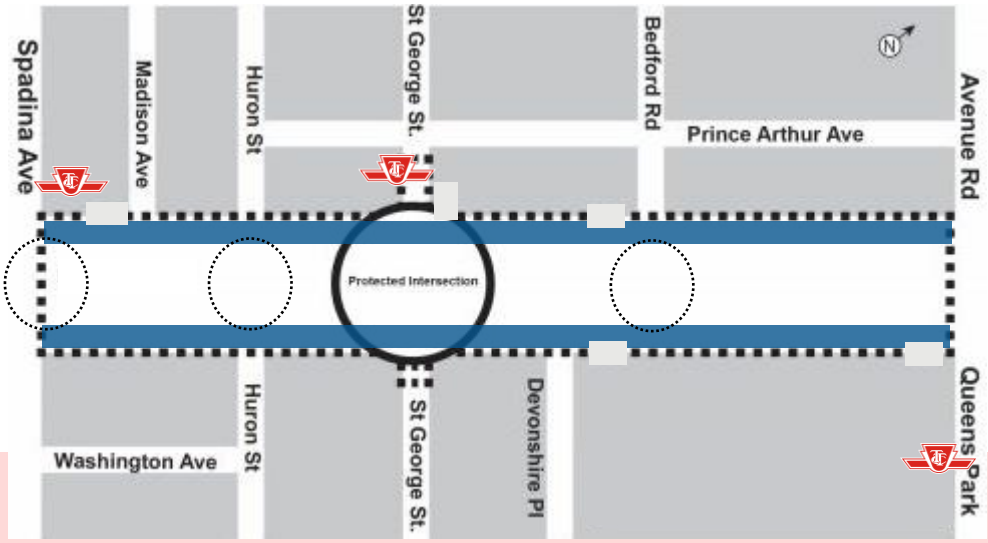


BLOOR STREET WEST RECONSTRUCTION

Avenue Road to Spadina Avenue

INNOVATION: KEY DESIGN ELEMENTS

Protected Intersection

Constructed at Bloor Street West and St. George Street, the protected intersection features set-back pedestrian and bicycle crossings, dedicated bike signals, signage, and modifications to traffic signal controls.

BEFORE CONSTRUCTION

RENDERING

1. Right turn lane with separate phase
2. Wide crosswalks
3. Corner protection island
4. Dedicated bike signals
5. Bikes yield to pedestrians
6. Mountable truck aprons
7. Cyclist queuing areas with forward stop bars

AFTER CONSTRUCTION

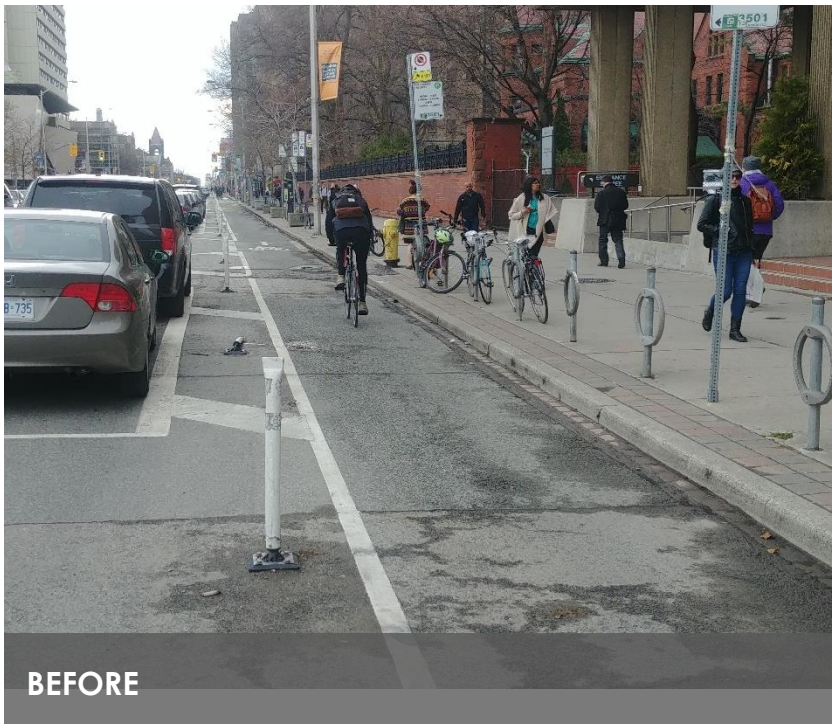
BLOOR STREET WEST RECONSTRUCTION

Avenue Road to Spadina Avenue

INNOVATION: KEY DESIGN ELEMENTS

Raised Cycle Tracks

The existing separated bike lanes were upgraded to raised cycle tracks, with on-street parking defined by precast concrete medians, barrier curbs between vehicle curb lane / parking, and bevelled (rolled) curbs between the cycle track and sidewalk for easier access across the cycle track for people using mobility devices.



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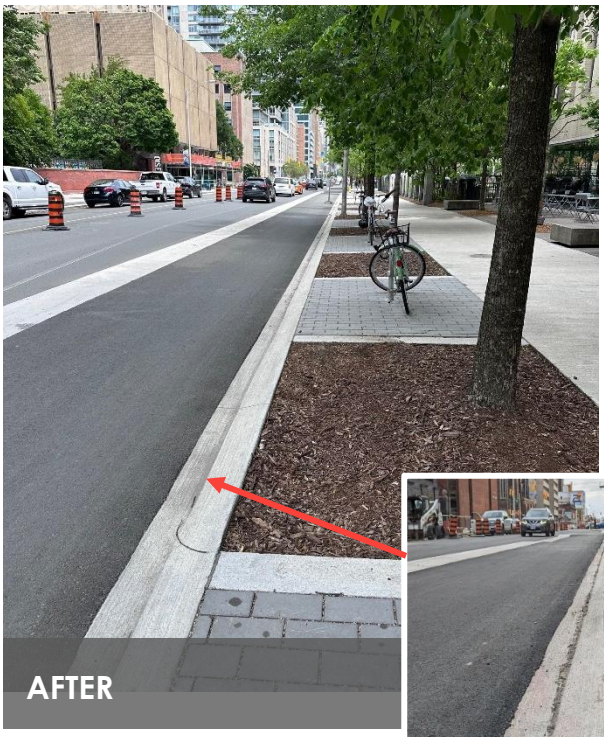

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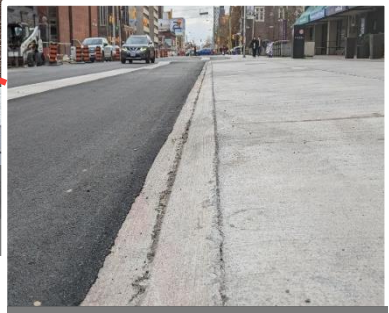
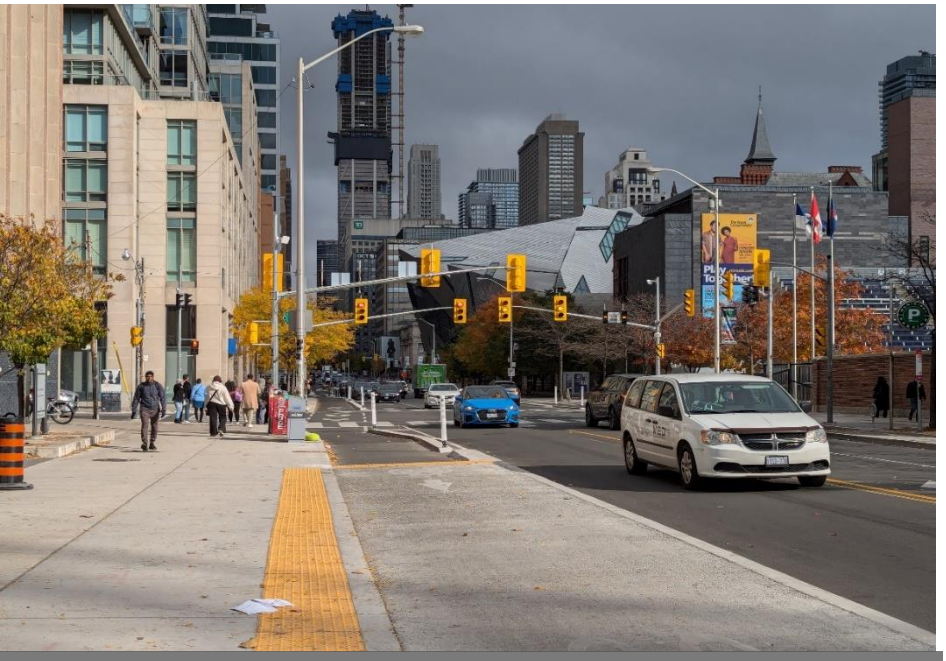


BEVELLED CURB



RAISED BUS STOP ALONG CYCLE TRACK

TRANSIT STOP UPGRADES

Transit stops were upgraded with raised platforms to accommodate the new cycle track. These platforms, up to 38 metres long, were added where buses pull up alongside the cycle track, meeting current accessibility standards.

The raised transit stop platforms are made of permeable concrete to allow for stormwater to infiltrate, eliminating the need for trench drains and avoiding conflicts with existing utilities.

BLOOR STREET WEST RECONSTRUCTION

Avenue Road to Spadina Avenue

INNOVATION: KEY DESIGN ELEMENTS

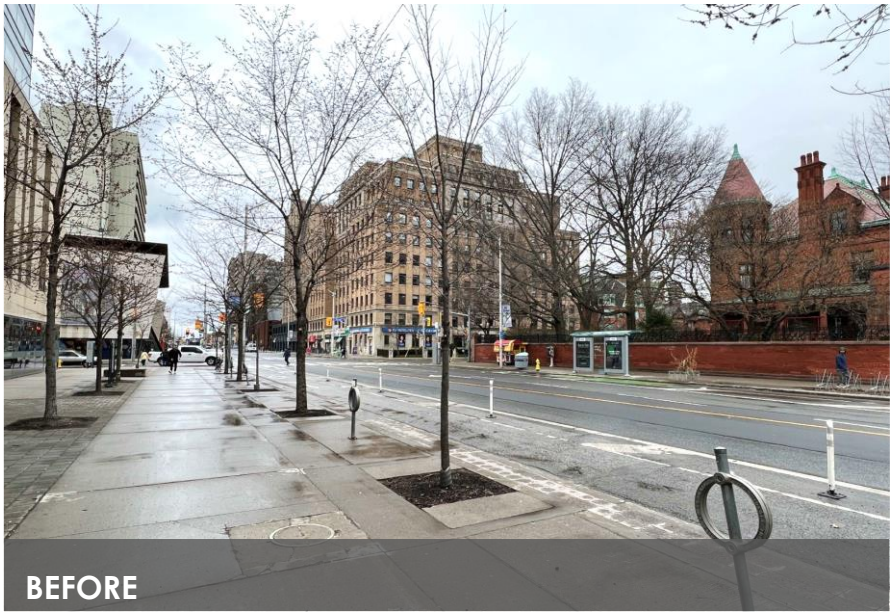
Sidewalk and Streetscape Improvements

Sidewalks were replaced and upgraded to meet current accessibility standards. Streetscape improvements enhanced the user experience throughout the corridor.

Green Infrastructure

Green infrastructure components were also installed along the corridor, in line with the City's Green Streets Technical Guidelines. Implemented green infrastructure features included permeable pavers, concrete bio-retention planters and systems, structural soil cells, and improvements to existing tree pits, among others.

BIORETENTION PLANTER SEPARATING THE CYCLE TRACK



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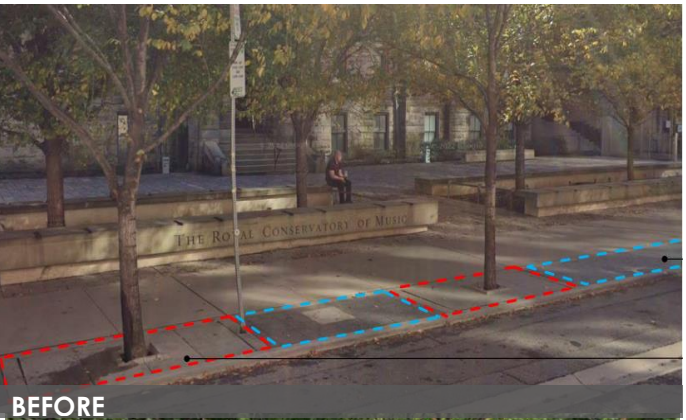

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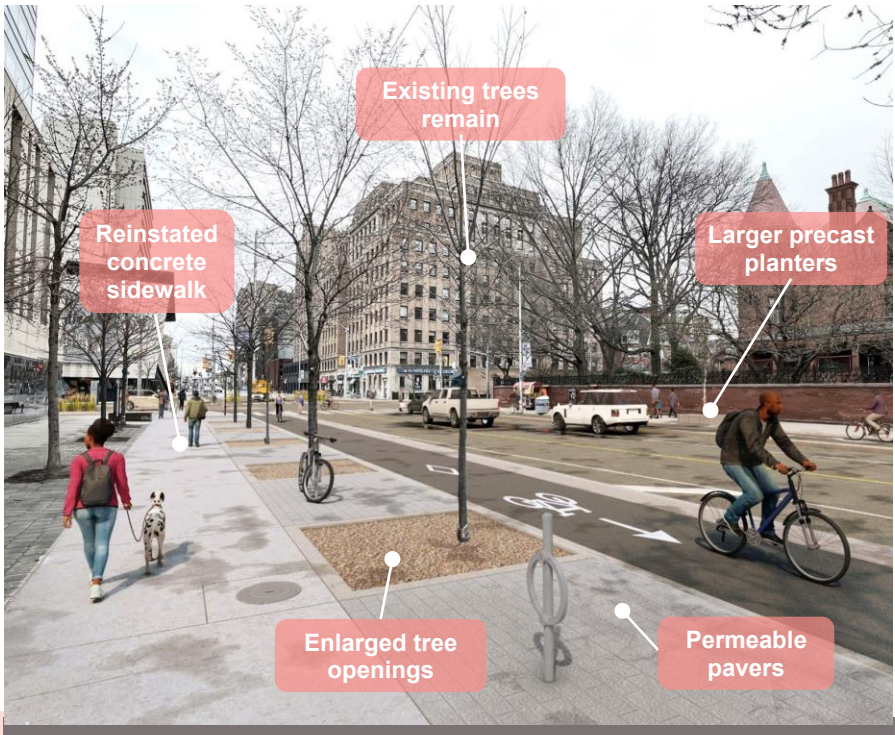


AFTER RENDER

BLOOR STREET WEST RECONSTRUCTION

Avenue Road to Spadina Avenue

INNOVATIVE APPLICATION

The Bloor Street Reconstruction project introduced several key innovative elements aimed at enhancing accessibility, safety, and sustainability. These include:

> **Reimagining the curb**

With the street reconstruction, there was an opportunity to rethink traditional road design to prioritize cyclist safety. Instead of the conventional approach of rebuilding the road in a similar way after watermain replacement and placing the bike lane on the street, the project team took advantage of the opportunity to develop a new design which moves cyclists behind the curb. This coordinated, proactive approach to bundling active transportation improvements with an already planned road reconstruction saved the City from future extensive construction activities needed to accommodate cyclists and increased pedestrian volumes.

> **Protected phase vs truck apron**

At the Bloor/St George intersection, truck aprons were incorporated into the design of three of the four corner islands. These aprons allow larger vehicles, like trucks, to make turns more easily while maintaining a compact intersection design. At the remaining corner, where transit vehicles make a right turn, a separate right turn phase was provided. This phase eliminates conflicts between turning vehicles and cyclists, ensuring safer interactions at the intersection.

TRUCK APRON

> **Near side bike signal heads**

The Bloor/St George intersection is the first location in Toronto to install near side 100mm bicycle signal heads. These signal heads are positioned to improve visibility for cyclists as they approach the intersection. With the cycle track aligned through the protected intersection, these supplementary signals reinforce the stopping location for cyclists before the crosswalk, enhancing safety and compliance with traffic signals.

NEAR SIDE BIKE SIGNAL

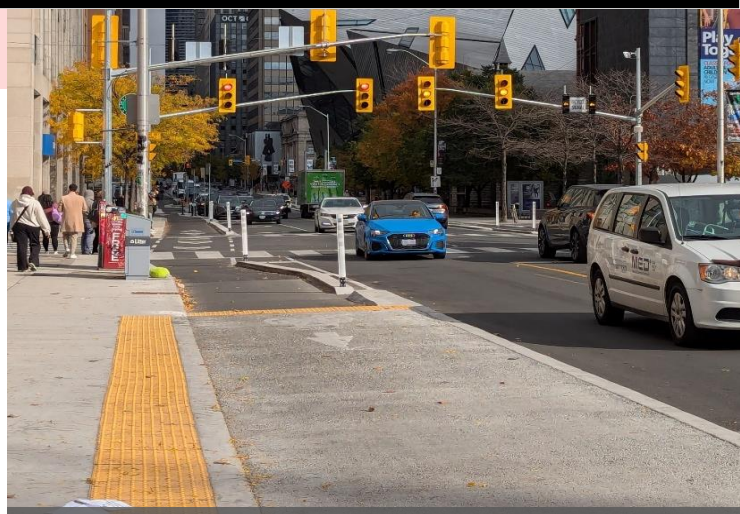
BLOOR STREET WEST RECONSTRUCTION

Avenue Road to Spadina Avenue

INNOVATIVE APPLICATION

> **Permeable concrete for bus platforms**

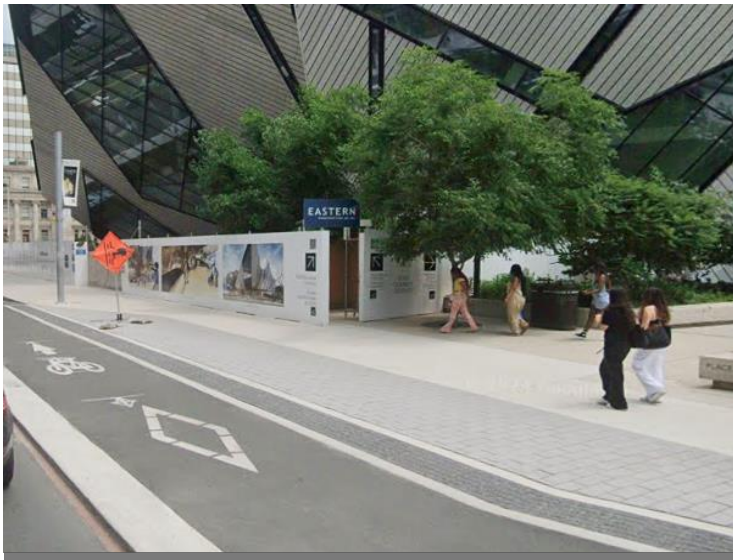
Underground utility conflicts at some of the raised transit stop platforms posed challenges with the standard design, which typically includes trench drains. To address these conflicts and ensure proper drainage without disrupting the cycle track alignment, permeable concrete surfaces were used. This innovative solution allows water to pass through the concrete, reducing runoff and maintaining the integrity of the cycle track.



BUS STOP WITH PERMEABLE CONCRETE

> **Flex space lay-by at ROM**

The Royal Ontario Museum (ROM) occasionally hosts events that require a pick-up/drop-off area. To accommodate this need, a lay-by area was created at sidewalk level, delineated with different materials and removable bollards. This design allows the space to function primarily as sidewalk space but can be converted into a pick-up/drop-off area when needed. This flexible approach ensures that the area can serve multiple purposes without compromising pedestrian accessibility.



FLEX SPACE LAY BY

> **Promotion with use of fly-though video**

Introducing new types of facilities, such as protected intersections, can be challenging for the public to visualize and understand. To enhance public engagement and promote the features of these new facilities, a "fly-through" video of the intersection was created. This video provides a virtual tour, helping residents and stakeholders better understand the operations and benefits of the protected intersection. It serves as an effective tool for communicating complex design elements and fostering community support.

AERIAL DRONE FOOTAGE OF PROTECTED INTERSECTION

BLOOR STREET WEST RECONSTRUCTION

Avenue Road to Spadina Avenue

COMPLEXITY

The Bloor Street West Reconstruction project in Toronto was an extremely complex project in a densely populated and narrow ROW that involved extensive consultation and collaboration with numerous stakeholders and the public. The following are key challenges for the project team:

Main Street Trade-offs

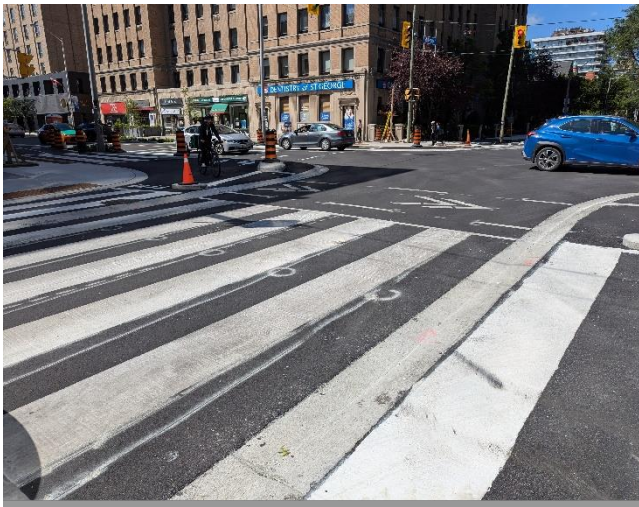
The successful implementation of a protected intersection in a highly constrained downtown environment, like Bloor Street West, was extremely challenging, but demonstrates that it is possible to implement these detailed designs in narrow right-of-ways with competing demands. The key is to commit to prioritizing the safety of vulnerable road users over other modes.

Constructing in Constrained Environments

Building a protected intersection in a geometrically constrained and highly traveled area demands careful planning. It's crucial to consider the sequencing of construction activities and disciplines to minimize the impact on traffic and pedestrians. This was addressed during the design phase and clearly defined at the onset of construction, with contingency plans in place to manage potential risks.

Balancing Multiple Needs in High Traffic Areas

Managing high volumes of traffic, including pedestrians, cyclists, transit, and motorists, in a constrained space was a significant challenge. With the UofT and TTC subway stations nearby, sidewalks and crosswalks needed to be wide enough to accommodate foot traffic. However, the corridor also serves as a main mobility route in the city, requiring a careful balance of space for all users.



EXTRA WIDE CROSSWALK

BLOOR STREET WEST RECONSTRUCTION

Avenue Road to Spadina Avenue

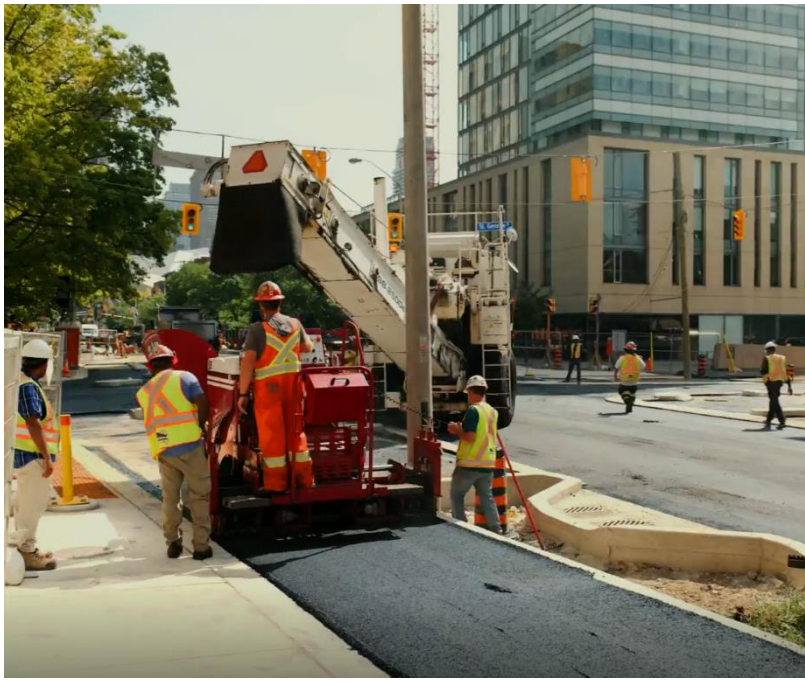
COMPLEXITY

Subway Shutdowns

Navigating both planned and sudden TTC subway closures presented another major challenge. With St. George Station located within the corridor and serving both Line 1 and Line 2, subway shutdowns necessitated the use of a large number of shuttle buses, which further congested the corridor. Coordinating designs to accommodate this increased activity, along with construction activities around these closures, required thorough planning and flexibility.

Accelerated Construction Schedule

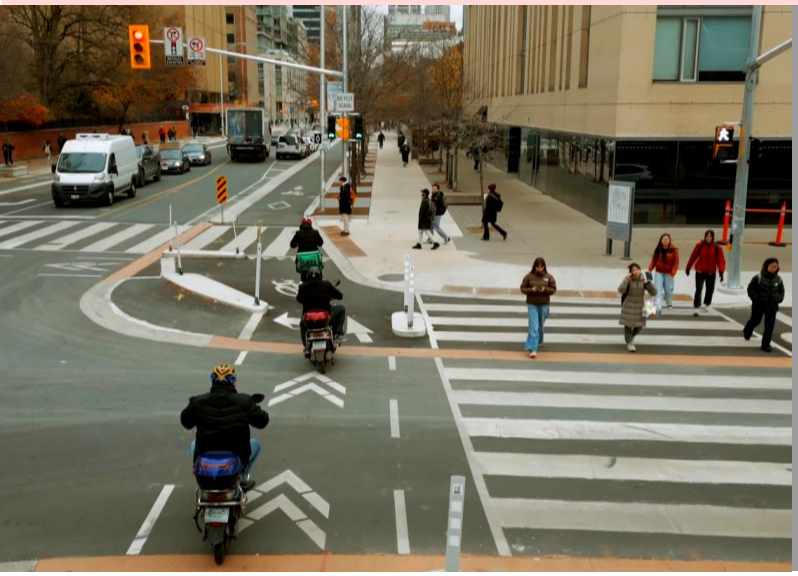
Initial estimates for the construction schedule anticipated the project would take two full construction seasons to complete, however, City requests to accelerate the implementation of road safety measures and minimize long-term disruption to a major arterial corridor required a unique staging plan. Through the development of a four-stage construction schedule and directional traffic closures, the project was able to complete substantial construction within 15 months.



BLOOR STREET WEST RECONSTRUCTION

Avenue Road to Spadina Avenue

SOCIAL AND ECONOMIC BENEFITS

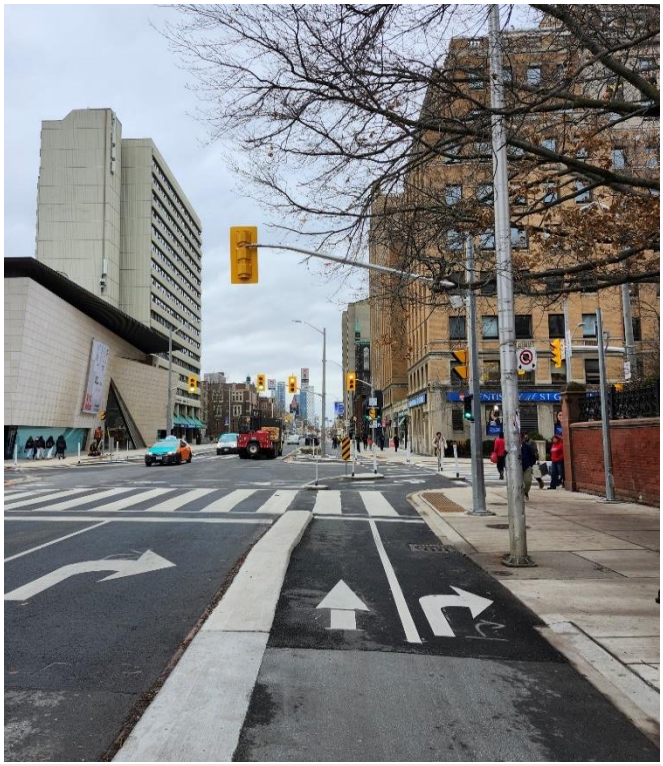


- Enhanced safety for all road users
- Enhanced mobility
- Improved accessibility
- Improved sense of place
- Economic Benefits

SAFETY AND MOBILITY

The project resulted in enhanced safety for all road users while improving walkability, bikeability, and accessibility throughout the corridor. When people feel safe to freely move around their community, they are more likely to use public spaces and enjoy their surroundings, leading to a more vibrant and connected community and overall enhanced quality of life.

The primary safety upgrade was the **protected intersection** at Bloor Street West and St. George Street. This intersection is at the heart of Canada's largest University, the University of Toronto. The high volume of turning movements by people driving, walking, and cycling makes this intersection an ideal candidate for a protected intersection. The decision to incorporate this design in such a constrained environment was also driven by an unfortunate cyclist fatality at the intersection, which likely could have been prevented with a protected corner.



The intersection's design enhances safety for cyclists and pedestrians in several ways:

- By providing greater separation from motor vehicles and reducing the likelihood of collisions.
- Improves sightlines for all users, forcing vehicles to be perpendicular to crossing pedestrians and cyclists.
- Tightened turn radii and corner islands naturally slow down vehicle speeds.
- Encourages predictable movements from all users.
- Shorter crossing distances reduce pedestrian and cyclist exposure to vehicle traffic.

BLOOR STREET WEST RECONSTRUCTION

Avenue Road to Spadina Avenue

SOCIAL AND ECONOMIC BENEFITS

The installation of raised cycle tracks also **enhanced safety and mobility**. The corridor experiences significant volumes of cyclists; the reconstruction of Bloor Street West upgraded the existing separated bike lanes to a raised cycle track design, further improving road safety along the corridor for all users by providing greater separation from vehicles. Bevelled (rolled) curbs were used between the cycle track and the sidewalk, allowing access across the cycle track for people using mobility devices.

RAISED CYCLE TRACK

ACCESSIBILITY

The pedestrian realm was made more accessible to more users through sidewalk improvements and accessibility upgrades to meet current standards. Transit stop upgrades also keep the bikeway clear for cyclists while providing sidewalk-level access for people boarding and exiting TTC buses. Making spaces accessible to more people ensures that everyone, regardless of physical abilities, can participate in and enjoy public spaces, enhancing the quality of life for even more individuals.

PLACEMAKING

Streetscape interventions along Bloor Street West serve as vital public spaces that integrate both aesthetic and functional enhancements, working together to create a **sense of place and an attractive public realm**. These improvements encourage people to spend time outdoors, engage with their community, and promote community well-being. The additional pedestrian space and green infrastructure components made the corridor more visually appealing and comfortable to move in, leading to more social interactions and cohesion. Public realm improvements like these **create inviting spaces**, making Bloor Street West more pleasant for residents, students, and visitors.

ECONOMIC

Enhanced pedestrian spaces and mobility corridors **contribute to the city's economic well-being**. Places that are safer, accessible, and have a sense of place attract a wider range of visitors, which can boost local economies by increasing foot traffic and encouraging tourism. People are also more likely to invest in areas where they feel secure, leading to increased economic development and job creation.

Construction concluded just this past year; however, economic impact studies in the area that had been conducted previously reveal the significant economic gain for local businesses after the original bike lanes were installed. This included more customers, and customers returning more frequently. Given this, it can be assumed that further enhancements to the cycling and pedestrian realm along the corridor will result in even more business for the local businesses.

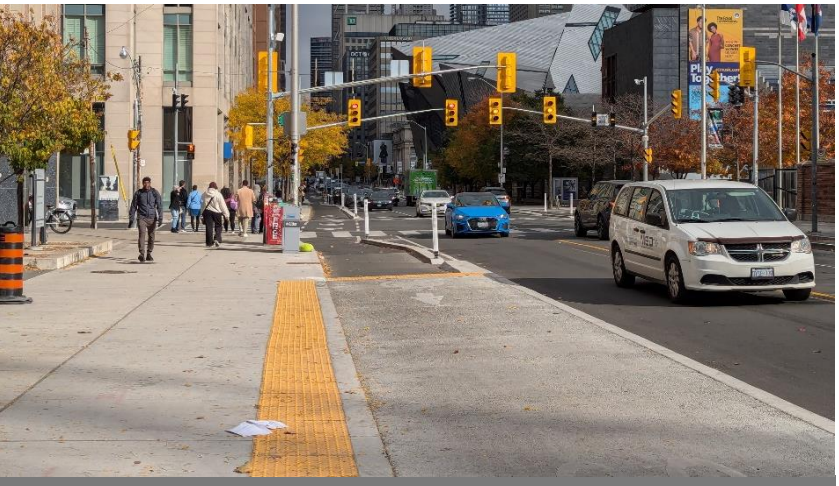
ENVIRONMENTAL BENEFITS

GREEN INFRASTRUCTURE

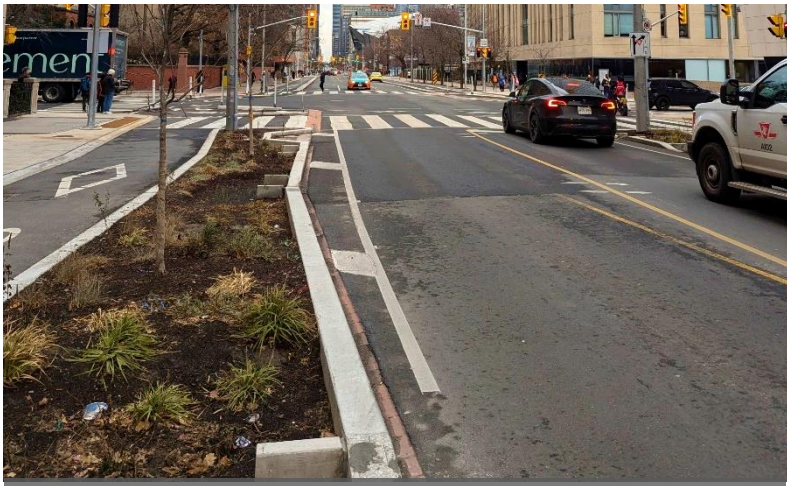
Function and aesthetic green infrastructure features were incorporated into the corridor's design, working together to create **an attractive, sustainable public realm**. As discussed in the project overview, several Green infrastructure elements were installed along the corridor to support the environmental goals of the City, including managing stormwater runoff, improving air quality, and reducing the urban heat island effect.

Green infrastructure components installed along the corridor include the following:

- **Enlarged tree pit openings:** Expanding existing tree pit openings to improve overall health of trees by increasing oxygen, water filtration and biological activity.
- **Permeable Pavers:** Replaced existing non-porous paving between trees with permeable pavers to provide passive irrigation via rain runoff within the tree root zones.
- **Enlarging planters:** Upgraded existing small precast planters with slightly larger ones to increase soil volume of each tree.
- **Bioretention planters:** Constructed bioretention planters on the north side of Bloor St West in front of Exhibit Condo and at TTC platform locations at St George Street and Madison Avenue. Bioretention planters also increase planting biodiversity, provide traffic calming, and aesthetic benefits.
- **Permeable asphalt at bus stops**: Installed permeable asphalt at key TTC platform locations that will allow stormwater to filter into the ground, in lieu of trench drains and avoid conflict with existing utilities, reducing the volume and speed of runoff into the City's storm sewer system.



PERMEABLE CONCRETE AT TTC BUS STOPS



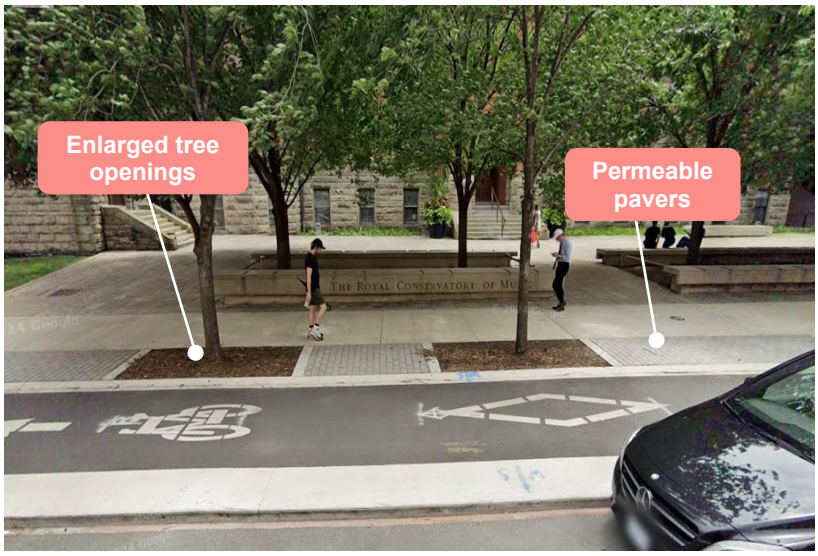
BIORETENTION SYSTEM AT BLOOR/ ST. GEORGE ST

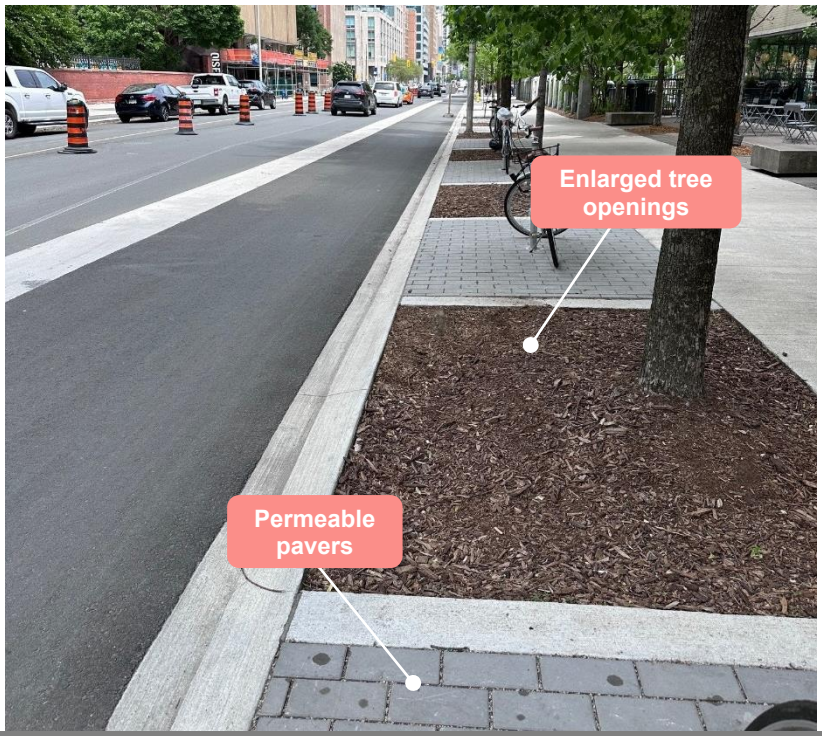
BLOOR STREET WEST RECONSTRUCTION

Avenue Road to Spadina Avenue

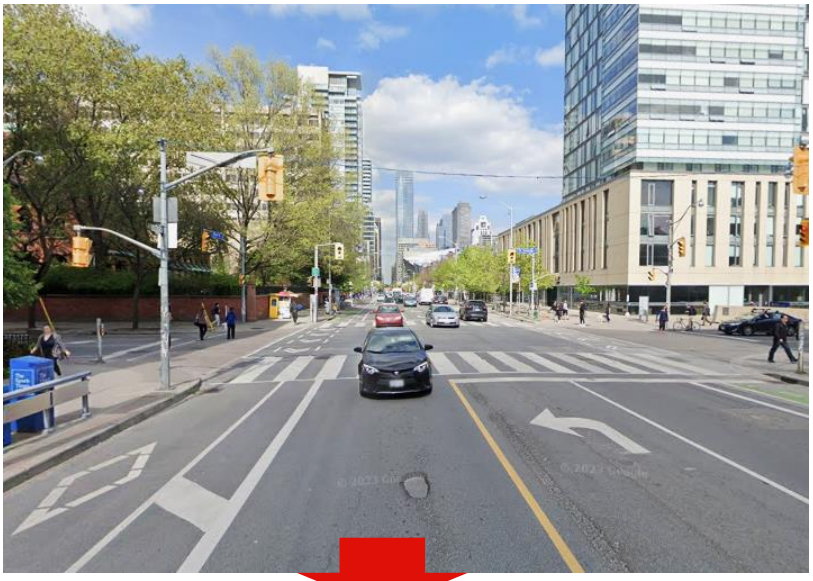
REDUCING EMISSIONS

The project contributes to the city's environmental well-being by promoting the use of active transportation, micromobility, and transit, reducing individuals' dependence on vehicles and the overall emissions and carbon footprint. This also improves air quality, noise pollution.





ENLARGED TREE OPENINGS AND PERMEABLE PAVERS



BIORETENTION SYSTEM AT BLOOR/ ST. GEORGE ST

BLOOR STREET WEST RECONSTRUCTION

Avenue Road to Spadina Avenue

MEETING AND EXCEEDING CLIENT'S NEEDS

Through the reconstruction of Bloor Street West, the primary goals of the client were to **create a continuous, permanent cycling facility linking communities** along the Bloor Street West Corridor with the Downtown Core **and address the safety concerns** associated with the increasing cycling and pedestrian traffic, in alignment with the City's Vision Zero Strategy.

WSP achieved these goals to the client's satisfaction through the development of a fully raised cycling facilities and protected intersection, creating physical barriers to separate vehicles, cyclists and pedestrians, and improving visibility for vehicles turning. The reconstructed corridor between Spadina Avenue and Avenue Road completes the upgrade of the Bloor Street Bike Lanes Pilot Project to permanent facilities and provides a connection to major cycling corridors, subway stations along the Yonge-University Line, and key destinations such as Queen's Park, the UofT and the Royal Ontario Museum.

The construction schedule initially anticipated that the project would take two full construction seasons to complete. However, the City requested that road safety measures be implemented more quickly and that long-term disruption to a major road be minimized. To meet these requests, WSP created a unique staging plan. By dividing the project into four stages and using directional traffic closures, the project was able to complete most of the construction in just 15 months instead of the initially planned two seasons.

Watermain Rehabilitation Program, Toronto Water

Since 2015, WSP has proudly been the City's trusted partner, managing the largest annual Watermain Rehabilitation Program in North America.

Currently delivering its fourth consecutive 3-year assignment, WSP is successfully helping the City achieve its goal of reducing annual watermain breaks and improving the reliability of the water distribution network. This is accomplished by rehabilitating existing watermains using Cured-in-Place Pipe (CIPP) lining methodology and through the installation of sacrificial anodes on existing pipelines.

Over the past decade, WSP's team of dedicated program managers, engineers, lining experts, contract administrators, inspectors, and field ambassadors has collaborated with the City to accomplish:

- The management of **$600 Million** in capital spending across over 50 construction contracts on necessary infrastructure renewal.
- **260 km of CIPP watermain lining** (~5% of the City's distribution network) across 300 different work sites.
- Replacement of **8,000 substandard water services** including removal of 1,700 lead (Pb) services.
- Installation of sacrificial anodes to **1,000 km** of watermain to prolong service life by **cathodic protection.**

Recognizing the importance of high-quality work and customer service, WSP has invested in digital solutions *specifically* for the City. These include:

1. A communication management dashboard system to track and manage public enquiries. WSP's dedicated Field Ambassadors have responded to **14,000 public enquiries** relating to the to the work on this program diverting countless calls that would otherwise consume City resources.
2. A pipeline CCTV video inspection environment, *PipeTube,* trained to identify defects specifically pertaining to CIPP watermain installations. This has saved the City 30-50% of CCTV inspection effort.
3. A GIS-based design environment, *GeoRehab* to improve the efficiency of the design and tender preparation process. This results in an annual savings of over 20% design effort. Additionally, the expedited design process affords the City agility to make changes to the program to **quickly respond new threats** arising from unplanned watermain breaks.

With the RFP for the 2027-2029 program anticipated soon, WSP is eager to respond to the City's call and is hopeful to be selected to continue delivering this important work for the community.

Client Testimonials

Arthur Sinclair, former Senior Project Manager, Toronto Water, December 2022

“As we end another successful year of the Watermain Structural Lining Program, I want to thank the WSP team for their hard work and dedication. The team's efforts are helping to make a healthier, more resilient City of Toronto. Together we are building for the next generation.

The team at WSP has made managing a difficult program look easy. I came into this program mid-August during a period with some of the most action. When I arrived, I found a self-sufficient well-oiled machine of designers, contract administrators, inspectors and project managers advancing a program.

I have learned a lot from the team and am grateful for all the care you took to integrate me into it. I genuinely feel like part of a team that is doing great things. Thank you again and here's to another successful program in 2023.”

Mike Klipina, C.E.T, former Senior Project Manager, Toronto Water, April 2018

“Hello Hugo Blasutta/ Joe Sframeli

I would like to send you the consultants performance evaluation form that was carried out on your team for the above RFP.

I would like to say that your team have been quite exceptional on this program.

The team work, dedication and high quality of work has been very much appreciated. In today’s world when the quality of work has been going down, it is refreshing to see WSP raise the bar above all the others.

I am very happy that we are working together for another few years on the CIPP/CP program

Well Done 😊

Thank You”

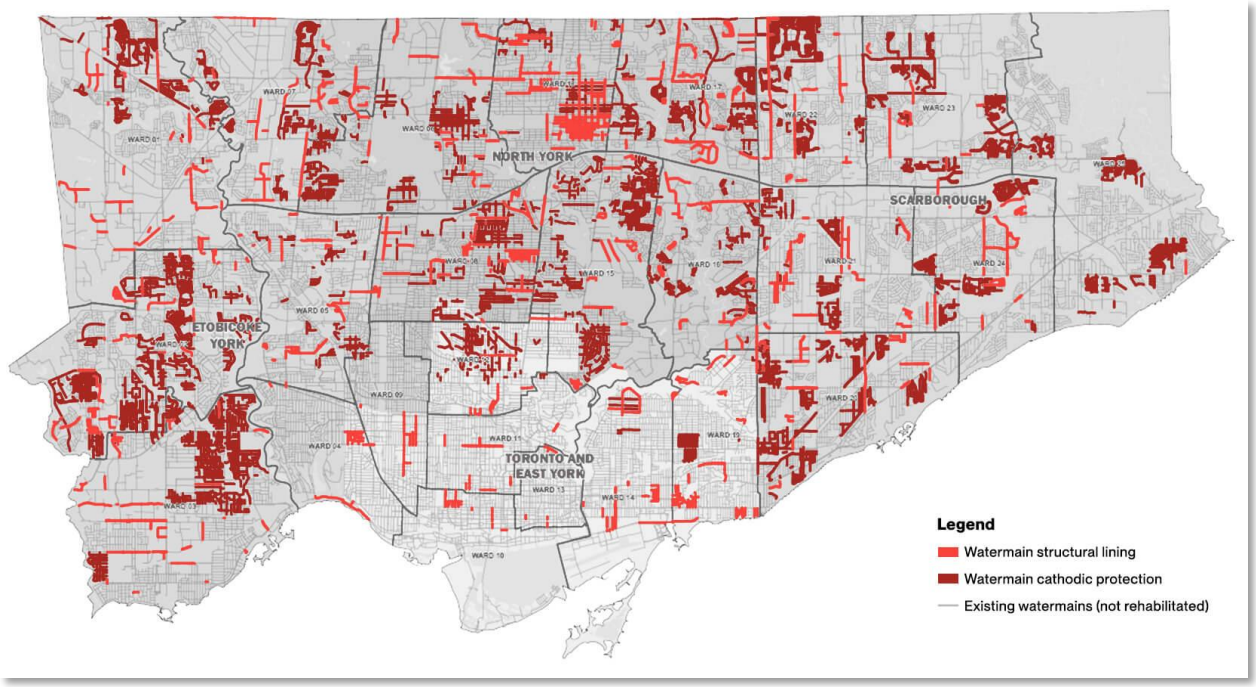
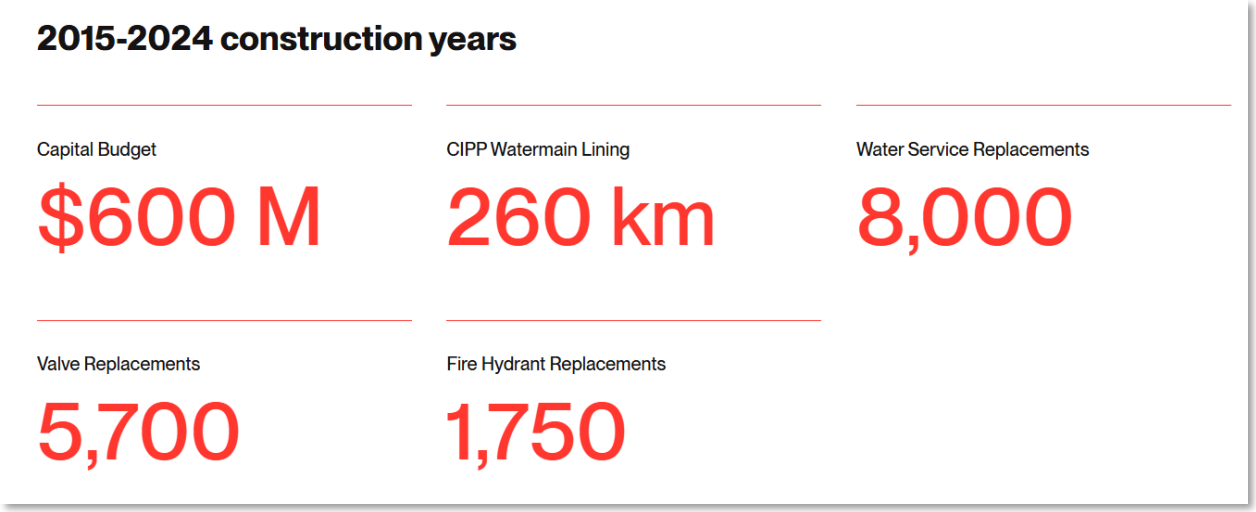


Illustration of the impact to the City's watermain network WSP has had over the past 10 years



Key statistics 2015-2024

Learn more on our website: [City of Toronto Watermain Rehabilitation Program | WSP]

Confidential

Representative City of Toronto Client Projects

(Transportation Planning, Municipal Roads, Bridges and LDME)

1. Bloor Street Reconstruction and Protected Intersection (construction completed 2024)

Prior to the reconstruction, Bloor Street West was a heavily used travel corridor, carrying significant volumes of pedestrians, cyclists, and vehicles. With an average of 22 collisions involving cyclists each year in the section between Shaw Street and Avenue Road, this area represented a documented safety concern. In 2016, separated bike lanes with painted buffers and bollards were installed on Bloor Street West between Avenue Road and Shaw Street as part of a pilot project, which were made permanent in 2017. These bike lanes led to a significant increase in cycling volumes along the corridor and enhanced comfort and safety for both motorists and cyclists. Planned watermain and subsequent road reconstruction work along Bloor Street West, between Avenue Road and Spadina Avenue, presented an opportunity to build on this success to further enhance safety for pedestrians and cyclists and reduce risk for all road users. This initiative aligned well with the City's commitment to its VISION ZERO PLAN.

In 2020, the City of Toronto, supported by WSP Canada, began the planning and redesign of Bloor Street West between Avenue Road and Spadina Avenue. The process took three years of technical design, planning, and meaningful public engagement. Construction took place between 2023 and 2024, and included the following key elements:

- Reconstruction of the concrete road base and replacement of the asphalt road surface
- Sidewalk replacement and accessibility upgrades to meet current standards
- Installation of permanent raised cycle tracks
- Construction of a protected intersection at Bloor Street West and St. George Street
- Transit stop upgrades
- Streetscaping improvements and installation of green infrastructure features

The project resulted in enhanced safety for all road users, while improving walkability, bikeability, and accessibility throughout the corridor. The primary safety upgrade was the protected intersection at Bloor Street West and St. George Street. This intersection is at the heart of Canada's largest University, the University of Toronto. The high volume of turning movements by people driving, walking, and cycling makes this intersection an ideal candidate for a protected intersection.

Construction was completed in 2024 and at the request of City staff, WSP then assisted the City of Toronto in the preparation of an Award Submission for this project to the Transportation Association of Canada. The submission was short-listed by TAC and then a detailed award submission was prepared by City and WSP staff. The results will be made public at the TAC annual conference in October of 2025. Attached is the Award submission and the following are two quotes from the City's Project Manager (original email with quote attached)

Project:

"I have reviewed the draft final invoice (#23) for Bloor/St George Intersection design/construction and confirm that it is approved to submit to APinvoice for processing. Thanks for all your great work on this project!"

Award Submission:

"I want to first thank you and your team for all the great work and effort you have put to pulling this all together on such short notice. It looks really good and I only have a few suggested edits (see attached)."

David Dunn, Senior Project Manager , Cycling and Pedestrian Projects Unit, City of Toronto, (416) 392-8985

2. The Queensway Preliminary Design (2022-23)

The Queensway Complete Street Project is a significant initiative aimed at transforming The Queensway in Toronto into a more accessible and safer corridor for all users, including pedestrians, cyclists, and motorists. Public presentations have been made to share the project's progress and gather input from the community. Regular communication with the City of Toronto and other stakeholders has been maintained throughout the project. The project successfully delivered the 30% design for the City of Toronto, which has been handed off to the City's Engineering & Construction Services (ECS) for detailed design. **WSP submitted a proposal for detailed design for this same project in late 2024 and was awarded the project, confirmed at the City's Bid Award Panel on March 26th, but we are still awaiting the contract (https://secure.toronto.ca/council/agenda-item.do?item=2025.BA125.1).**

Adam Popper, Manager (Acting), Cycling and Pedestrian Projects, Transportation Services, Adam.Popper@toronto.ca

3. Dunn and Dowling Bridge Feasibility Study (2023-2024)

The Dunn and Dowling Bridge Feasibility Study is a comprehensive project aimed at evaluating and establishing preferred design options for replacing the current temporary bridges at Dunn Avenue and Dowling Avenue in Toronto, Ontario. The study focuses on providing long-term solutions for these key waterfront connections over the GO Transit Lake Shore West corridor and Gardiner Expressway1.

Key Aspects of the Study:

- Bridge Types and Alignments: The study evaluated alternative structure types, alignments, and cross-sections for both bridges. The Dunn Avenue Bridge accommodates pedestrians, cyclists, and motor vehicles, while the Dowling Avenue Bridge is dedicated to pedestrians and cyclists only.
- Pedestrian and Cyclist Experience: The feasibility study considered ways to improve the experience for pedestrians and cyclists, including accessibility and safety countermeasures.
- Traffic and Connectivity: The study also looked into traffic operational improvements and active transportation connectivity.
- Cultural Heritage and Public Space: Considerations were made for cultural heritage, landing areas, and public space enhancements.
- Public and Stakeholder Engagement: Technical advisory meetings with Metrolinx were conducted to ensure alignment and address any technical concerns. Meetings with the Toronto Community Housing Corporation (TCHC) and the public were also part of the collaborative efforts to discuss the bridge replacement feasibility.

The project was co-presented by WSP (Shawn Smith) and the City of Toronto (Liz Trenton) at the 2023 TAC Conference, highlighting the design concepts and background information for both Dunn and Dowling bridges.

Liz Trenton from City of Toronto has responded to the Voice of the Client Survey in Q4 2023 and rated the project 19M-00522-14 - Dunn & Dowling Bridge Replacement as **"Meeting Expectations"** and gave it a Net Promoter Score (NPS) of **9 (Promoter).**

The client selected **Quality of Work** as the main driver of their response.

"It's been great working with WSP on this file. The quality of work is excellent, communications is great. Would enjoy working with WSP and this team again."

Regarding the follow-up NPS question, "What do you like most about our company/product/service?," here is the client's response (if provided): ***"The staff and team."***

Liz Trenton (She/Her), Senior Project Manager, Major Projects, Transportation Services, City of Toronto, Liz.Trenton@toronto.ca

4. Martin Grove Cycling Connections Functional Design (2022-2024)

The Martin Grove Road Cycling Connection project envisions a continuous all-ages-and-abilities cycling facility in Toronto's west end, spanning from Kipling TTC/GO station to the future light rail station at Eglinton Avenue. Running five kilometres through a range of contexts, the project is a case study in context sensitive design and involves many unique elements.

WSP's scope for the project involved the 10% and 30% design of six segments totaling 2.6 km including four signalized intersections, one bridge, and one trail segment. The corridor includes a complex and varying context that transitions from a local street at the south end to a major arterial road at the north end. Implementing a continuous, comfortable cycling connection required different approaches for each context. Along the local street portion, traffic diversion measures were proposed to reduce volumes to levels appropriate for mixed-traffic cycling. One design segment included a bridge structure and required a structural assessment, while another segment featured a multi-use pathway going through a local park. Close consultation with the various external stakeholders, collaboration within the internal multi-disciplinary team, as well as engagement with local communities were critical early components that lay the foundation for the project's success. WSP produced presentations, maps, posters, and renderings to support the City-led public consultation activities.

At intersections, protected intersection elements were incorporated to improve safety for vulnerable road users such as setback crossings and protected signal phasing. Left turn calming treatment was included at some signalized intersections to reduce the risk of left-turn collisions. The treatment involves installing raised asphalt humps or raised concrete medians in the roadway to harden the centreline and encourage motorist to take turns at sharper angles and lower speeds, while still providing enough space for the occasional large truck.

Reduced corner radii were included where feasible, and intersection accessibility was proposed to be improved by installing curb ramps, tactile walking surface indicators, and accessible pedestrian signals.

Signal phasing improvements at intersections were investigated and adopted to prioritize cyclists and pedestrian movements including leading pedestrian/bicycle intervals, prohibited right-turn-on-red, and fully protected left and right turn signal phasing.

WSP also prepared the detailed design for the Martin Grove/Burnhamthorpe intersection, which the City plans to take to construction in 2025.

WSP (Riccardo Caimano) co-presented this project with the City of Toronto (Kanchan Maharaj) at the ITE/CARSP Conference in 2023.

Stephen Gagne, P.Eng, Senior Engineer, Cycling and Pedestrian Projects, Transportation Services, Stephen.Gagne@toronto.ca

5. Etobicoke Hydro Corridor Trail Feasibility Study (2023-2024)

The Etobicoke Hydro Corridor Trail Project is a significant initiative aimed at developing a multi-use trail within the existing Etobicoke Hydro Corridor to enhance connectivity and accessibility in Toronto's northwest area. The project involves thorough feasibility reviews, stakeholder engagement, and technical evaluations to ensure a well-planned and sustainable trail.

Here are the key aspects of the project:

- The trail is approximately 2.5 kilometers long, stretching between Albion Road in the north and Kipling Avenue in the south.
- This trail will provide a vital connection in Toronto's northwest area, improving access to amenities such as the Humber River trail system, transit, schools, and parks.
- The feasibility review and functional plan development aim to assess the existing conditions of the study area, including key crossings and connections, natural and built heritage, cycling and transportation connections, utilities, drainage, and public realm enhancement.
- Stakeholder workshops were conducted to gather input and provide updates on the project.
- Regular communication with stakeholders, including the City of Toronto, Hydro One, and other relevant parties, has been maintained throughout the project.

The project successfully delivered the functional design for the City of Toronto, which has been handed off to the City's Engineering & Construction Services (ECS) for detailed design.

Jennifer Hyland, Transportation Services, Jennifer.Hyland@toronto.ca

6. Mill-Esplanade Bikeway (2021-2025, construction in 2022, 2025)

The Mill-Esplanade Bikeway project is a significant initiative aimed at enhancing cycling infrastructure and improving safety and accessibility for cyclists and pedestrians in Toronto. The project involves multiple phases, stakeholder engagement, coordination with adjacent projects, and careful consideration of technical aspects. Here are the key aspects of the project:

- The project involves the design and implementation of a protected bidirectional bikeway mostly within existing curb lines between Yonge Street and Bayview Avenue
- The design includes pedestrian infrastructure improvements and changes to motor vehicle traffic and transit to support the bikeway
- Phase 1 of the project included improvements to two signalized intersections and a new cycling pathway through Parliament Park, and has been constructed.
- Phase 2 included preliminary design for the segment from Yonge Street to Berkley Street, and detailed design from Market Street to Jarvis Stret. Phase 2 was successfully delivered to the City, and is currently under construction

Adam Popper, Manager (Acting), Cycling and Pedestrian Projects, Transportation Services, Adam.Popper@toronto.ca

7. Leaside Bridge Structural Assessment for Bike Lane Upgrades (2023-2024, construction 2025)

The historic Leaside Bridge on Millwood Road from Overlea Blvd to the Pape Avenue/Donlands Avenue intersection now has a west side bi-directional cycle track and an east side uni-directional cycle track. WSP led a structural engineering assessment of this and three other bridges to determine the potential impact of installing concrete barriers. We reviewed barrier options and ultimately recommended the MTOD Type Z for its crash protection, narrow footprint, drainage conveyance, and other factors. The bike lane upgrades on Leaside Bridge enhance safety, comfort and connectivity for active transportation users.

Adam Popper, Manager (Acting), Cycling and Pedestrian Projects, Transportation Services, Adam.Popper@toronto.ca

8. OTM Book 18 Training (2022)

On Feb 22 and March 2, 2022, WSP staff trained 163 City of Toronto staff from Engineering & Construction Services, Transportation Services and City Planning Division for a full day in the use of the updated Ontario Traffic Manual Book 18: Cycling Facilities manual, the primary cycling design guidelines used by Ontario municipalities.

- *Thanks a lot. Very informative!! great part you have shared examples.* – Haseeb Zehra
- *Great presentation and information!!* – Jawaid Choudhary
- *Great job gents, thanks for a great session!* – Benjamin Morell
- *Thank you, it was very useful training.* – Bahareh Karbasi-Ravari
- *Thanks Shawn, James, Matt, and OTC for hosting and organizing!* – Owen McGaughey
- *Thanks, very informative session*. – Arshad Nazir
- *That was great* – Jen Hyland

9. Davenport Accessible Bus/Bike Platforms

WSP was awarded a $500k contract to develop a standard design for accessible bus/bike platforms, and to complete preliminary, detailed design, and CA for approximately 40 of these platforms along the Davenport Road corridor. The project is complete, however

the City approached WSP with a small ($20k) add-on assignment to make use of the remaining contingency available in the project budget. The City has expressed satisfaction with WSP's work, and we have had a friendly and open relationship in navigating several major scope changes on this project. Client PM: Kanchan Maharaj, Transportation Servies, Kanchan.Maharaj@toronto.ca

10. John Street Corridor Improvements

MMM was awarded the John Street Corridor Improvement mandate in 2014; EA having been completed by others circa 2010-2012. The bulk of our design development occurred 2014 to 2015, and in June 2016 we went 'pens down' and turned over a set of plans notionally stamped as IFC but understood by both MMM/City that additional work was required on the City's part to properly prepare the street and project for construction. There was public consultation included with various stakeholder meetings, a design review panel, open houses, and these types of events with the BIA included to land the design

Since 2016 the WSP team has been supporting the project along with team subs DTAH and DPM to obtain signed CUPs (in 2019) and make various presentations over the years to the City as they gather funding required to implement the project. In 2022, the City direct awarded a PO to our team for about $700k to continue our 'agile support' (T&M) of the project, which we have been doing. Currently targeting completion and re-issue of IFCs in summer 2025.

City PM Scott Mitchell has been in command of this project since inception (within months of starting). He also was PM for the EA done by others. Scott has been a supportive client and there is a great working relationship between his team ("Special Projects and Streetcar Way" in ECS) and the WSP/design team. Feedback has been very positive, with the City PM noting that WSP has performed well.