TORONTO

REPORT FOR ACTION

Potential Intersection Alteration - Danforth Avenue and Main Street

Date: June 23, 2022
To: Toronto and East York Community Council
From: Director, Project Design & Management, Transportation Services
Wards: Ward 19, Beaches-East York

SUMMARY

In December 2021, City Council approved the temporary ActiveTO Cycling Network Expansion projects installed in 2020 as permanent installations, including the Danforth Avenue cycle tracks, parking and loading areas and motor vehicle operational changes from Broadview Avenue to Dawes Road.

In December 2021, the local Councillor requested Transportation Services staff provide a design solution that includes an eastbound right-turn lane on Danforth Avenue at Main Street to address concerns of traffic congestion and delays on Danforth Avenue, between Woodbine Avenue and Main Street. .

Transportation Services staff reviewed the intersection and do not support a design for an eastbound right-turn lane. Every effort was made to achieve the objectives requested and mitigate risks to the best of our ability. The design solution remains sub-standard in a number of areas and therefore, Transportation Services does not support the potential alternation of the Danforth Avenue and Main Street intersection outlined in this report.

As Toronto Transit Commission (TTC) operates transit service along Danforth Avenue, City Council approval of this report is required.

RECOMMENDATIONS

The Director, Project Design and Management, Transportation Services recommends that:

1. City Council not authorize the alteration of the Danforth Avenue and Main Street intersection to include an eastbound right-turn lane on Danforth Avenue as shown on "Eastbound Right Turn Danforth Ave and Main St Design, dated May 2022" attached to

the "June 23, 2022 Potential Intersection Alteration - Danforth Avenue and Main Street" report from the Director, Project Design and Management, Transportation Services.

FINANCIAL IMPACT

If City Council amends the recommendations in this report and authorizes the alteration of the Danforth Avenue and Main Street intersection to include an eastbound right-turn lane on Danforth Avenue, the estimated cost associated with the amendment is $20,000. Funding would be subject to availability and competing priorities within the Transportation Services 2022 Capital Budget.

DECISION HISTORY

Toronto City Council, at its meeting on December 15, 2021, adopted item IE26.10, which approved the ActiveTO Cycling Network Expansion projects installed in 2020 currently in place as permanent bikeways, and in doing so, authorized the necessary by-law amendments, to retain them as permanent installations, including Danforth Avenue (cycle tracks from Broadview Avenue to Dawes Road), along with an extension of Victoria Park Avenue to be installed in 2022.
http://app.toronto.ca/tmmis/viewAgendaItemHistory.do?item=2021.IE26.10

COMMENTS

The Destination Danforth Complete Street pilot project was installed in the summer of 2020 along Danforth Avenue from Broadview Avenue to Dawes Road as part of the City's ActiveTO temporary Cycling Network Expansion program. The pilot was implemented to support local businesses, improve safety and comfort for all users, and enable people to use all modes of transportation along the corridor. The Destination Danforth project included:

- A separated cycle track in both directions;
- One westbound and one eastbound traffic through lane, and turn lanes at intersections;
- All hours parking/loading lanes on both sides of the street;
- Streetscape improvements such as planters and artistic curb extensions;
- New and expanded curb lane and sidewalk patios;
- Leading Pedestrian Intervals (LPIs) at key crosswalks;
- Art installations through traffic box wrappings and murals;
- High-capacity bike parking; and
- New Bike Share stations.

In 2021, additional improvements were implemented including optimization of traffic signals, changes to some turn lane configurations and signalization at select intersections, and additional improvements to accessibility.

The pilot was evaluated between the summer of 2020 and fall of 2021. In December 2021, City Council approved the ActiveTO Cycling Network Expansion projects installed in 2020 currently in pace to be retained as permanent installations, including the Danforth Avenue cycle tracks from Broadview Avenue to Dawes Road.

The local councillor has raised concerns of traffic congestion between Woodbine Avenue and Main Street, specifically in the eastbound direction during the PM (afternoon) peak period. Subsequently, the local councillor requested City staff to investigate the issue and come up with a design solution to include an eastbound right-turn lane at Main Street, while maintaining the cycle tracks in both directions.

Existing Conditions

Danforth Avenue is a Major Arterial roadway, with one motor vehicle lane in each direction, cycle tracks, sidewalks and loading/parking areas on both side of the roadway. The posted speed limit is 40 km/hr. The roadway pavement width of Danforth Avenue at Main Street is 16.3 metres and the cycle track width is 1.8 metre. Danforth Avenue and Main Street is a signalized intersection. The east-west lane configuration includes:

- Westbound lanes: dedicated left-turn (3.0 metre), through (3.3 metre) and right-turn (3.0 metre)
- Eastbound lanes: dedicated left-turn (3.0 metre) and through (3.3 metre)

Toronto Transit Commission (TTC) operates the "300 Bloor-Danforth" night bus route that stops on the north side of Danforth Avenue just east of Main Street, and the south side of Danforth Avenue just west of Main Street. TTC buses make all turns at this intersection, either entering or leaving the Main Street Station. In addition, in the event of a subway service disruption along Line 2 that affects Main Street Station, TTC shuttle busses would need to access the station turning right westbound and left eastbound.

Traffic counts were conducted on Danforth Avenue before (Fall 2019) and after (Fall 2021) the installation of the Destination Danforth Complete Street project. The average motorist vehicle travel time on Danforth Avenue for eastbound and westbound traffic between Woodbine Avenue and Dawes Road was compared during the morning and afternoon peak periods. The analysis found that generally, peak period travel times did not change significantly when comparing the fall of 2019 (pre-pilot) to the fall of 2021 (following pilot implementation). The average afternoon peak period experienced no change in travel time for the westbound direction, and an average increase of 0.5 minutes for the eastbound direction. The average morning peak period experienced a decrease of 1.1 minute for the westbound direction in travel time, and an average increase of 0.1 minute for the eastbound direction.

Requested Changes

City Staff reviewed the request to add a right-turn lane in the eastbound direction on Danforth Avenue at Main Street. The major design considerations include:

- Ensure safety of all road users including maintaining separation of the cycle tracks;
- Accommodate operation of Toronto Transit Commission (TTC) buses; and

- Maintain accessible boarding/de-boarding area on the north side of Danforth Avenue approximately 40 metre west of Main Street (in front of 2526 Danforth Avenue)

While Transportation Services does not recommend the below lane configuration on Danforth Avenue due to the sub-standard lane width, safety concerns and geometric issues that are discussed in more detail later in this report; a design was prepared and is shown in Figure 1.

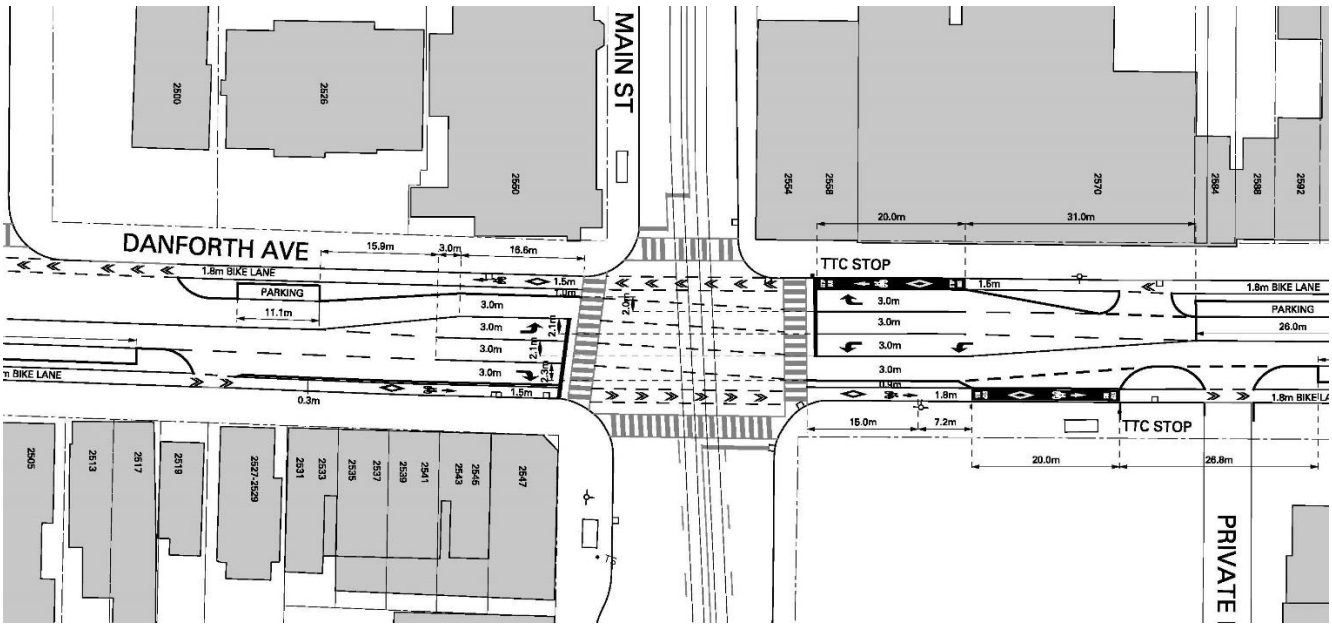

Figure 1: Design for Addition of Eastbound Right-Turn Lane on Danforth Avenue at Main Street

The design includes a left-turn, right-turn and through lane in both the eastbound and westbound directions along Danforth Avenue. The following changes would be needed to accomplish these lane configurations:

- Through lanes reduced to 3.0 metres (0.3 meters below the City Standard);
- Increased lane shifts/offsets through the intersections, 2.1 meter shift in the through lanes heading eastbound and westbound (City Standard is a maximum lane shift of 1.5 meters);
- Reduction in parking and loading (from 29.9 metres to 11.1 metres) on the north side of Danforth Avenue; and
- Decreased westbound and eastbound left-turn storage lengths, potentially eliminating most of the queueing space for the eastbound left-turn lane due to requirement to move the stop bar back (west) by 16 metres to accommodate truck and bus turns, which could result in unintended impacts from left-turning motor vehicles blocking the eastbound through lane.

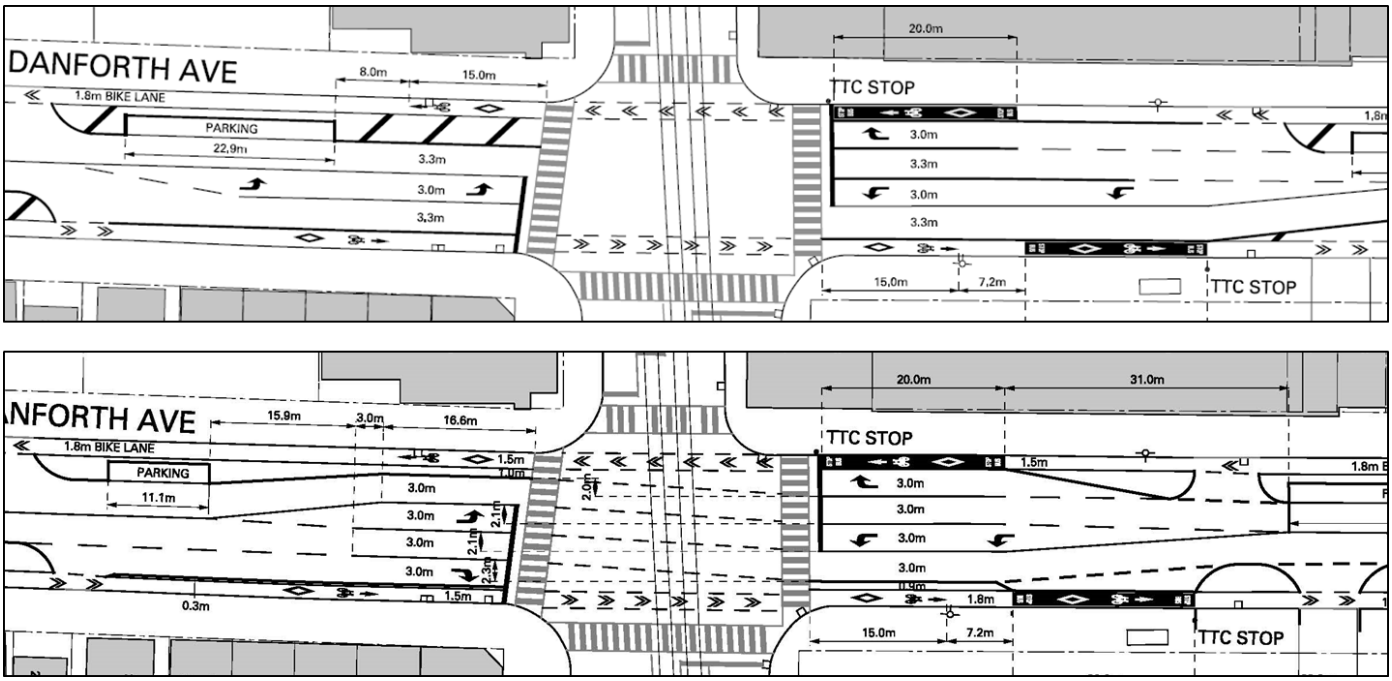

Figure 2: Existing Conditions (top) and Draft Design With Eastbound Right-Turn Lane (below)

Site Traffic Observations

To review the impacts of the potential introduction of eastbound right-turn lane, Transportation Services staff conducted site visits on Tuesday May 10, 2022 between 4:50 to 5:30 p.m., Friday May 20, 2022 between 8:00 to 8:45 a.m., and Wednesday June 8, 2022 from 3:30 to 4:15 p.m. Staff observed the following:

- Eastbound traffic was heavier in the p.m. time periods;
- Eastbound through vehicles were mostly able to go around a single right-turning vehicle;
- When the left-turn lane was empty vehicles used this area to pass right-turning vehicles as well;
- Right-turning vehicles were rarely held up by crossing pedestrians;
- The length of the eastbound queue varied. Some signal cycles it was backed up to almost Westlake Avenue, while at other times there were only a few vehicles; and
- At times motor vehicles driving eastbound could not enter the Danforth Avenue and Main Street intersection due to stopped vehicles east of the intersection.

During these site visits, Transportation Services staff generally did not observe traffic blocked by the eastbound right-turning vehicles.

Based on site observations the addition of an eastbound right-turn lane would have a limited or no effect on mitigating traffic delay at the Danforth Avenue and Main Street and likely not provide any improvement to the overall travel time along the Danforth Avenue corridor.

Significant Safety Concerns with Sub-Standard Conditions

Lane Shift

The existing conditions at Danforth Avenue and Main Street have no lane shift. The eastbound lanes do not conflict/overlap with the turn lanes. As per the City of Toronto Road Engineering Design Guidelines, Curb Extensions Guideline the maximum lane shift is 1.5 metres (overlap between the eastbound and westbound lanes). The potential design, not recommended by Transportation Services, would involve a lane shift of 2.1 metres between the eastbound left turn lane and westbound through lane, as well as a 2.1 metre lane shift between westbound left turn lane and eastbound through lane. Increasing the lane shift increases the risk of head-on collisions.

Reduced Lane Widths

As per the City of Toronto Lane Widths Guidelines, a minimum of 3.3 metres is required for the eastbound through lane to accommodate TTC buses and large vehicles. The potential design would involve an eastbound through lane of 3.0 metres. The combination of lanes at and below the minimum standard increases the risk of side-swipe collisions. This combination of lane widths adjacent to the eastbound cycle track is not recommended.

Reduced Storage or Elimination of Eastbound Left-turn Lane

The draft design would need to be adjusted to accommodate truck/bus turns. Preliminary AutoTurn analysis was conducted to determine truck and bus southbound right-turns and northbound left-turns onto Danforth Avenue. To accommodate the truck and bus turns, the eastbound left-turn lane stop bar would likely need to be setback by approximately 16 metres, thus potentially reducing the length of or eliminating the eastbound left-turn queue lane, which could result in unintended impacts from left-turning motor vehicles blocking the eastbound through lane.

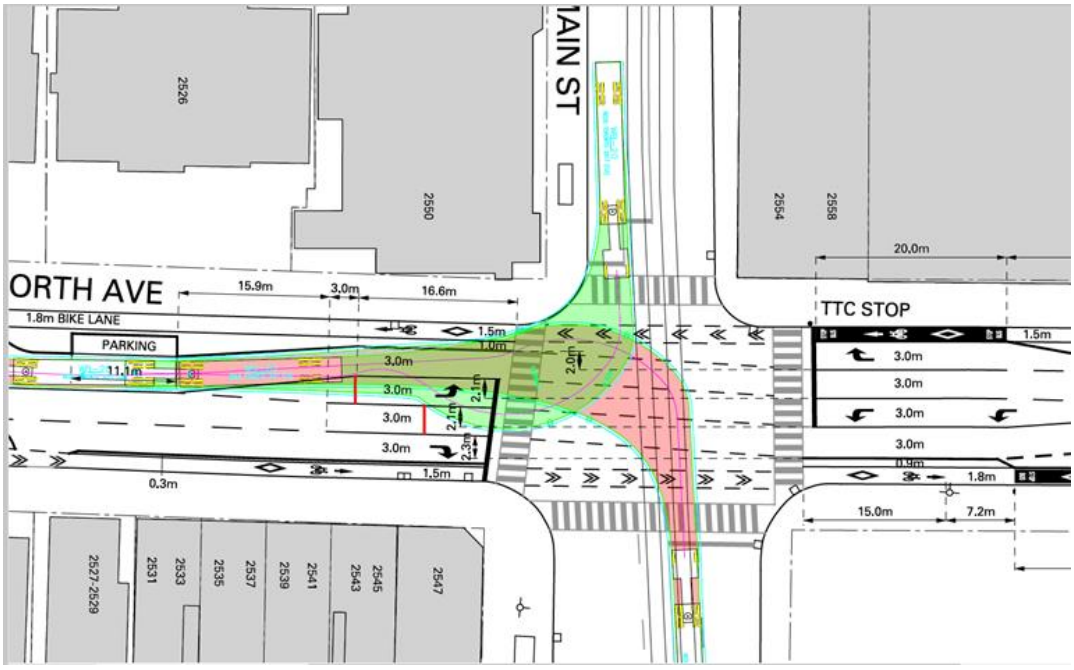

Figure 3: AutoTurn Diagram Indicating Truck/Bus Turn Movements and Requirements (red lines on roadway indicate potential new location of stop bars)

Potential Intersection Alteration Danforth Avenue and Main Street

The significant safety concerns outlined above are risks that cannot be adequately mitigated due to the constrained roadway width of Danforth Avenue at this location.

Conclusion

Based on site observations the addition of an eastbound right-turn lane would have a limited or no effect on mitigating traffic delay at the Danforth Avenue and Main Street and likely not provide any improvement to the overall travel time along the Danforth Avenue corridor.

Further, Transportation Services does not recommend the potential design as it does not meet the minimum requirements of the City Road Engineering Design Guidelines for lane shift and lane width. As a result, the changes could be less safe than the existing condition and could lead to increased risk of collisions - a risk that cannot be adequately mitigated.

Transportation Services does not recommend the installation of the right-turn lane, based on both the findings from site observations, as well as significant safety concerns with the sub-standard conditions described in this report that the requested design would involve.

The TTC has been requested to provide feedback on the potential right-turn lane design. During the preliminary discussions, TTC expressed concern for the reduced through lane widths as their vehicles require 3.3 meters.

The Ward Councillor has been advised of the recommendation of this staff report.

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SIGNATURE

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ATTACHMENTS

Attachment 1: Eastbound Right Turn Danforth Ave and Main St Design