Complete Streets by Design

Toronto streets redesigned for all ages and abilities

Complete Streets

tcat toronto centre for active transportation

Clean Air Partnership

CONTRIBUTORS

Design + Illustration	Chris Hardwicke, Anne Malee van Koeverden, Caroline Schutrumpf
Graphic Design	Caroline Schutrumpf
Image Curation	Sam Schachar
Photography	Chris Hardwicke, Ryan O'Shaughnessy
Writing	Caroline Schutrumpf, Thomas Smahel, Nancy Smith Lea
Advisory Committee	Chris Hardwicke Elana Horowitz Neluka Leanage Thomas Smahel Nancy Smith Lea Darryl Young
Community Consultation	*Many thanks to everyone who provided feedback throughout this process, Including, but not limited to:* 8-80 Cities Cities Centre City of Toronto staff Toronto Cyclists Union Walking Toronto + dozens of other professionals and members of the public.

CONTACT

Visit ***www.tcat.ca*** or ***www.completestreets.ca*** for more information.

Toronto Centre for Active Transportation
75 Elizabeth Street
Toronto, ON M5G 1K4
Canada
416-392-0290
info@tcat.ca

ACKNOWLEDGEMENTS

Complete Streets by Design was selected as a 2011 Vital Ideas Award Recipient. This award has been provided through the Vital Toronto Fund at the Toronto Community Foundation.

The Vital Ideas grants are awarded to high-impact programs or organizations that are currently in operation and that have a solid track record of success making Toronto a better place to live, work, learn and grow.

TORONTO COMMUNITY FOUNDATION
The Art of Wise Giving™

TABLE OF CONTENTS

ABOUT TCAT

At TCAT, everything we do is motivated by our vision of cities that are safe, convenient, and enjoyable for walking and biking. We believe that active transportation is central to making vibrant and economically competitive cities that are also sustainable, accessible, and healthy for all.

MISSION STATEMENT

The Toronto Centre for Active Transportation (TCAT) works to create a better city for cycling and walking.

MANDATE

1. To conduct research, develop policy, and create opportunities for knowledge sharing, all with the goal of providing evidence and identifying workable active transportation solutions
2. To work with municipalities and other governments and agencies to influence decision-making
3. To identify opportunities to engage the public in the municipal process through informed debate

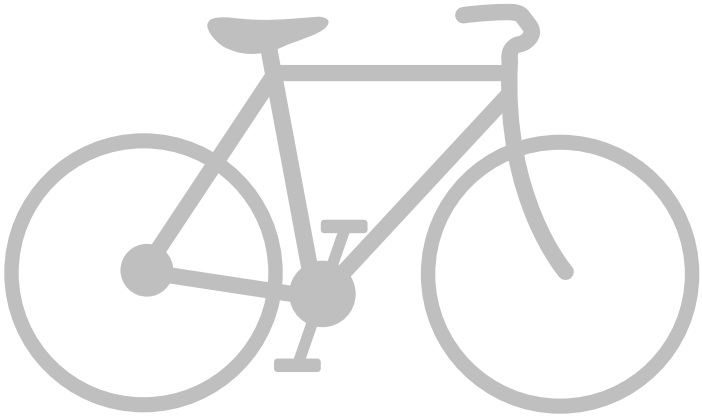
HISTORY

The Toronto Centre for Active Transportation (TCAT) was formed in 2006 to give a unified voice to the many groups working for a better cycling and pedestrian environment in Toronto.

TCAT has worked closely with the Clean Air Partnership (CAP) since its inception, became a project of CAP in 2008, and now guides CAP's active transportation programming. CAP is a registered charity that was launched in June, 2000.

Clean Air Partnership's mission is to transform cities into sustainable, vibrant, resilient communities, where the air is clean to breathe and greenhouse gas emissions are minimized. CAP works with partners to achieve clean air, facilitate the exchange of ideas, advance change and promote and coordinate implementation of actions that improve local air quality.

TCAT has evolved from a grassroots advocacy group into a research and education organization since becoming a project of CAP. As a result, TCAT celebrated its fifth birthday in 2011 by changing its name from the Toronto Coalition for Active Transportation to the Toronto Centre for Active Transportation.



FOREWARD

Complete Streets by Design is a tool to build public and professional support for Complete Streets. Applying established Complete Streets principles to Toronto streets in both urban and suburban contexts moves the concept of safe and comfortable streets for all road users from an abstract goal to imaginable reality. This is an important step in gaining support for the policy and design standards that result in the implementation of Complete Streets.

The use of visual designs, showing a street before and after a proposed re-design, is one of the most effective ways of communicating the benefits and potential of proposed changes. For example, *Places to Grow: The Growth Plan for the Greater Golden Horseshoe*[1] uses renderings to demonstrate the impacts of intensification of land use and density.

Street design manuals are often created to be accessible to both the public and professionals. However, there is no current document for Toronto. Toronto's *Streetscape Manual,*[2] while an excellent resource, applies only to sidewalks. Therefore, *Complete Streets by Design* is an important resource to support both professionals and citizens working to improve cycling and walking conditions.

The goal of redesigning these major street types is to generate conversation about Complete Streets in Toronto. Although seemingly immutable, streets can change over time, sometimes quickly. Often referred to as the bones of the city, streets provide an underlying framework but there is ample flexibility within that structure. Cities are incremental and iterative by nature. Learning and change is part of this process. For now, case studies and design guidelines developed elsewhere have been applied. As Toronto gains experience with streets that better accommodate all modes, local examples will guide further work.

TCAT hopes that these examples will be helpful for imagining what your city can become, and helpful in explaining the benefits of these changes to your neighbours, City Staff and your local Councillor. It is important to remember that changing Toronto's streets will take place in small steps, one street at a time, over the next decade or two. Every street matters, and it will be important for citizens to get involved.

The Esplanade, Toronto, ON *(Copyright Queen's Printer for Ontario, photo source: Ontario Growth Secretariat, Ministry of Infrastructure)*

COMPLETE STREETS

WHY COMPLETE STREETS?

Streets do more for a city than get people from place to place. When functioning well, mobility is easy, comfortable, and safe. When infrastructure does not adequately support a community or restricts mobility, significant problems arise. Traffic, safety, and health have been identified as key issues by the Toronto Community Foundation's annual *Vital Signs Report*.[3] The prosperity of our economy, the health of our environment, and the productivity of our citizens rely on a strong transportation system.

Transportation Capacity Motor vehicle traffic volume exceeds road and public transit infrastructure capacity. In 2006, the economic cost of Toronto's congestion was estimated to be $3.3 billion to commuters and $2.7 billion to lost opportunities.[4]

Safety of the Road Network One in two adult Torontonians bike for work, school or recreation;[5] however, safety, accessibility, and convenience remain key challenges. Toronto currently has the highest pedestrian and cyclist collision rates in Canada.[6]

Transportation + Social Equity Many of those who walk or bike in Toronto are located in lower income neighbourhoods where conditions are unsafe and there are few transportation options.[7] Opting to bike or walk instead of driving to work can save between $5,700-$8,700 a year,[8] freeing up transportation costs to other spending.

Health + Wellness Obesity levels have increased 20% in Toronto since 2003.[9] Only 9% of boys and 4% of girls meet the Canadian Physical Activity Guidelines but elementary school students who walk to school are twice as likely to meet physical activity levels.[10]

Toronto's congested streets result in economic losses, create air quality issues, and are unsafe for vulnerable road users, including children, pedestrians, and cyclists. This situation can be remedied. Toronto has the foundation for a good transportation system that can build a better future. By making the right design choices today we can accommodate more modes of travel to make getting around Toronto a pleasant experience, contribute to economic, social, and environmental sustainability, and create more vibrant and resilient neighborhoods. The changes will be long lasting, serving to improve street life now and accommodate future population growth.

COMPLETE STREETS DEFINED

Complete Streets provide for all road users – pedestrians, bicyclists, transit users, and motorists of all ages and abilities.

The mission of creating safe and usable streets for all road users is accomplished with a wide range of Complete Streets solutions. There is no "one size fits all" solution or specific design standards that can be universally applied. Surrounding context and local community inform the best solution, resulting in many kinds of Complete Streets. How a street is "completed" is unique based on numerous variables including, but not limited to, surrounding community context, role of the street in the overall network, and the traffic volume for all travel modes.

The implementation of Complete Streets results not only in improved conditions for cyclists, pedestrians, seniors, and children but also supports vibrant, healthy communities. Evidence shows that Complete Streets:

- Provide better and more transportation options
- Improve safety for cyclists and pedestrians
- Reduce traffic congestion
- Reduce greenhouse gas emissions
- Create more walkable, therefore, livable communities[11]
- Stimulate economic growth with increased shopping activity, sales, and property values[12]

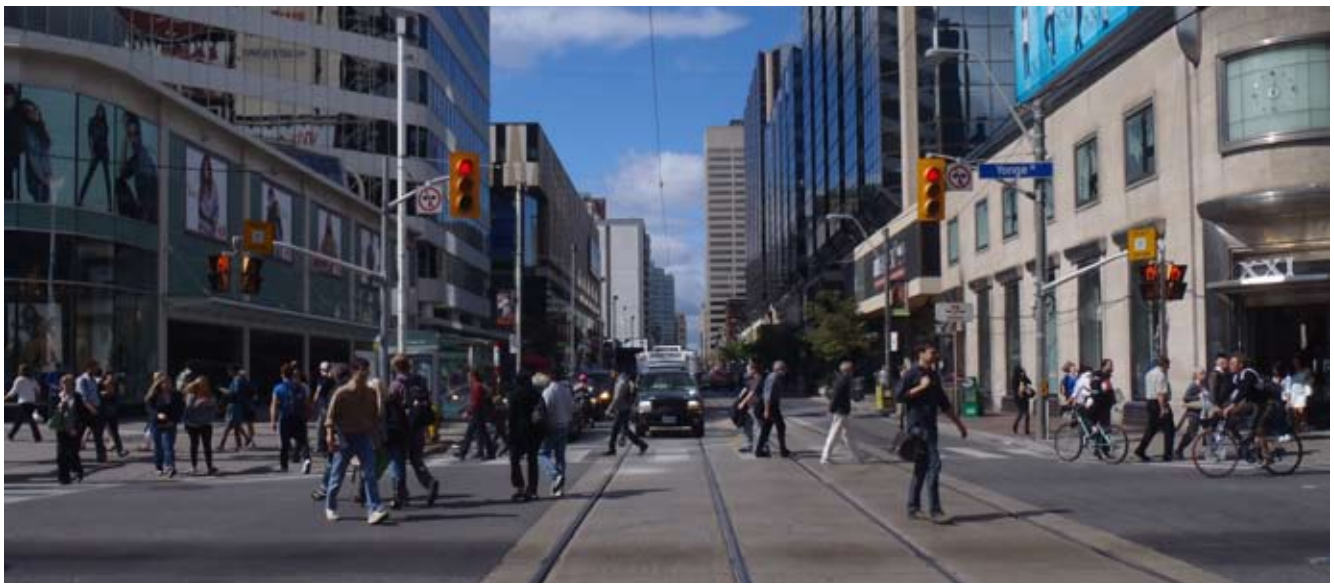
The process to implement Complete Streets is multi-faceted and requires coordination and support. The input of residents and businesses, planners and policy makers, and engineers and designers are needed to incorporate all travel modes in the design and decision-making surrounding new and existing roads.[13] Therefore, one of the key elements of creating Complete Streets is community engagement to ensure the investment brings about desired change and has maximum impact on community development.

Building Complete Streets presents challenges, and success will rely on communities getting involved to develop and support creative engineering and design choices. Every design has to be unique to reflect local circumstances and find the right balance between all modes of transportation.

TORONTO NEEDS COMPLETE STREETS

TCAT's benchmarking research shows that a virtuous cycle that emerges when cities build Complete Streets. Complete Streets elements such as dedicated bicycle lanes or connections to transit, are associated with more cyclists and pedestrians and improve the viability of transit.[14] Increasing numbers of pedestrians and cyclists are associated with reductions in injuries and fatalities.[15] As the number of cyclists and pedestrians in Toronto grows, the City finds itself at an important crossroads. Complete Streets can drastically change and improve Toronto's streets, mobility, and public realm for decades to come.

Making this vision for Toronto a reality involves increasing transportation choices to make Complete Streets. Streets are already designed for cars and trucks, and they will remain a pillar of the transportation system. A second pillar will be improved transit, and a third pillar will be streets designed to encourage walking and cycling. Using all three pillars will result in Complete Streets designed to improve mobility for all ages and all modes of travel.



Busy downtown intersection at Yonge + Dundas St and multi-modal travel options on St. George St., Toronto, ON *(Credit: Carrie Armstrong)*

STREET SELECTION PROCESS

In the first phase of this project, the team developed criteria for selecting street type categories and identified several streets as potential candidates for redesigns. The goal was to produce a variety of practical and affordable design solutions for residential and arterial streets in urban and suburban contexts to illustrate how Toronto could look like with Complete Streets.

Five street types were established with varying traffic volumes and locations:

Urban arterial, urban residential, suburban arterial, suburban residential, and highway crossing.

Traffic Volume + Location	Urban	Suburban	Highway
Residential			
Arterial			
Intersection			

For each of the five street types the following criteria were used to compare candidate streets. A street that:

- Can be generalized to other contexts
- Has transit connections (GO train or bus, TTC subway, streetcar, bus)
- Has connections to the existing bike network
- Has connections to schools and parks
- Links multiple neighborhoods (arterials)
- Is identified in the current City of Toronto Bike Plan[16]
- Is considered a priority and/or feasible by City staff
- Was considered in the 2010 “Think Bike” workshops of local and Dutch bicycle professionals[17]
- Was one of the Top 100 dangerous intersections for pedestrians[18]
- Is approved in the Capital Works project schedule for major reconstruction

Up to ten candidate streets were analyzed using the above criteria for each street type (35 in total). In July 2011, the project team circulated the list of candidate streets and background research to various stakeholders for feedback (including City of Toronto staff, 8-80 Cities, Toronto Cyclists Union, and University of Toronto’s Cities Centre). Based on reviews and further analysis, another urban arterial street was added, for a total of six street redesigns. The decision to include two urban arterial streets was due to the different characteristics and function of north-south and east-west arterials.

DESIGN WORK

In the fall of 2011, TCAT shared a first draft of designs for the selected streets with a wide network of professionals, associations, and citizens for review, asking the question: *What Do Complete Streets Look Like to You?* That document showed an illustrated set of proposed cross-sections that demonstrate a reallocation of right-of-way space according to Complete Streets principles. Based on the comments received the design team revised the cross sections and produced diagrammatic site plans, photo-realistic renderings, and context maps of each of site.

PROJECT GOALS, SCOPE + DESIGN APPROACH

Complete Streets demand context sensitive solutions. There is no one-size-fits-all answer and multiple approaches can accomplish the goal of providing a safe and comfortable environment for all streets users. The proposed street re-designs were created with a few guidelines in mind.

Design Scope

- Complete Streets by Design is a visualization exercise to increase awareness of the look and feel of Complete Streets
- Transit routes, network connections, and intersections are beyond the scope of the proposed redesigns
- Streets were "completed" in ways that reflect Toronto's current budgetary, economic, and political climate

Street Selections

- Streets were selected and re-designed to be applicable to dominant Toronto street types
- While being context specific, the goal is to demonstrate designs that are applicable to other Toronto streets
- Some street selections are in the process of being redesigned by the City of Toronto

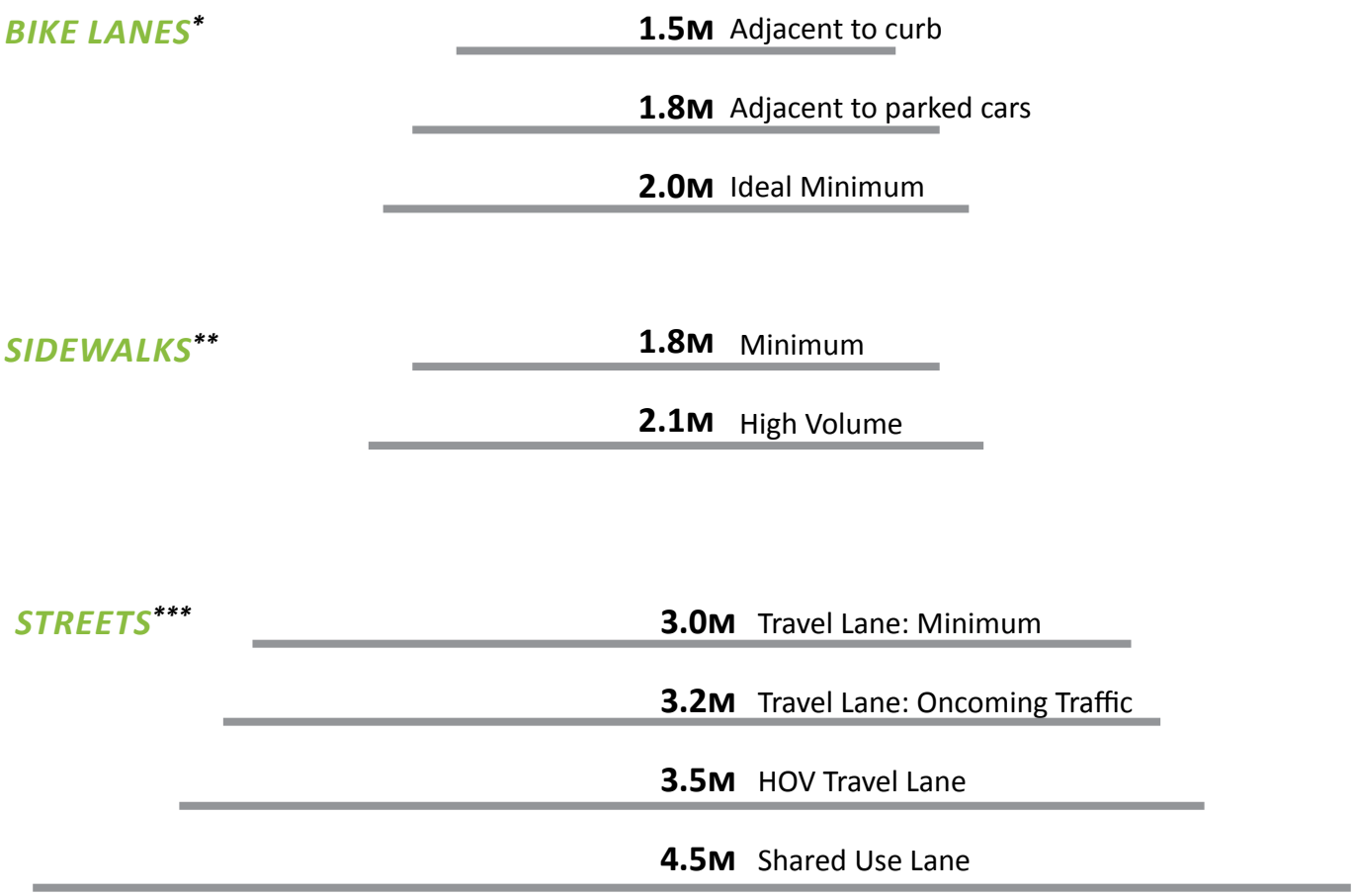
Design Protocol

- Complete Street redesigns maintain existing curbs and roadway dimensions
- Local and established design standards are used whenever possible
- Proposed road dimensions are related to speed and context
- In accordance with the principle of Complete Streets fitting into context, there are deviations from these standards. Deviations from design standards take precedent from existing Toronto streets that work effectively.

Walking + Bike Lane Symbols *(Credits: o5com + Duchamp)*

STREET SECTION BASELINES

One of the most challenging aspects of designing Complete Streets is the balancing act required in finding the space for all of the desired uses. For the purposes of this resource, Toronto's minimum standard widths for conventional bicycle lanes, sidewalks, and traffic lanes have been used. However, new standards are emerging for bicycle lanes[19] and sidewalk widths[20] that provide more space between motor vehicles, cyclists, and pedestrians to increase the safety and comfort of vulnerable road users.



*City of Toronto Cycling. (2004, February). *DRAFT Bicycle Lane Design Guidelines.* Retrieved from www.toronto.ca/cycling/thinkbike/pdf/bike_lane_design_guidelines.pdf.

**City of Toronto City Planning, Clean + Beautiful City Secretariat and Transportation Services. (September, 2006). *Vibrant Streets: Toronto's Coordinated Street Furniture Program Design and Policy Guidelines.* (Updated 2010).

***Transportation Association of Canada. (1999, September). *Geometric Design Guidelines.*

SITE LOCATIONS

01	***Urban Arterial (E-W)***	Danforth Avenue + Logan Avenue
02	***Urban Arterial (N-S)***	Yonge Street + Shuter Street
03	***Suburban Arterial (E-W)***	Eglinton Avenue East + Commonwealth Avenue
04	***Highway Crossing***	Jane Street + Highway 401
05	***Urban Residential***	Logan Avenue + Withrow Avenue
06	***Suburban Residential***	Seneca Hill Drive

01 DANFORTH AVE + LOGAN AVE

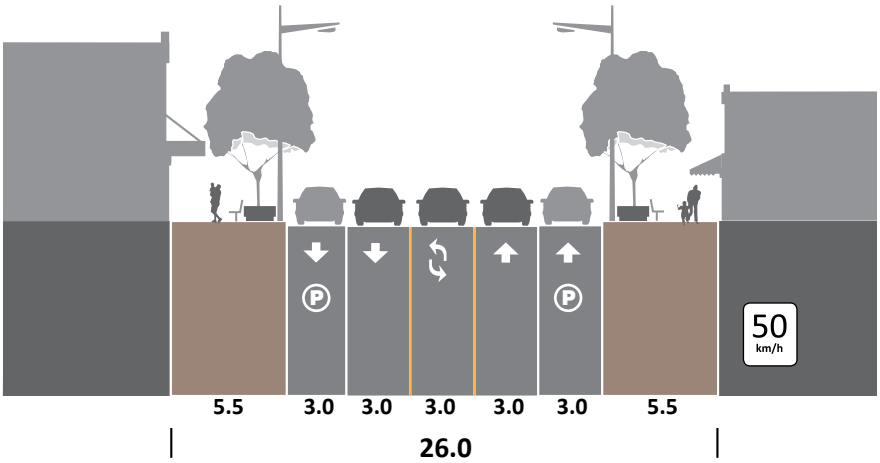
26M ROADWAY *A major urban east-west arterial street along a subway line with vibrant sidewalk activity, including many shops and restaurants, and nearby connections to the existing bikeway network*

Since pedestrian and cyclist collisions occur more often on arterial roads,[21, 22] it was essential to tackle a typical Toronto major arterial with public transit assess and shared lanes for cars, bicycles, and on-street parking. This section of the Danforth was selected because it is heavily traveled by pedestrians, cyclists, transit users, and motor vehicles. The parking/rush hour traffic lane creates conflicts for cyclists that use this street to access retail services or the nearby bikeway network.

The proposed Complete Streets redesign reallocates the narrow turn lane that runs the length of the street to bike lanes. This shift allows cyclists to move along safely on this frequently congested arterial while providing minimal impact on motor vehicle traffic flow.

Context Map

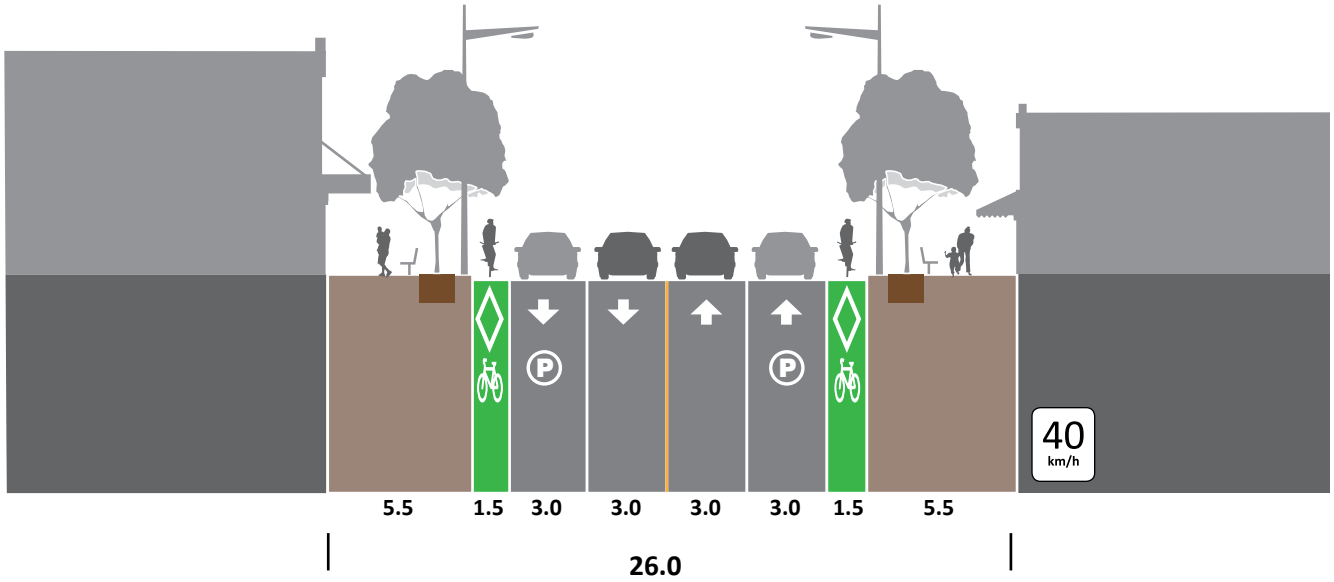
Existing Street Section



Existing Street

COMPLETE STREET

Complete Street Section



Complete Street

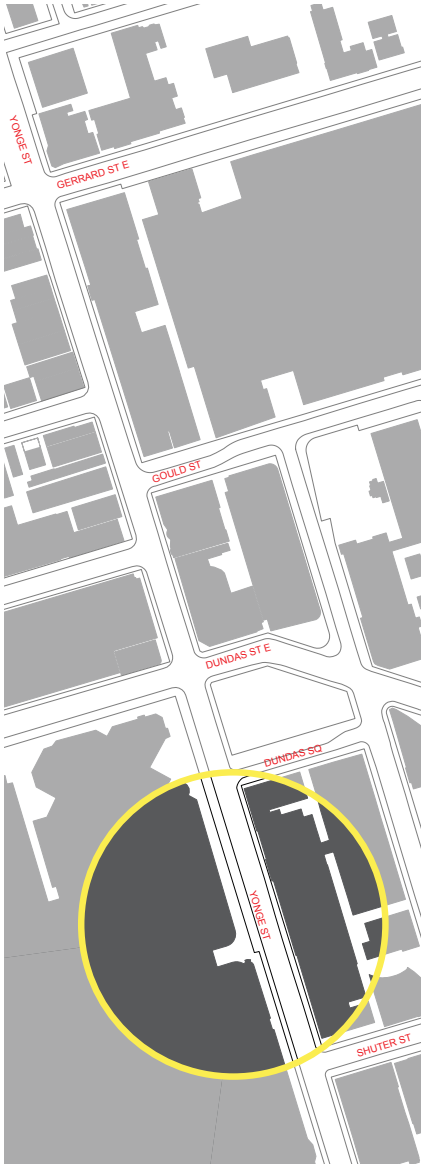
02 YONGE ST + SHUTER ST

26M ROADWAY *A major urban north-south arterial street above a subway line with abundant pedestrian activity, including many shops and restaurants, and nearby connections to the existing bikeway network*

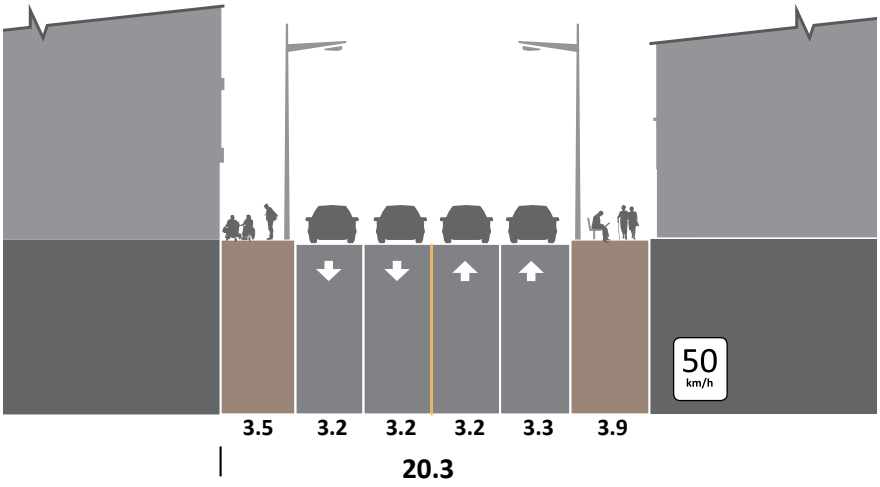
This downtown arterial street in Toronto's shopping core is congested for every travel mode. Narrow sidewalks overflow with pedestrians and cars and cyclists vie for limited road space.

The priorities for the Complete Street approach in this location are an expanded sidewalk for pedestrians, dedicated space for cyclists, and a flexible design that doubles as event space. The cobbled surface, rolled curbs, and removable bollards create the sense of a continuous urban plaza. Trees in sidewalk grates and continuous trenches are proposed to add green space, shade, and pedestrian comfort.

Context Map



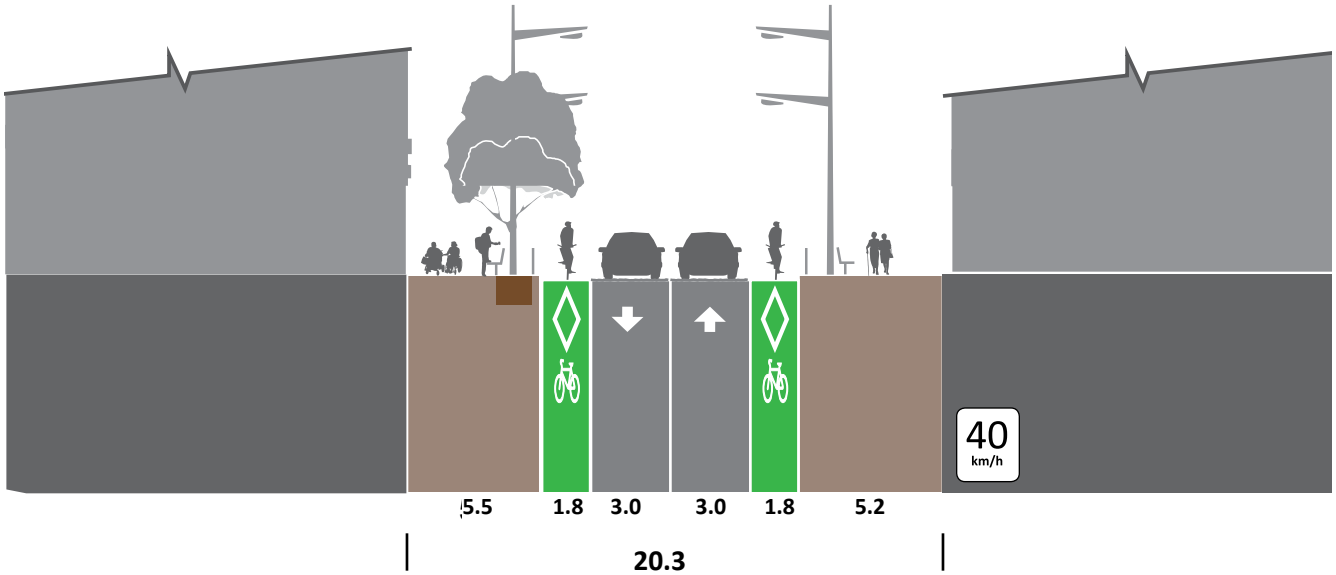
Existing Street Section



Existing Street

COMPLETE STREET

Complete Street Section



Complete Street

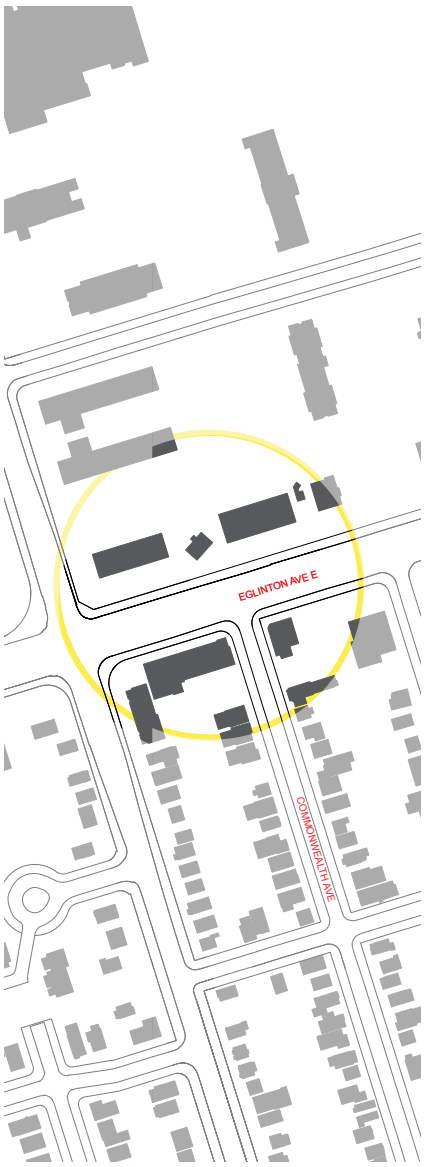
03 EGLINTON AVE EAST + COMMONWEALTH AVE

36M ROADWAY *A fast-moving suburban major arterial street with connections to an apartment tower neighbourhood, suburban strip malls, and to the existing bikeway network. Eglinton Avenue East has four of Toronto's most dangerous intersections for pedestrians.*[23]

A large transit infrastructure project has been approved (estimated to be completed by 2020) for this suburban arterial to be either an underground subway or an at-grade Light Rapid Transit line. This area is at high risk for heat vulnerability due to the combination of surface temperature, distance from green space, lack of tree shading, presence of high-rise buildings, and population density.[24] Therefore, mitigating temperature with street trees is an essential component of this redesign.

The priority for the proposed Complete Streets redesign is to increase comfort for non-vehicular travel modes in the form of dedicated bike lanes and street trees. Narrower lane widths keep traffic at the speed limit while wider outside lines accommodate transit. Planted medians provide refuge for pedestrians during street crossings at intervals between turn lanes.

Context Map

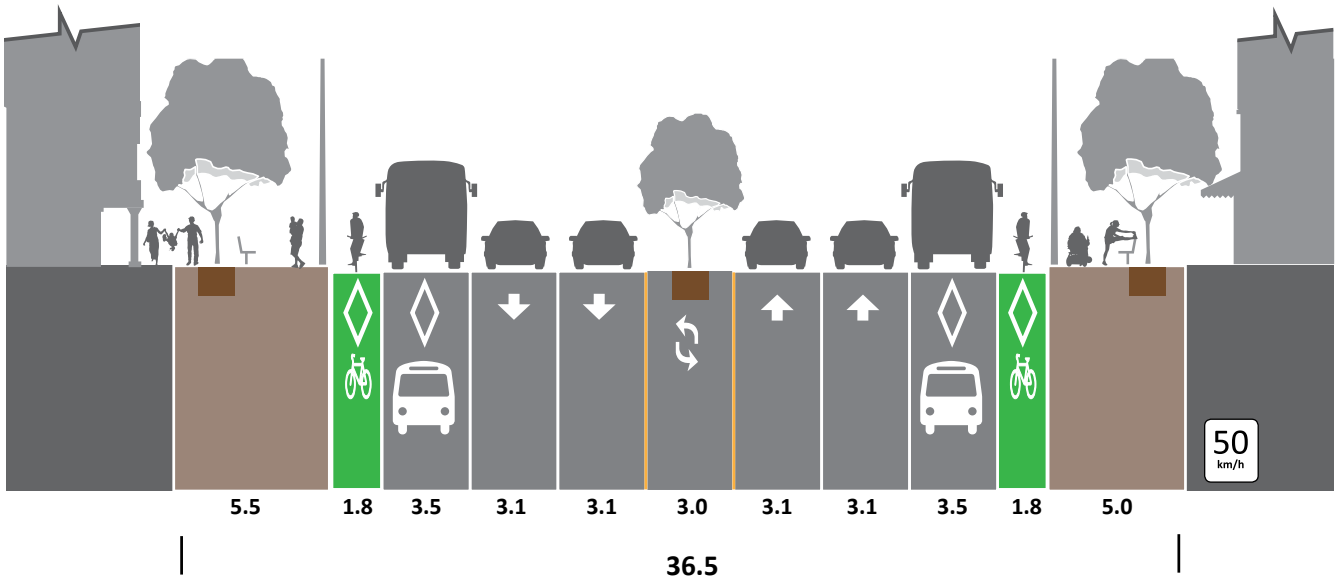


Existing Street Section

Existing Street

COMPLETE STREET

Complete Street Section



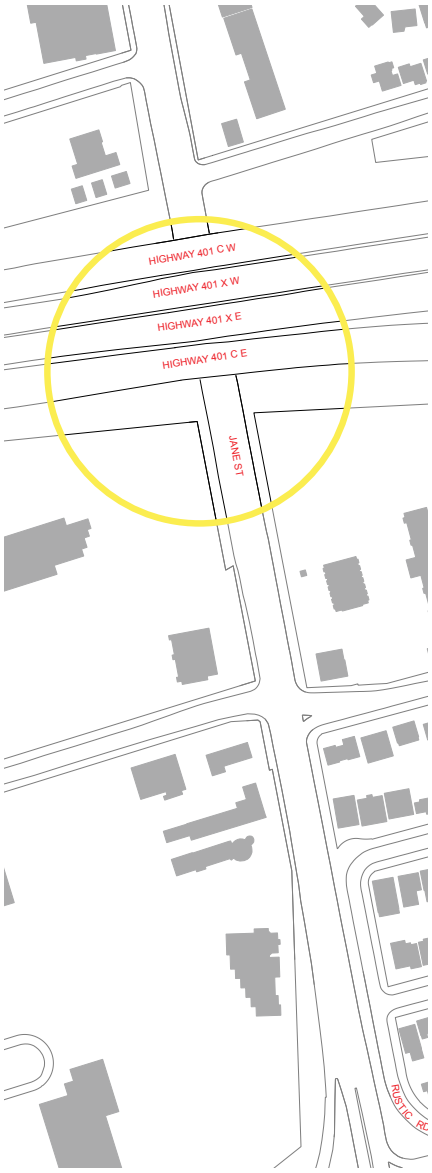
Complete Street

04 JANE ST + HIGHWAY 401

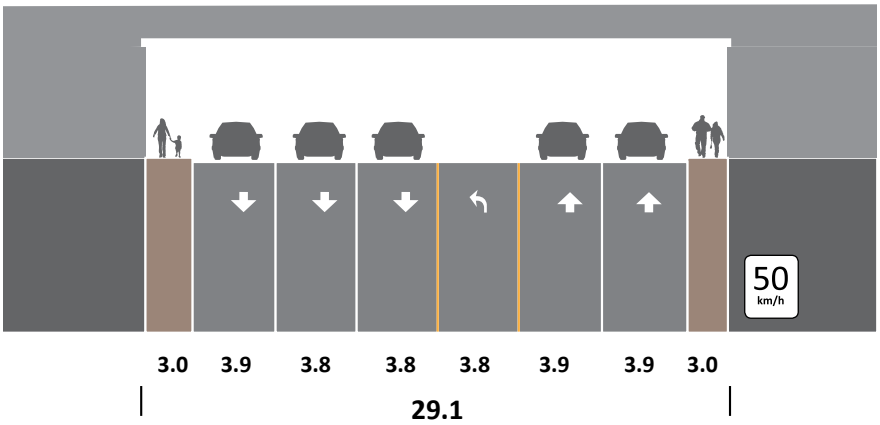
36M ROADWAY *A major arterial street crossing below a highway overpass in a suburban context*

Highway 401 is a barrier between the residential neighbourhoods it runs through. The purpose of the proposed Complete Streets redesign is to create a comfortable environment for all street users at a highway crossing. To protect cyclists, raised bike lanes were added under the bridge, ramping down back to street level on either side. The connecting street design provides bike lanes while maintaining the existing curbs, roadway width, and bridge infrastructure. The green paint provides added definition to the bike lane, alerting motorists to its presence.

Context Map



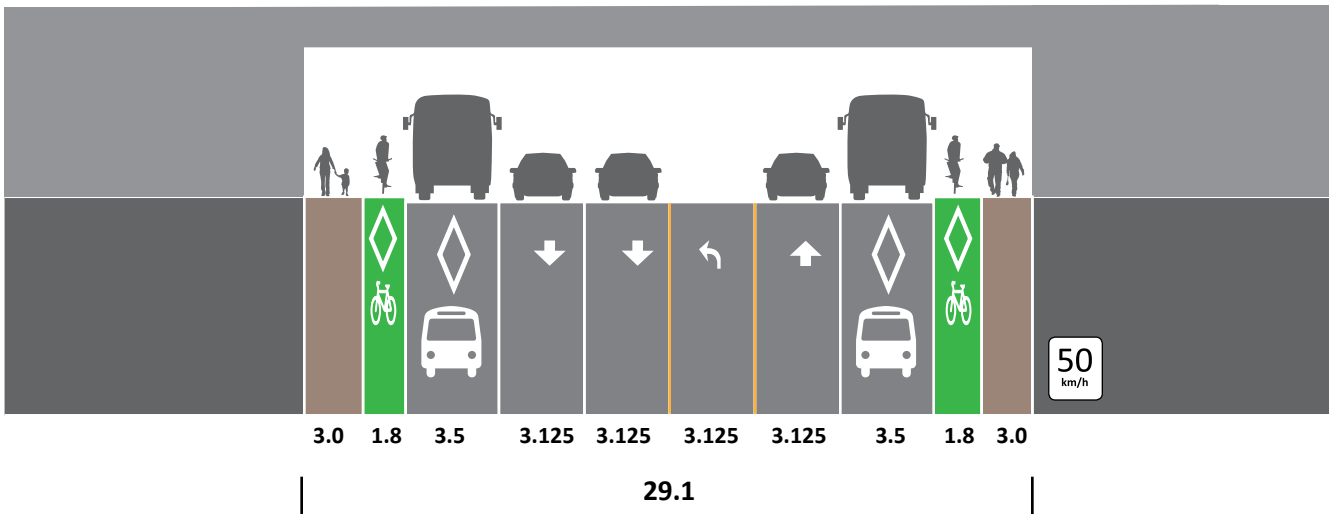
Existing Street Section



Existing Street

COMPLETE STREET

Complete Street Section



Complete Street

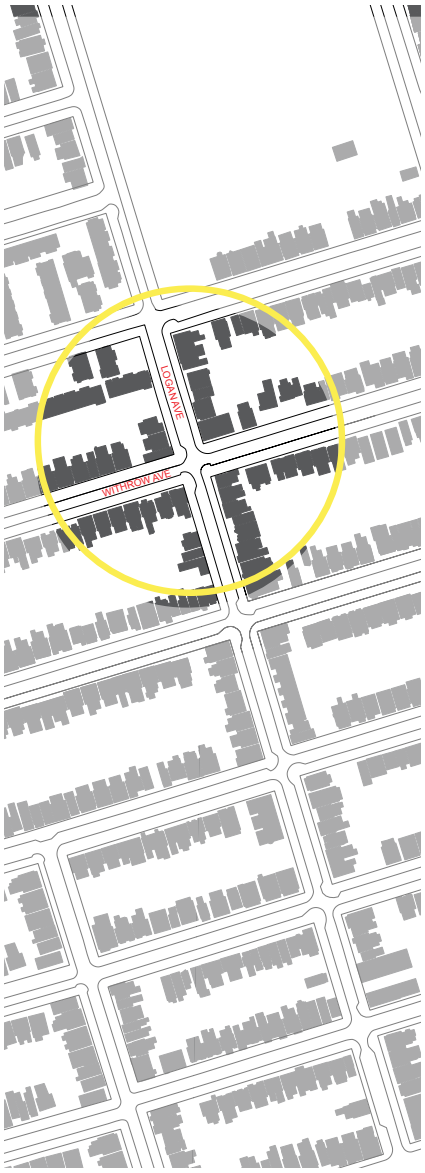
05 LOGAN AVE + WITHROW AVE

18M Roadway *A local street in an urban residential context with traffic calming adjacent to a park*

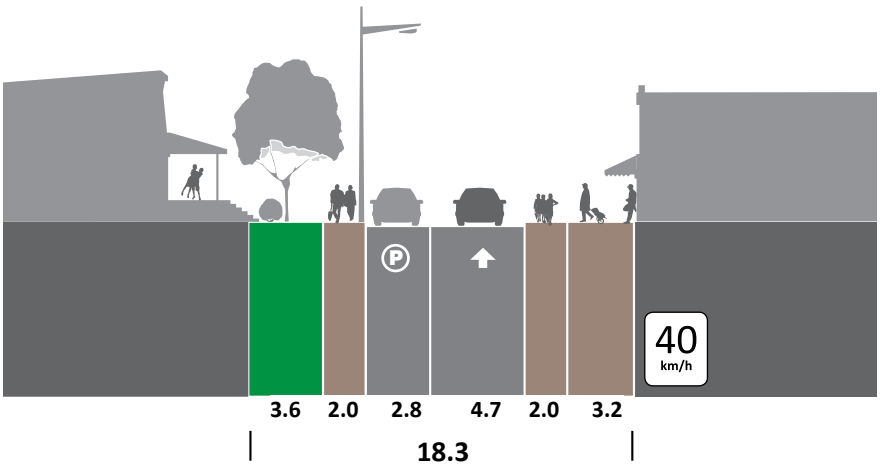
This local street in a residential neighborhood near downtown that leads to a park represents a nearly Complete Street. It is slow moving, traffic calmed, and an informal bike route. To take the concept further, the woonerf, or living street, design is proposed. There is no physical separation of the road space, relying on human interaction to negotiate usage. Walking, biking, and play coexist with parked and driving cars.

This approach to this residential Complete Street is a living street, with space for front yards to extend into the sidewalk with plantings and benches. The street continues to provide a comfortable walking environment, safe cycling route, and on-street parking. With the additional space for recreation, the street becomes an extension of and gateway to the nearby park.

Context Map



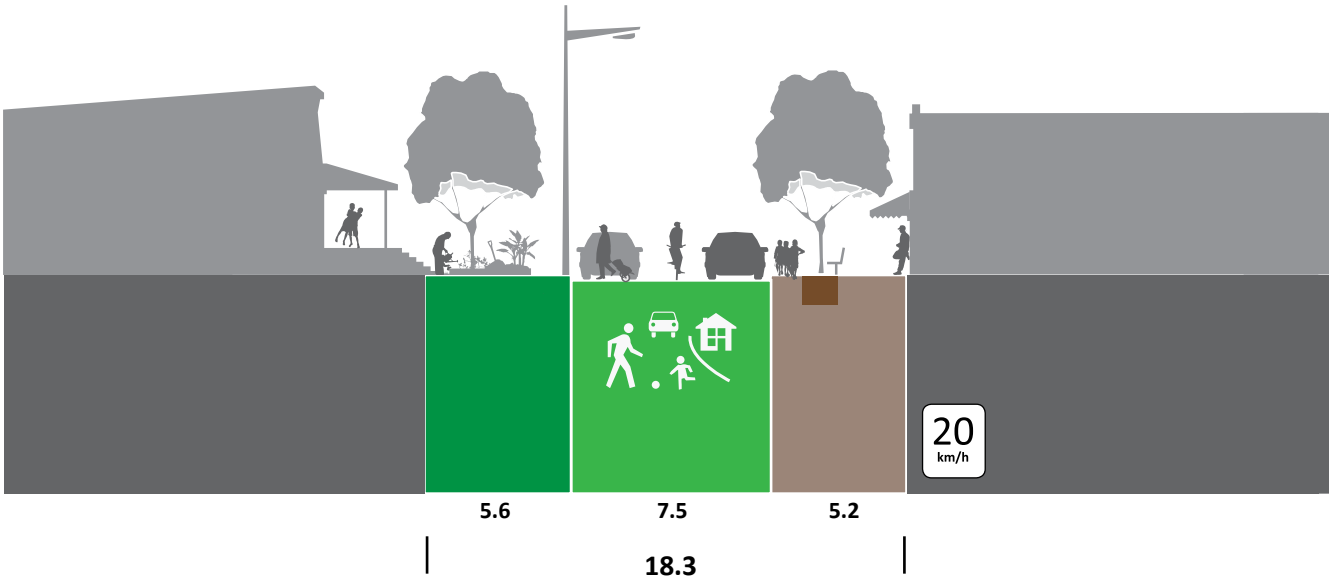
Existing Street Section



Existing Street

COMPLETE STREET

Complete Street Section



Complete Street

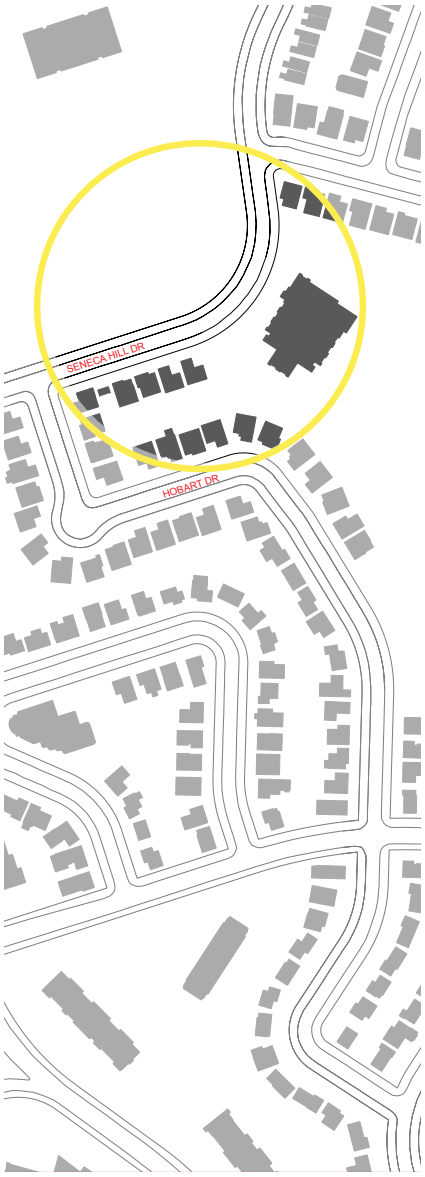
06 SENECA HILL DRIVE

20M ROADWAY *A suburban residential street adjacent to an elementary school that serves as a collector*

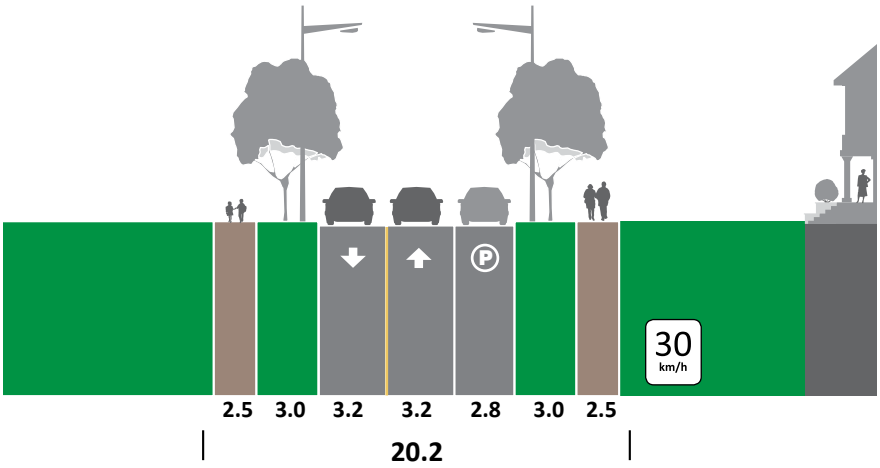
Located in a suburban context adjacent to an elementary school, this street functions as a collector and provides on-street parking. The broad sight lines of this wide street encourage drivers to speed, although the presence of parked cars narrow the road and slow traffic. The goal of the proposed redesign is to create a street environment that supports active transportation and ensures the safety of students and neighborhood residents.

The Complete Streets approach calms traffic with curb extensions that shorten the distance pedestrians need to travel to cross the street and visually narrow the road. On-street parking is retained between bulbouts. Sharrows are located in the middle of the lane to encourage confident cyclists to take the lane and remind motorists that the road is shared with cyclists. While children with bicycle tires under 61cm may legally ride on the sidewalk,[25] this redesign facilitates youth cycling.

Context Map



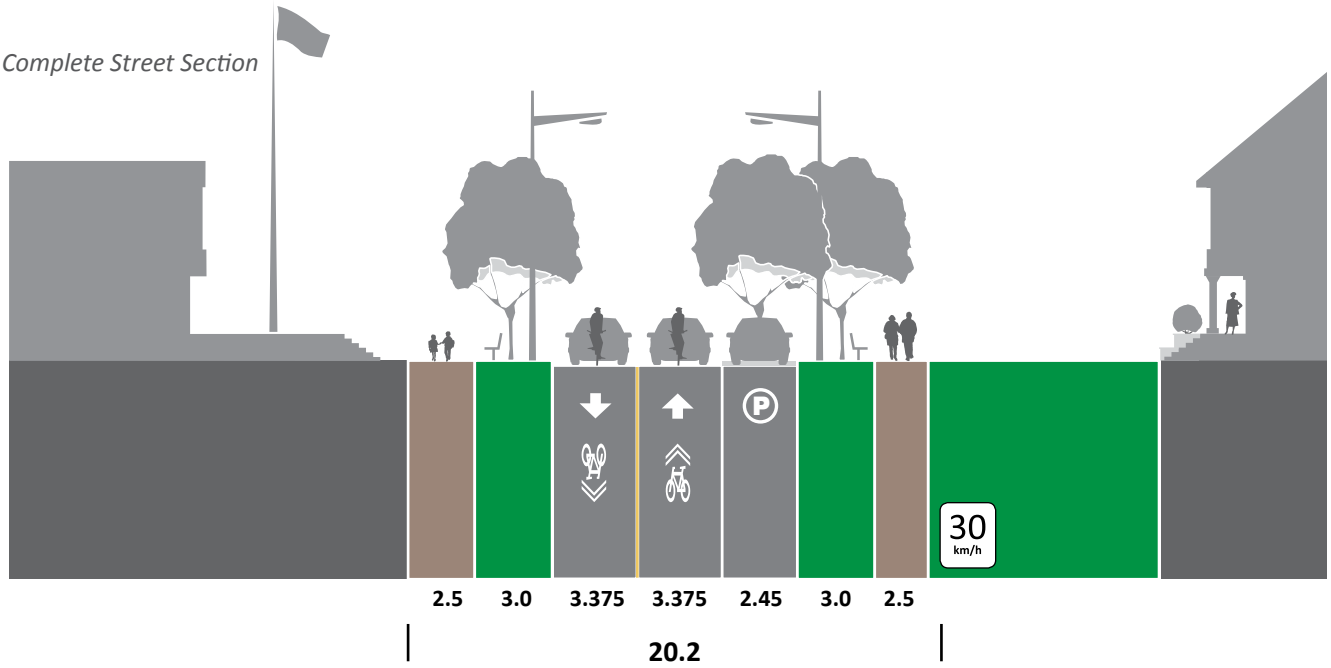
Existing Street Section



Existing Street

COMPLETE STREET

Complete Street Section



Complete Street

GET INVOLVED

1. ***Stay informed***

   Sign up for TCAT News , the City of Toronto's Pedometer, and Cyclometer.
   www.tcat.ca/newsletter
   www.toronto.ca/transportation/pedometer
   www.toronto.ca/cycling/cyclometer/index.htm

2. ***Speak up***

   Attend public meetings for street redesigns, bike lanes, transit, etc. Get in touch with your Councillor and let them know you want to see Complete Streets in your neighborhood and Toronto. Contact the City of Toronto Civic Engagement office to find out more.
   www.toronto.ca/civic-engagement/index.htm

3. ***Be active***

   Get out there on your feet and bike. The more pedestrians and cyclist we out there, the more road space that will be allocated to it.

4. ***In your neighborhood and ward***

   Get involved with your local neighbourhood or business improvement association, attend a Jane's walk in your area or join a Toronto Cyclists Union ward group.
   www.janeswalk.net
   www.bikeunion.to/wards

5. ***Complete Streets Canada movement***

   Attend TCAT's annual Complete Streets Forum and join the Complete Streets Canada movement.
   www.tcat.ca/events
   www.completestreets.ca

St. George Street, Toronto, ON *(Credit: Elana Horowitz)*

GLOSSARY

Active Transportation Any form of human-powered transportation – walking, cycling, using a wheelchair, in-line skating or skateboarding.

Public Health Agency of Canada. (2012, February 9). Physical Activity: What is Active Transportation? Retrieved from http://www.phac-aspc.gc.ca/hpps/hl-mvs/pa-ap/at-ta-eng.php

Collector Every street in the City of Toronto is classified within a hierarchy that designates that some roads should carry higher traffic volumes and speeds than others. A collector road is the second lowest on this hierarchy and is currently designated to carry traffic volumes of 2,500 to 8,000 vehicles and less than 1,500 bus (or streetcar) passengers per day. They are characterized by sidewalks on both sides of the road and signalized intersections at arterial roads. Collectors are a medium priority for winter maintenance.

City of Toronto. (n.d.) *Road Classification System.* Retrieved from http://www.toronto.ca/transportation/road_class/index.htm.

Curb Extension An extension of the curb into the street, reallocating a portion of street space to pedestrians or ancillary uses. Curb extensions are one of the most effective traffic calming tools. Also known as bulbouts, popouts, or neckdowns, curb extensions increase drivers' awareness of pedestrians, decrease crossing distance, reduce pedestrian exposure to traffic, and reduce traffic speeds.

StreetsWiki. (n.d.) *Curb Extension.* Retrieved from http://streetswiki.wikispaces.com/Curb+Extensions.

Local Road Every street in the City of Toronto is classified within a hierarchy that designates that some roads should carry higher traffic volumes and speeds than others. A local road is the lowest on this hierarchy and is currently designated to carry traffic volumes of less than 2,500 vehicles/day. These roads are characterized by low traffic speeds, sidewalks on at least one side of the road, no bus routes, and are a lower priority for winter maintenance.

City of Toronto. (n.d.) *Road Classification System.* Retrieved from http://www.toronto.ca/transportation/road_class/index.htm.

Major Arterial Every street in the City of Toronto is classified within a hierarchy that designates that some roads should carry higher traffic volumes and speeds than others. A major arterial is the second highest on this hierarchy and is currently designated to carry traffic volumes greater than 20,000 vehicles and 5,000 bus passengers per day. The street features speed limits of 50 to 60 km/hr, is subject to access controls, and is a high priority for winter maintenance.

City of Toronto. (n.d.) *Road Classification System.* Retrieved from http://www.toronto.ca/transportation/road_class/index.htm.

Minor Arterial Every street in the City of Toronto is classified within a hierarchy that designates that some roads should carry higher traffic volumes and speeds than others. A minor arterial is in the middle on this hierarchy and is currently designated to carry traffic volumes from 8,000 to 20,000 vehicles and 1,500 to 5,000 bus passenger per day. Speed limits are 40 to 60 km/hr and there are no “Stop” signs, with main intersections controlled by traffic signals. Winter maintenance is a high priority. Minor arterials have sidewalks on both sides and may have bicycle lanes.

City of Toronto. (n.d.) *Road Classification System.* Retrieved from http://www.toronto.ca/transportation/road_class/index.htm.

Shared Space Street without physical or signed traffic demarcation. Removing the traditional segregation of motor vehicles, pedestrians and other road users improves road safety and traffic flow by encouraging negotiation of shared areas at appropriate speeds and with due consideration for the other users.

StreetsWiki. (n.d.) *Shared Space*. Retrieved from http://streetswiki.wikispaces.com/Shared+Space.

Sharrow Short for “shared lane pavement marking,” consisting of a bicycle symbol and two white chevrons, to indicate where cyclists should ride in a travel lane for safety reasons: Where cyclists should ride one metre from the curb to avoid debris and sewer grates; in lanes that are too narrow for cyclists and motorists to travel side-by-side, cyclists should ride in the centre of the lane to discourage motorists from passing too closely; and where there is on-street parking, cyclists should ride one metre from parked cars to avoid the “door zone”.

City of Toronto Cycling. (n.d.) "Shared Lane Pavement Markings (“Sharrows”)." Retrieved from www.toronto.ca/cycling/network/pdf/sharrow_faq.pdf.

Woonerf An area, usually residential, where motorists and other users share the street without boundaries such as lanes and curbs. The Dutch term can be translated as "residential yard." The street functions as a public living room, where adults gather and children play safely because vehicle speed is kept to a minimum.

StreetsWiki. (n.d.) *Woonerf.* Retrieved from http://streetswiki.wikispaces.com/Woonerf.

REFERENCES

1. Ontario Ministry of Infrastructure. Ontario Growth Secretariat. (2006, June 16). P*laces to Grow: Growth Plan for the Greater Golden Horseshoe*. Retrieved from https://www.placestogrow.ca/images/pdfs/FINAL-GUIDE-ENG.pdf.
2. City of Toronto Planning Department. (2010). *Streetscape Manual.* Retrieved from http://www.toronto.ca/planning/urbdesign/streetscapemanual.htm.
3. Toronto Community Foundation. (2010). *Toronto's Vital Signs*. Retrieved from www.tcf.ca/vitalinitiatives/Torontos_Vital_Signs_2010_Metro.pdf.
4. Greater Toronto Transportation Authority, Metrolinx. (2008). *Costs of Road Congestion in the Greater Toronto and Hamilton Area: Impact and Cost Benefit Analysis of the Metrolinx Draft Regional Transportation Plan*. Retrieved from http://www.metrolinx.com/en/regionalplanning/costsofcongestion/ISP_08-015_Cost_of_Congestion_report_1128081.pdf
5. Toronto Community Foundation. (2010). *Toronto's Vital Signs 2010 Highlights*. Retrieved from http://www.tcf.ca/vitalinitiatives/Torontos_Vital_Signs_2010_Metro.pdf.
6. City of Toronto: Transportation Services. (2011). *Traffic Safety Unit.* Retrieved from http://www.toronto.ca/transportation/publications/brochures/2010_ped.pdf and http://www.toronto.ca/transportation/publications/brochures/2010_bike.pdf
7. Hess, Paul M. + Farrow, Jane. (2011). *Walkability in Toronto's High-rise Neighbourhoods*. Retrieved from http://janeswalk.net/assets/uploads_docs/Walkability_Full_Report.pdf.
8. City of Toronto Cycling. (n.d.) *Economic benefits of integrating cycling.* Retrieved from http://www.toronto.ca/cycling/bfba/economic_benefits.htm on March 12, 2012.
9. In NVS, Table III-3: Obesity Rates of the Population 18 and Over by CMA and Health Regions, 2003, 2005 and 2007-2010 as cited in Toronto Community Foundation. (2010). *Toronto's Vital Signs*. Retrieved from www.tcf.ca/vitalinitiatives/Torontos_Vital_Signs_2010_Metro.pdf.
10. Active Health Kids. (2011). *Active Health Kids Canada Report Card.* Retrieved from http://dvqdas9jty7g6.cloudfront.net/reportcard2011/ahkcreportcard20110429final.pdf as cited in Toronto Community Foundation. (2010). *Toronto's Vital Signs.* Retrieved from www.tcf.ca/vitalinitiatives/Torontos_Vital_Signs_2010_Metro.pdf.
11. National Complete Streets Coalition (n.d.) *Complete Streets Fundamentals*." Retrieved from www.completestreets.org/complete-streets-fundamentals/factsheets on February 20, 2012.
12. National Complete Streets Coalition. (n.d.) *Complete Streets Factsheets*. Retrieved from www.completestreets.org/webdocs/factsheets/cs-revitalize.pdf on February 20, 2012.
13. National Complete Streets Coalition. (n.d.) *Complete Streets Factsheets.* Retrieved from www.completestreets.org/webdocs/factsheets/cs-revitalize.pdf.
14. Toronto Centre for Active Transportation. (2010). Benchmarking Active Transportation in Canadian Cities. Retrieved from http://tcat.ca/sites/all/files/TCAT_ATBenchmarkingReport.pdf.
15. Toronto Centre for Active Transportation. (2010). Building Better Cycling Arteries in Cities: Lessons for Toronto. Retrieved from http://tcat.ca/sites/all/files/TCAT_CyclingArteriesReport_0.pdf.
16. City of Toronto Cycling. (2001, June). *City of Toronto Bike Plan: Shifting Gears.* Retrieved from http://www.toronto.ca/cycling/bikeplan/pdf/bike_plan_full.pdf.
17. City of Toronto Cycling. (2010). *Think Bike Workshops.* Retrieved from http://www.toronto.ca/cycling/thinkbike/index.htm.
18. Cain, Patrick. (2011, June 07). *Toronto's most dangerous intersections for pedestrians.* Global News. Retrieved from http://www.globalnews.ca/dangerous+pedestrian+intersections+Toronto+map/4907913/index.html.
19. National Association of City Transportation Officials. (n.d.) *Conventional Bike Lanes*. Retrieved from http://nacto.org/cities-for-cycling/design-guide/bike-lanes/conventional-bike-lanes.
20. Ontario Ministry of Community and Social Services. (2012, February 29). *Accessibility Standard for the Built Environment*. Retreived from http://www.mcss.gov.on.ca/en/mcss/programs/accessibility/other_standards/builtenvironment/index.aspx.
21. City of Toronto Transportation Services. (2003). *City of Toronto Bicycle/Motor-Vehicle Collision Study*. Retrieved from http://www.toronto.ca/transportation/publications/bicycle_motor-vehicle/index.htm.
22. City of Toronto Transportation Services (2007). *City of Toronto Pedestrian Collision Study.* Retrieved from http://www.toronto.ca/transportation/walking/pdf/ped_collision_study-full_report.pdf.
23. Cain, Patrick. (2011, June 07). *Toronto's most dangerous intersections for pedestrians.* Global News. Retrieved from http://www.globalnews.ca/dangerous+pedestrian+intersections+Toronto+map/4907913/index.html.
24. Gower, Stephanie; Mee, Carol; and Campbell, Monica. (2011, July). *Protecting Vulnerable People from Health Impacts of Extreme Heat.* Toronto Public Health. Retrieved from http://www.toronto.ca/health/hphe/air_quality/pdf/protecting_ppl_in_extreme_heat.pdf.
25. City of Toronto Cycling. (n.d.) *Sidewalks are for Pedestrians*. Retrieved from http://www.toronto.ca/cycling/safety/sidewalk/sidewalk.htm on March 15, 2012.

APPENDIX: STREET SELECTION CANDIDATES

DOWNTOWN ARTERIAL	DOWNTOWN RESIDENTIAL	SUBURBAN ARTERIAL	SUBURBAN RESIDENTIAL	HIGHWAY CROSSINGS
University Ave	Sorauren Ave	Eglinton Ave (E+W)	Ruddington Dr	Yonge St + Hwy 401
Bathurst St	Shaw St	Lawrence Ave East	Seneca Hill Dr	Bayview Ave + Hwy 401
Sherbourne St	Logan Ave	Finch Ave (E+W)	South Kingsway	Spadina Ave + Gardiner Expwy
Ossington Ave	Carlaw Ave	Albion Rd	Princess Margaret Blvd	York St + Gardiner Expressway
Spadina Ave	Pape Ave	Kingston Rd		Jane St + Hwy 401
Yonge St		Markham Rd		
Richmond St				
Queen St East				
Bloor St				
Danforth Ave				

Financial support provided by the Vital Toronto Fund at the Toronto Community Foundation

TORONTO COMMUNITY FOUNDATION

The Art of Wise Giving™

Visit ***www.tcat.ca*** or ***www.completestreets.ca*** for more information.

Complete Streets

tcat toronto centre for active transportation

Clean Air Partnership