

*Turning a Conventional Suburban Arterial Widening into a Complete Streets Showcase*  
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## ABSTRACT

The Gore Road is an apparently conventional suburban four-lane arterial serving recently-developed residential communities in the east part of Brampton, Ontario. Anticipating significant additional urbanization in and around the study area, the Region of Peel initiated the planning process to widen a four-kilometre segment of the road to six lanes, per its Long Range Transportation Master Plan. However, corridor-specific traffic modelling confirmed that widening would simply add more traffic to key intersections that are already operating at capacity.

The Region and its study team seized the opportunity to not only retain The Gore Road at four lanes but to transform it into a corridor for all the community by applying Complete Streets principles to its redesign. The specific tools applied to The Gore Road include reconfiguration of its major traffic intersection to be more functional and safer, transit priority through queue jump lanes and bus bays, reduced speed limit and lane widths to help slow traffic, tighter intersection layouts to benefit pedestrians and cyclists, new in-boulevard cycle tracks, a unique segment of multi-use trail and eco-learning zone which avoids bridge and stream impacts, and Low Impact Design for in-corridor stormwater management.

An active community and stakeholder engagement strategy built awareness and support for the project. This Showcase Project will in turn inform the planning and management of other major road corridors across the Region.

## Background

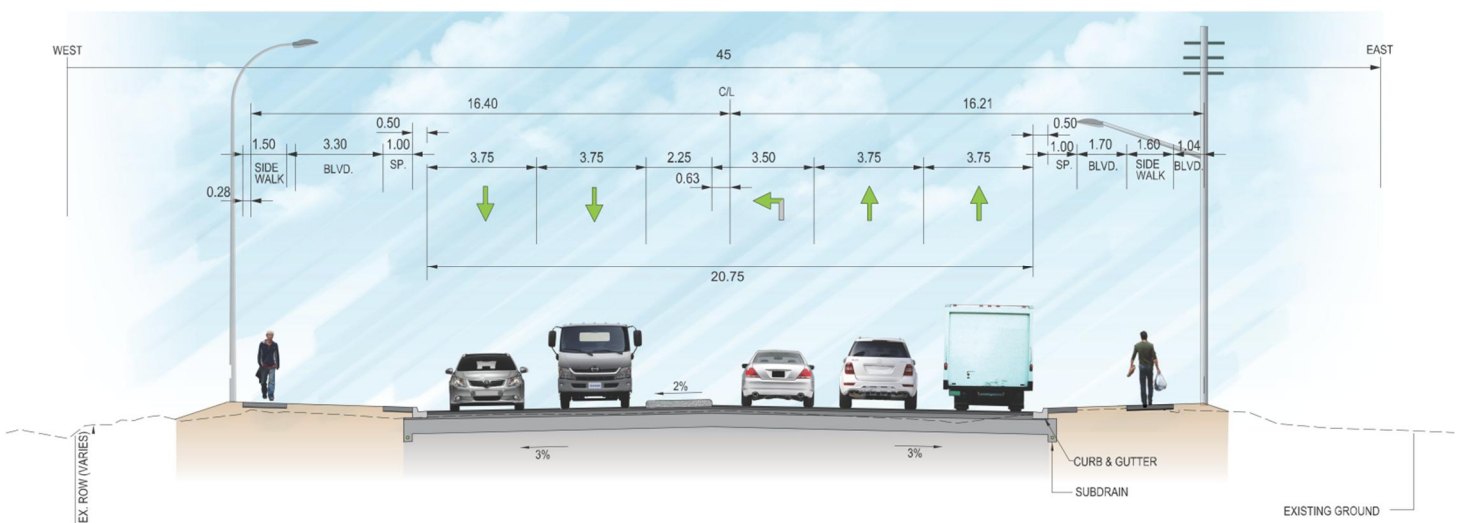
The Gore Road is a suburban arterial in the eastern part of Brampton, Ontario. It is under the jurisdiction of the Regional Municipality of Peel. The Gore Road extends 33 km from Queen Street north to Highway 9; the southern 4 km is urbanized while the remainder passes through largely rural surroundings.

Development in the urban part of The Gore Road corridor is largely residential, interspersed with commercial plazas, schools, and open space. Development has occurred largely since 1990 on what was formerly farmland; residential areas consist of uniform subdivisions of single-family homes, with a few town home pockets. None of the new residential areas have direct access from The Gore Road. There are two large secondary schools and a public school in the corridor; the latter is an older facility that has direct access from The Gore Road. The topography is relatively level, drained by a minor tributary of the Humber River that winds through the area; The Gore Road, on its straight alignment, crosses the stream three times within a short distance.



In the study area – the 4 km long southernmost segment between Queen Street and Castlemore Road – the Gore Road is the only continuous north-south route serving the area. Like many Regional roads, The Gore Road must accommodate longer-distance “network” traffic as well as locally-generated vehicular trips, while respecting the needs of those who walk or cycle in the corridor. To serve the growing demand in the area, The Gore Road was widened from its original two-lane rural configuration to a four-lane urban roadway (with near-continuous centre turn lanes) in 2011-12. Sidewalks and plantings have been provided on both sides of the road. In other words, as illustrated in Photo 1 and Figure 1, The Gore Road appears to be a completely conventional suburban arterial in an area that will gradually mature over time.

Figure 1 Typical Four Lane Cross Section



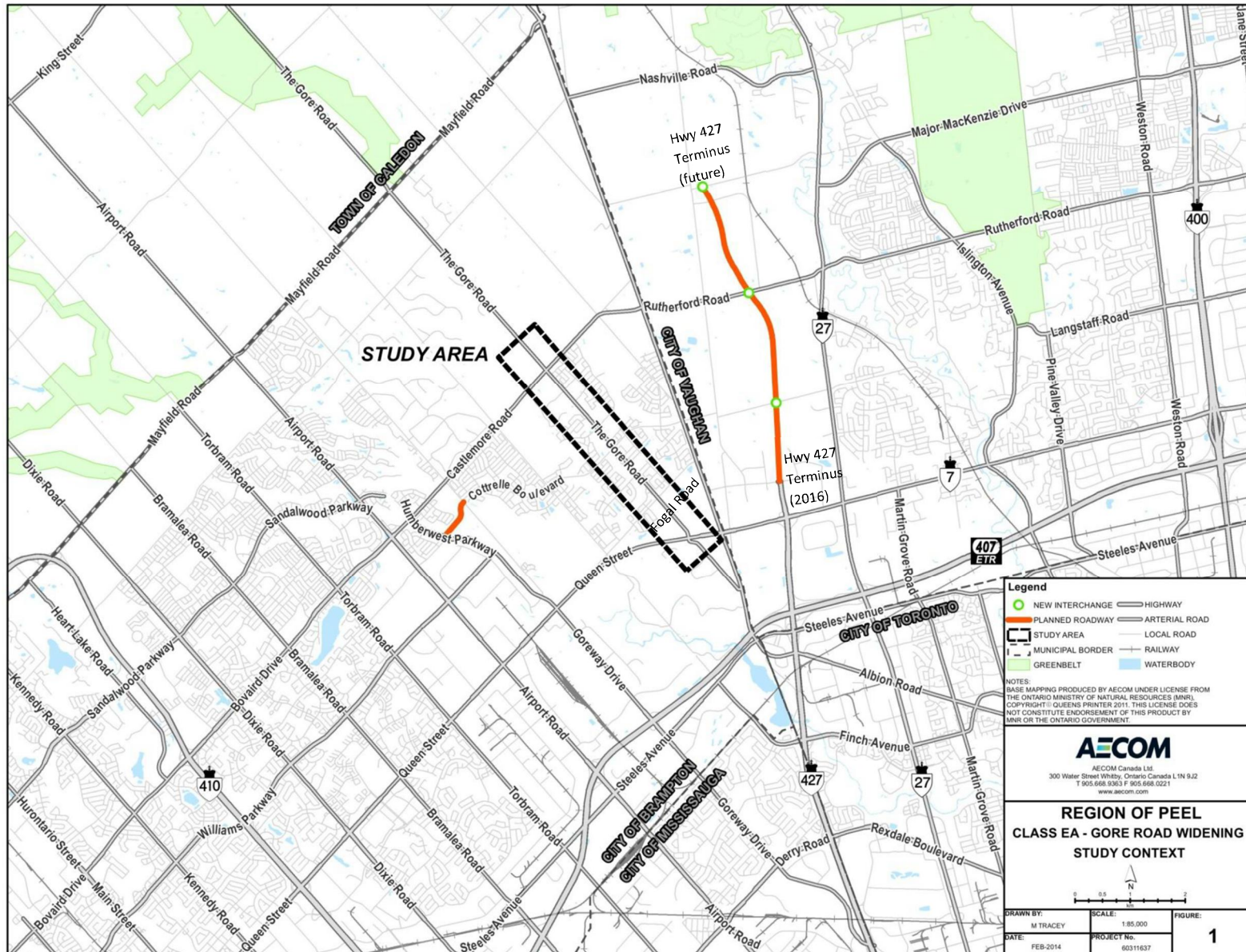
## Future Plans

Given the recency of the widening, The Gore Road does not currently suffer from severe or chronic traffic congestion. There are eleven signalized intersections in the study area and the Region has prohibited heavy trucks from using The Gore Road south of Castlemore Road. The only notable current traffic “problem” stems from The Gore Road’s alignment within the area road network, whereby (as shown in Figure 2) it functions as part of a multi-route funnel for traffic destined to the northern terminus of Highway 427, located 1.8 km to the east of the south end of The Gore Road. Traffic from within and beyond the study area channels to The Gore Road each weekday morning and turns left at Fogal Drive and at Queen Street. Queen Street is itself heavily used for east-west auto, truck, and transit demand; the result is that the double left turn on southbound The Gore Road operates at capacity.

Highway 427 is planned to be extended north past Fogal Drive (refer to Figure 2) within the next few years, with new interchanges at Cottrelle Boulevard, Castlemore Drive, and further north. The Fogal Drive access will be closed at that time, but the Queen Street interchange will be relieved somewhat by the new interchanges to the north. Demand on The Gore Road, however, is anticipated to grow due to local infill and substantial expansion of Brampton’s urban development to the north. Buses operate on The Gore Road, but transit demand in the area is more oriented east-west, so creating bus-only lanes in the corridor is not a significant consideration.

On balance, the relief offered by the Highway 427 extension will be more than offset by the travel demands generated by new development. As a consequence, the Region’s Long Range Transportation Master Plan (LRTMP) identified the need for The Gore Road to be widened to its planned ultimate six lane configuration in the early part of the next decade. Funds for the widening were set aside in the Region’s Ten Year Capital Plan, and the Region consequently initiated an Environmental Assessment study for the six-laning in 2013, retaining AECOM Canada Ltd. for consulting planning and design services.

Figure 2 The Gore Road Within the Area Road Network



## The Environmental Assessment Study Begins

The study began in a conventional manner, with the collection of plans and field information regarding existing conditions, much of which was readily available from the recently-completed four-laning project. The advanced timing of the six-laning study, however, meant that there was little interest in or awareness of the new study by the public; there was little apparent “need” based on current operations. Furthermore, with the housing in the area being relatively new and a significant proportion, if not the majority, of the residents being not only new to the area but new to Canada, there is not an established tradition of community or business involvement in such studies. The local schools, places of worship, and community centre form the key hubs where community interaction occurs, so the study team paid particular attention to making leaders in those facilities aware of the study.

Initial study findings revealed a few constraints and issues that would challenge the six-laning concept:

- The Gore Road has an awkward S-curve alignment in order to set up a perpendicular crossing at Queen Street (Photo 2); with double left turns and channelized right turns, it is not friendly for pedestrians or transit users, and the double lefts conflict with one another and force an inefficient signal operation at a critical location.
- At the Ebenezer Road intersection, a heritage church and cemetery on one side kitty-corner from a heritage community hall (recently shifted a few metres west to accommodate the four-laning) would make six-laning difficult.
- The two creek crossing structures (Photo 3) had been kept as narrow as possible during the four-laning in order to avoid impacting the creek bed; six laning would bring the creek hydraulics (the road is overtopped at Regional flood levels), fluvial geomorphology, and natural environment into consideration. The sidewalks on the bridges are relatively narrow and have splash guards, which hamper snow clearance in winter.
- The public school on the west side of The Gore Road draws almost all its students from the east side, served by a signalized crosswalk; the prospect of two more lanes to cross raised safety concerns on that front.
- There are no provisions for cycling in the corridor, despite the 70 km/h speed limit and the three schools present; school children and residents tend to cycle on the sidewalk, or not cycle at all.



These challenges were not insurmountable in and of themselves, and the study team developed a feasible six-lane plan per the Region's objectives. However, the traffic modelling done as part of the study area review revealed the interesting situation whereby widening The Gore Road was not seen to actually yield an improvement in future traffic conditions. With the southbound double left turn onto

Queen Street at the end of the corridor already operating at capacity, funneling even more traffic into that bottleneck made little sense. Even with the reassignment of travel demand to new double lefts at Cottrelle Boulevard and Castlemore Road to feed future traffic to Highway 427 and destinations to the east, operating conditions on the rest of The Gore Road would remain good into the foreseeable future.

This analysis called into question the need – and assumed benefit – of widening the road beyond some site-specific intersection modifications. It went further than that, for the assumptions underlying the whole regional LRTMP were challenged - if The Gore Road could not play an effective role in the network as a high-capacity arterial, where would the traffic go? Additional model iterations with four- and six-lane configurations demonstrated how traffic could disperse across the network and into the shoulders of the peak period when the capacity of The Gore Road was taken as constrained by the southbound double left turn movements at key intersections. Whether the road was four lanes or six lanes had little impact on the outcome, which helped confirm that the additional midblock capacity with two added lanes was unnecessary.

### A New Direction

After considerable debate, the two streams of inquiry came together to formulate a decision: with the observed negative physical impacts of widening and the apparent lack of functional benefit from increasing midblock auto capacity, Regional staff and leadership agreed that the roadway should stay at four lanes for the foreseeable future. Not only that, they seized on the opportunity created by having an active study, the beginnings of an engaged community, available funding (from the budgeted widening), and policy / political / community support to not simply terminate the study, but to recast it as a “Complete Streets” study that would use The Gore Road as a Showcase Project to help the Region develop plans and strategies to deal with these sorts of issues in other Regional road corridors.

*A “Complete Street” is designed for all ages, abilities and modes of travel. On Complete Streets, safe and comfortable access for pedestrians, bicycles, transit users and people with disabilities is not an afterthought, but an integral planning feature.*  
Source: Complete Streets Canada

The Region’s interest in developing innovative “showcase” elements in the corridor had to be balanced against the desire to minimize negative impacts of the project on the surroundings and the need to reflect the specific constraints and opportunities present. But the ultimate goal of a Complete Streets design is invariably positive; rather than talking about mitigating negative environmental and community impacts, The Gore Road study became a forum for positive, innovative interventions in the status quo so that it becomes a more comfortable, safe environment for those who live in the community and shop and attend the local schools. Underlying the design approach is a desire to avoid or minimize impact on private property by containing all interventions within the existing right-of-way.

### Innovative Approaches

What was missing in The Gore Road that makes it an “Incomplete Street”? After all, it had just been widened and “improved”.

Upon closer examination and thoughtful consideration of the community’s needs, and having observed the corridor function in different conditions (winter snow, commuting peak periods, mid-day, temple and school rushes, and weekends), the study team observed several problems and opportunities. Changes to the corridor design were generated from a “Complete Streets” perspective:

- Queen Street intersection
  - Realignment of The Gore Road would allow southbound and northbound double left turns to occur simultaneously, thereby reducing delays while retaining pedestrian crosswalks on all approaches.
  - Realignment would also permit elimination of two of the four free-flow channelized right turns, to create a safer pedestrian and cyclist environment.
  - A carefully-designed larger island in the northwest quadrant would allow the southbound bus stop to be moved 50 m closer to the intersection, to better serve transferring bus passengers; a “Smart Channel” design brings right turning vehicles to a stop before turning, rather than providing a free-flow move that challenges pedestrians to cross the roadway safely.
  - Any roadworks had to protect for active development plans on both east side quadrants.

Refer to Figure 3 for an illustration of the proposed intersection design.

Figure 3 Proposed Queen Street / The Gore Road Intersection Design



- Orange square: Cycle track
- Green square: Sidewalk
- Yellow square: Multi-use Trail
- Grey square: Bus Stop
- Red square: Bus Bay
- Purple line: Existing ROW
- Red dotted line: Proposed ROW for Future Development
- Yellow dashed line: Proposed Property Line

0 25m 50m



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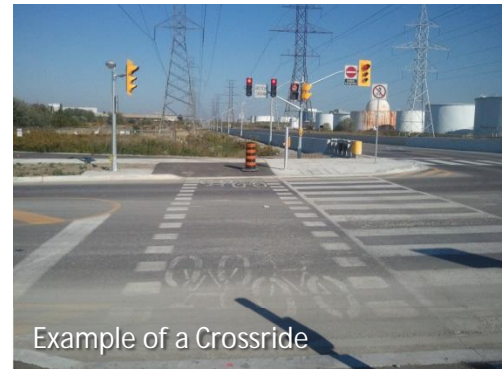
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- Bus stops
  - Creating a consistent far-side bus stop configuration allows transit signal priority to function effectively.
  - Implementing bus bays / pullouts wherever feasible ensures peak AM and PM traffic volumes don't get queued behind stopped buses along the corridor (refer to Figures 3 and 4).
  - Where right turn lanes exist, they can function as queue jump lanes for buses who can drive straight through to enter a far side bus bay.
  
- Speed Limit reduction
  - The Gore Road, in the study area, has a posted speed limit of either 60 km/h or 70 km/h, in keeping with its function as Regional Road serving through traffic.
  - The flat and straight alignment does not discourage speeding.
  - The high operating speed is incompatible with a safe and comfortable walking and cycling environment, and particularly discourages on-road cycling.
  - Given the traffic signal frequency and the preponderance of turning traffic, there is little functional benefit (i.e. travel time savings) to motorists to operate at high speeds between intersections.
  - A speed limit reduction to 50 km/h is recommended and was accepted by the Region.
  
- Lane Width reduction
  - The Gore Road currently features the Region's standard 3.65 m wide traffic lanes, even though heavy trucks are prohibited from The Gore Road.
  - Narrower lanes would send a visual cue to motorists regarding the reduced speed limit, while creating more space in the right-of-way for cycling facilities.
  - Adjacent urban areas (e.g. City of Toronto) are using 3.3 m lane widths on major arterials.
  - Narrower lanes are contingent on the provision of safe cycling infrastructure, which is part of the recommended plan for the corridor.
  - The through lane widths on The Gore Road are recommended to be reduced to 3.3 m, with the curb lane at 3.5 m in recognition of its use by buses.
  
- Intersection design
  - There are large turning radii at all intersections within the study area, even at intersections with residential streets, despite truck prohibitions along The Gore Road. A

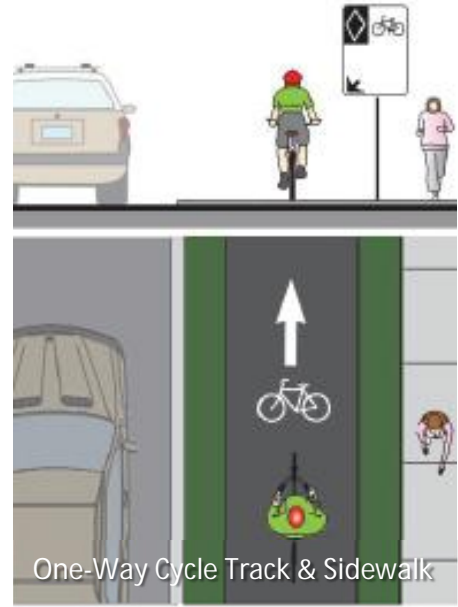
large corner radius encourages drivers to make right-turns at higher speeds than they would at intersections with smaller corner radii. The large turning radii also lead to longer crossing distances for pedestrians. Radii are to be tightened in most locations.

- Right turn lanes can be removed in low-volume locations, but they can remain where they function as queue jumps for far-side bus bays.
  - Crossrides are to be painted alongside pedestrian crosswalks, to reflect cycling needs (as discussed below).
- Active Transportation and Cycling-specific infrastructure



- This is the key “missing element” in The Gore Road at present; the question is how best to retrofit cycling-supportive infrastructure from among the choices of bike lanes, multi-use trails, off-road paths, and cycle tracks. We are looking for an environment in which all types of cyclists will be comfortable. The Regional Health Unit has highlighted an obesity and diabetes problem in east Brampton, so infrastructure that promotes cycling and walking is seen as a health measure, not just a transportation feature. Having Health staff participate in the study’s Technical Advisory Committee helped drive this message home.
- The analytic methodology of the Ontario Traffic Manual Book 18 confirmed that on-street bicycle lanes would not be compatible with the traffic volume, speed, and usage of the corridor. Commuter cyclists may be comfortable with on-street bike lanes, but bike lanes does not fit the “8 – 80” principle of accommodating all ages and types of users.
- With cycling generators on both sides of the corridor, two-way multi-use trails appeared to be an attractive solution which minimized the total paved width in the right-of-way. However, concerns were expressed about potential conflicts within the path among all its various users – recreational and commuter cyclists, schoolchildren, dog walkers, pedestrians young and old – and some ambiguity about how cyclists using such paths are treated at intersection crossings. The path becomes a pedestrian-only crosswalk when crossing a street, so cyclists are (legally) obliged to dismount and walk their bike across; this is among the most widely ignored traffic rules in Ontario.
- The Region of Peel has not implemented any cycle tracks (bike-only lanes physically separated from the road by being set at sidewalk, not street, level) to date, but their growth in Toronto indicates their acceptability as a new strategy. Cycle tracks were selected as the best approach for The Gore Road, to provide a safe cycling environment alongside a dedicated pedestrian sidewalk system. The boulevards will be completely reconstructed to accommodate narrowed lanes, cycle tracks, bus bays, and sidewalks.

- Cycle tracks are intended to function in one direction, so are linked by crossrides at each intersection. Path connections are recommended at selected locations to link the Gore Road facilities to nearby recreational path and bike lane segments.

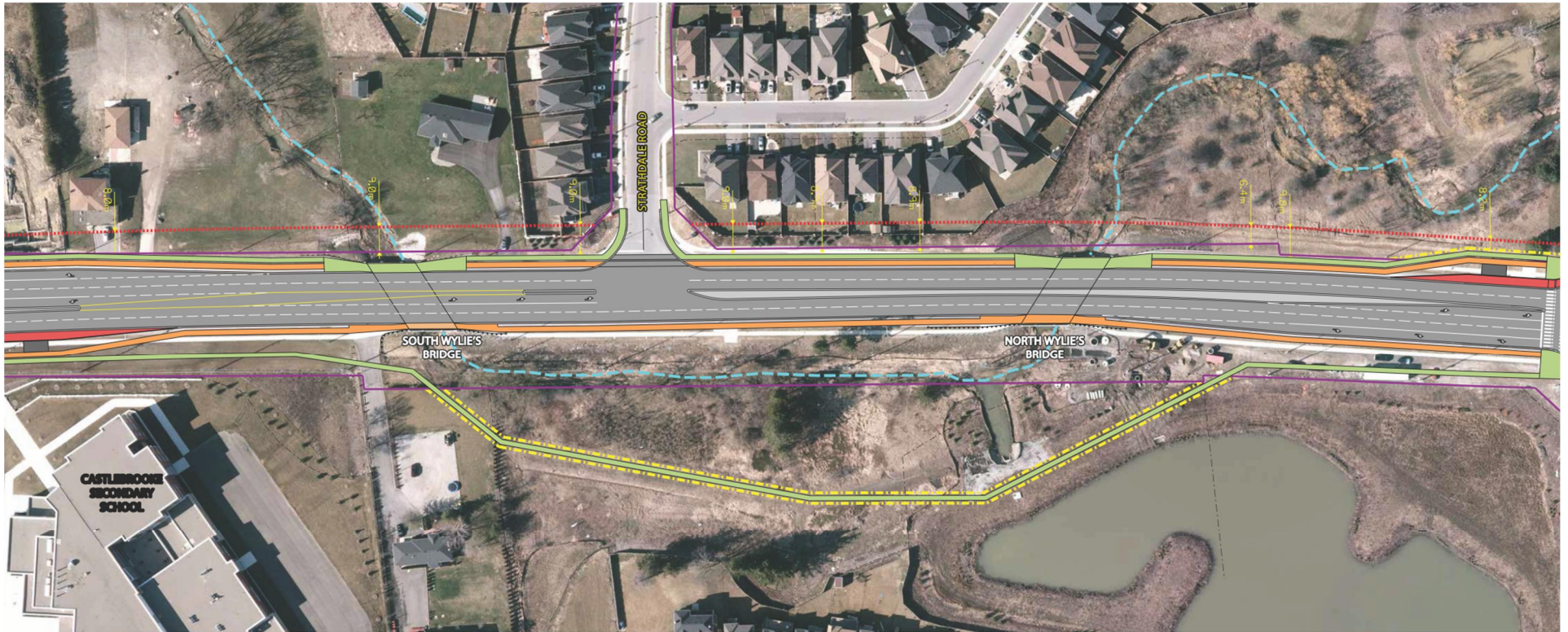


- Humber River Tributary (Wylie's Creek) Bridges

- The decision to maintain The Gore Road at four lanes avoided most of the issues associated with widening or replacing the two bridge crossings (250 m apart) in the study area. However, the introduction of cycling facilities means that the bridge decks are not wide enough to accommodate both sidewalks and cycle tracks.
- Creating new pedestrian or cycle structures immediately adjacent to the road bridges would be costly and trigger significant concerns about impact on the streambed, fluvial geomorphology, hydraulic capacity, and overall feasibility. Instead, the study team proposed a reconfiguration of the roadway to allow four lanes, a reduced-width median, sidewalks, and a west-side cycle track within the existing bridge deck. The east-side cycle track is altered into a multi-use trail that veers off the road alignment and passes through a natural area to the east of the creek (which stays immediately adjacent to the road). Refer to Figure 4 for an illustration of the multi-use trail.
- This east-side trail travels on a berm holding back a municipal stormwater management pond and is links the two secondary schools in the corridor. Refer to Figure 4 for an illustration of the multi-use trail.
- During the study, the study team engaged a Grade 11 Environmental Studies class in a corridor school by presenting professional information, working with them outdoors (refer to Photo 4) (around the Humber River tributary) to measure and record actual field conditions, help assemble and analyze the data in the classroom, and observe their presentations. Staff included an arborist, a biologist, a municipal engineer, and a fluvial geomorphologist. The spoke to the students not only about the study but about their own interests and careers. The new multi-use trail offers an opportunity to build on that experience to create an educational laboratory environment for area students and the public at large, along with explanatory displays about area trees, the aquatic environment, the stream's evolution, birds and animals, cultural heritage, and stormwater management.



Figure 4 Humber River Tributary (Wylie's Creek) Bridges



- Cycle track
- Sidewalk
- Multi-use Trail
- Bus Stop
- Bus Bay
- Existing ROW
- Proposed ROW for Future Development
- Proposed Property Line

0 25m 50m



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- Stormwater Management / Low Impact Design (LID)
  - Maintaining a four-lane roadway within a 46 m right-of-way that is wide enough for six lanes preserves an opportunity, recognized by the Region of Peel and the Toronto Region Conservation Authority (TRCA), to implement LID stormwater management practices to complement the existing conventional “pipes and ponds” SWM techniques. The approach is to consider the entire road allowance rather than just LID pockets, and the system will be designed to mimic the natural hydrology of the area.
  - A TRCA permit in principle is also going to be pursued during the Class EA process to ease the transition from Class EA planning work to detailed design and construction.



### Conclusions

The Gore Road study successfully challenged the orthodoxy of widening suburban arterial roads to the physical maximum accommodated in their designated rights-of-way based on long-range traffic modelling and growth forecasting. Limited site-specific interventions were found to be an adequate response to the traffic needs, while the rest of the right-of-way was transformed in a way that promotes active transportation, helps make the public space usable and comfortable for the surrounding community, minimizes negative impact, and drives integration of the adjacent lands uses (schools, plazas, places of worship, subdivisions) with the broad corridor at its heart.

Collectively, all of the innovative strategies developed in the study represent a big step forward for the Region of Peel in viewing their arterial road system from a “Complete Streets” perspective. Not every Regional road is suited to such interventions, and The Gore Road certainly benefits from an unusual combination of circumstances, but the best way to gain confidence as an organization with a new approach is to implement it and learn from it.

Even the consultation and engagement process for the EA study had innovative elements. A multi-agency technical workshop, stakeholder sessions that included both agency staff and advocacy groups, public consultation in a community centre hallway rather than in a “back room”, one-to-one sessions with senior representatives of every school and place of worship in the corridor, hand-delivered “door hanger” notices and post cards, and the school class engagement were all helpful in both drawing out community perspectives on the study and in helping the Region understand where extra effort yielded added value to the process.

At the end of the day, strong support for the study recommendations was noted from those who participated, which in turn helps underlie political support for following through with implementing the recommended plan as a Showcase Project for the Region of Peel.

## REFERENCES

Region of Peel. *Peel Long Range Transportation Plan Update 2012*.

Region of Peel. *Road Characterization Study*. May 2013