

Community Concerns about Traffic Congestion Associated with Stadium Shopping Centre Redevelopment

(Reference: Development Permit DP2016-0305)

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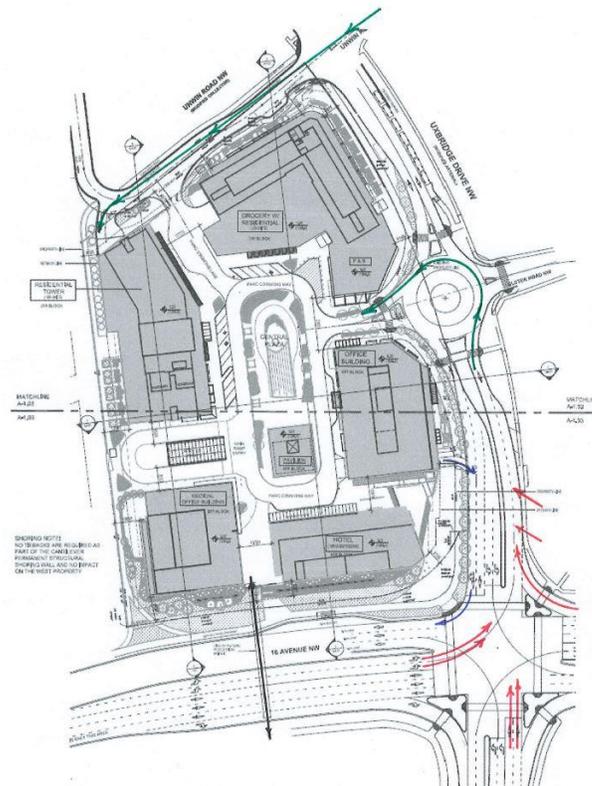
1. Introduction

The community of University Heights (UH) is surrounded by major developments involving additional employment, residents and traffic in the next few years. These developments will have major negative effects upon UH if policies to resolve associated problems are not implemented. The issues go beyond the Stadium Shopping Centre (SSC) site to the growth of traffic along 16th Ave, the consequences of the new Cancer Centre (employment/visits), the growth of University District (residents/jobs) and planned expansion of the University of Calgary (UC) of potentially 10,000 new enrolments plus faculty and support staff, as well as a possible Field house or other developments in the Foothills Sports Area.

This document details specific University Heights Community Association (UHCA) concerns about traffic flows on the redeveloped SSC site and in its immediate vicinity, and pedestrian/cyclist safety issues associated with these traffic flows. A summary of the principal concerns appears at the end, and brief notes on the backgrounds of the authors of this document are provided in the Appendix.

2. Traffic Flows Into and Out of SSC

Below is a SSC site image from page 4 of the Development Permit Application (DPA) plans submitted by Western Securities Limited (WS), with several possible traffic flows indicated in colour. These flows are utilized in the discussion of traffic concerns below.



Depicted at the top of the image is a flow (in green) representing West Bound (WB) traffic along Unwin Road crossing Uxbridge Drive and then into the site at the northern entry point, directly into the underground parking

structure. Also depicted (in green) is traffic flow on the single North Bound (NB) lane on Uxbridge into the site at the roundabout, the main entry point.

Indicated in red are several possible traffic flows NB into UH from 29th Street and 16th Ave. There are two left-turn flows off 16th Ave into Uxbridge, two flows north on 29th Street, one flow WB from the right turn lane off 16th Ave, and two possible flows from the Tim Horton's/Shell station.

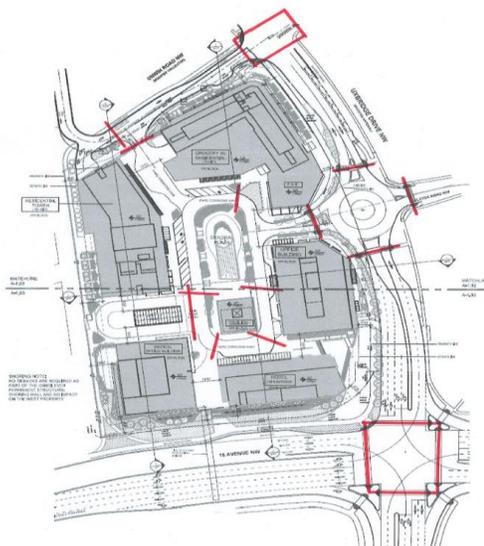
Another flow (in blue) shows traffic flow exiting the underground parking structure SB onto Uxbridge and a second flow (in blue) shows traffic turning right off Uxbridge onto 16th Ave. The final flow (in black) is a bi-directional pedestrian flow using an overpass to be constructed over 16th Ave west of the 16th Ave/Uxbridge intersection.

3. Multiple Traffic Streams Merge into One Traffic Stream North Bound on Uxbridge Drive

Not all flows NB onto Uxbridge (in red) can occur simultaneously, *but all flows must merge to a single lane to enter the roundabout*. The two flows from Tim Horton's/Shell station may enter Uxbridge regardless of the signal phasing of the traffic signal at the 16th Ave/Uxbridge intersection, but the right turn flow into Uxbridge will be subject to a yield sign. (To avoid collisions, right turn flows at present likely yield right-of-way even in the absence of a yield sign, so the presence of a yield sign is unlikely to alter future right turn flows much.) Two flows north from 29th St or two left-turning flows from EB 16th Ave to Uxbridge will, depending on the signal phasing, enter the two lanes north on Uxbridge which almost immediately merge into a single lane. If the two twinned flows north or from the EB left-turn lanes are continuous or nearly so, then traffic turning right off 16th Ave may find it difficult to turn right onto Uxbridge, slowing or halting following traffic. At peak travel times this combination of flows may cause traffic to back up to the 16th Ave intersection. Any stoppage of traffic on 16th Ave is a major safety concern.

4. Vehicular Traffic Will Slow When Entering SSC and Slow Further When Moving in the Parking Structures

When entering SSC off Uxbridge at the roundabout, vehicles must slow as they move toward the parking structure entrance (the speed on internal roads will typically be less than the speed on Uxbridge), and they must slow still further as they enter and pass through the parking structure. Nearly all vehicles must access the parking structure because very few surface stalls will be provided. Vehicles must traverse pedestrian crossings on the periphery of and inside SSC and travel through a zone shared with pedestrians and cyclists. Utilizing page 4 of the DPA, the following image shows possible locations of interaction (in red) among pedestrians, cyclists and autos.



The intersection at 16th Ave has four crosswalks controlled by pedestrian signals. Assuming that a traffic signal will be located at the intersection at Uxbridge/Unwin, then pedestrians/cyclists will move according to the signal. Four crosswalks at the roundabout will allow pedestrians to move at will and vehicles must stop for them.

Remaining possible movements are conjectural because it is not known to the community where onsite crosswalks will be located. It is possible that there will be no designated crosswalks and pedestrians/cyclists will be able to use the internal roads at will, potentially slowing or halting vehicle travel when they do. Regardless of the exact locations of interaction on the SSC site, there will be many possible places of interaction between people and vehicles, **where pedestrians and cyclists will usually have the right of way.**

Below is an image taken from page 5 of the pdf circulated by WS of its presentation at the UHCA annual general meeting on January 21, 2016. It displays an “aerial view from the north”, and suggests the many possible on-site interactions among vehicles, pedestrians and cyclists that may occur.



The greatest interactions among pedestrians/cyclists/autos will likely occur during the afternoon peak travel period. There will be on-site pedestrian/bicycle traffic between buildings, some of which will access the central plaza/pavilion, crossing internal roads. Darkness in winter, or heavy rain or snow, will worsen hazards associated with these interactions. Stoppages may also occur because of vehicle congestion within the parking structure, such as when drivers passing through the structure slow to enter parking stalls, when drivers back out of stalls into the path of oncoming autos, or as people walking to/from their parked cars cross the paths of auto traffic.

During these on-site stoppages, a queue of vehicles will likely build up on site, and traffic intending to enter SSC at the roundabout may likewise build up or stop because it cannot enter the site. Stopped traffic will delay all following NB traffic on Uxbridge, causing traffic to build up at 16th Ave/Uxbridge. Stopped vehicles at the roundabout may also halt SB vehicles on Uxbridge if they block the SB lane of traffic into the roundabout, with implications for traffic at Uxbridge/Unwin. These consequences can easily be seen by examining the first image in this document. One impact is an increase in the risk to pedestrians crossing at the roundabout when traffic is stopped and if it blocks a pedestrian crosswalk. Cycle traffic is also at increased risk given that there is no Complete Streets version on the east side of Uxbridge, possibly resulting in cyclists weaving in and out of stopped

traffic (commuter cyclists will not likely use the pathway on the west side of Uxbridge). Significant queuing also has an adverse impact on transit timetables and emergency vehicle access to SSC, Foothills Medical Centre (FMC) and the UH community.

Pedestrian traffic using the east-west pedestrian crossings at the roundabout may present delay and safety problems. East of Uxbridge Drive there is a well-patronized Tim Horton's outlet and the large rental housing and apartment accommodations that serve upwards of 2000 residents. Some or many of these residents will probably access retail outlets at SSC following redevelopment and many of the SSC residents will access Tim Horton's after redevelopment. It seems highly unlikely that many pedestrians from SSC will walk the extra distance to the signalized intersection at 16th Ave/Uxbridge, wait for a light change, cross Uxbridge and then walk to the Tim Horton's outlet when utilizing a pedestrian crossing at the roundabout is shorter. Thus pedestrian traffic is likely to use the east-west crosswalks at the roundabout during many daylight hours, including peak travel demand hours. Some of this pedestrian traffic will slow or stop NB or SB traffic or both on Uxbridge.

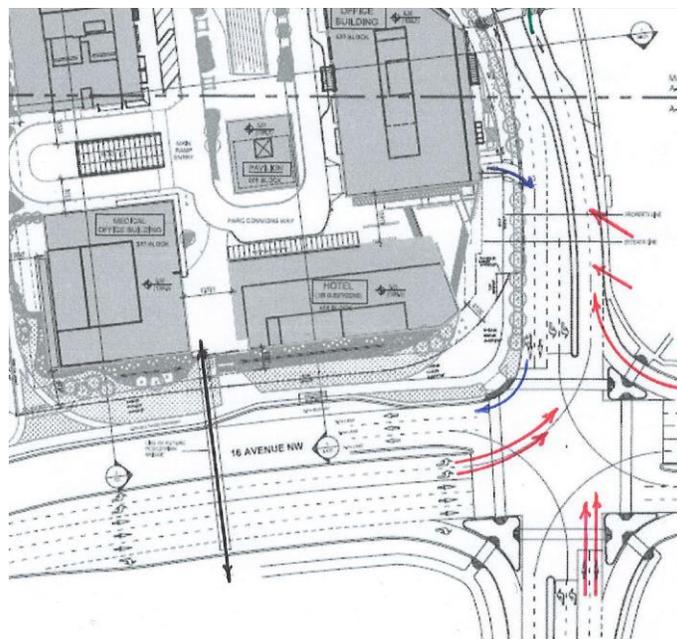
Particularly noteworthy is that many children living in the rental housing and apartment accommodations presently cross Uxbridge and the site to attend University School in the morning and return home in the afternoon. Following SSC redevelopment, many of these children will utilize an east-west crosswalk at the roundabout and SSC internal roads and pathways. There will be considerable risk to safety for these children and the potential for them to obstruct on-site and Uxbridge vehicular traffic. Development of a Complete Streets profile on the east side of Uxbridge, combined with an education initiative through the school to have children use the signalized intersection at Unwin and Uxbridge to cross Uxbridge would help alleviate these concerns.

Severe congestion of the primary access to all parts of the community is a significant negative impact on safety and transit and emergency vehicle access which most likely cannot easily be mitigated with the current traffic patterns.

5. No Consideration of Stopped or Interrupted Vehicular Traffic in SSC or on Uxbridge Drive

Although the SSC Final TIA considered and discussed smooth and heavy traffic flows, it did not discuss the consequences of stopped or much slowed traffic on what are now envisaged as Complete Streets. Presently, traffic on Uxbridge near the existing SSC is often heavily congested at the afternoon peak coinciding with the 3 p.m. shift change at the Foothills Hospital and local school dismissal times. In particular, about a dozen school buses drive east and south on Uxbridge from the Westmount Charter School around 3:30 p.m. each school day. How will Uxbridge accommodate the 39% increases in afternoon peak traffic flow (both directions, per hour) projected in the SSC Final TIA? Using traffic flows from Figures 4 and 16 in the SSC Final TIA, these increases will be from 819 to 1137 vehicles on Uxbridge immediately south of Unwin, and from 1123 to 1565 vehicles on Uxbridge immediately north of 16th Ave. These figures were associated with traffic in February, not a high volume month.

Referring to the image below (the bottom right of the very first image above), the proposed parkade exit SB onto Uxbridge may also generate slowdowns/stoppages as vehicles emerging from the exit (indicated in blue) intending to turn left onto 16th Ave move at least two lanes east to enter a turn lane. They may have to cross the paths of vehicles SB on Uxbridge emerging from the roundabout, congesting that traffic.



In addition, drivers presently turning right onto 16th Ave from Uxbridge utilize the turn lane of an existing “pork chop” at the northwest corner of the intersection. They can follow a traffic lane which extends nearly to Shaganappi Trail, allowing them much time to merge onto WB 16th Ave. In the DPA the “pork chop” has been removed (see the turning flow in blue above) and hence drivers on SB Uxbridge intending to turn right will have to wait until the stoplight allows them to do so or they are able to turn “right on red”. During the afternoon peak travel period, turning right when allowed by the traffic signal may be slowed by large numbers of pedestrians using the north-south pedestrian crosswalk on the west side of the intersection, and turning “right on red” may be difficult or impossible when WB traffic on 16th Ave crossing the intersection is so heavy that few opportunities arise to merge safely with that traffic. Opportunistic “right on red” turns by impatient drivers may also present safety concerns. The result is that traffic may build in the west traffic lane of SB Uxbridge, interfering with the smooth flow of traffic south of the roundabout, from the parking structure exit to Uxbridge and from north of the roundabout. Removal of the parkade exit onto Uxbridge and reinstatement of the “pork chop” is requested.

A pedestrian overpass will be constructed across 16th Ave linking SSC and the BRT bus stop on the south side of 16th Ave. Apparently, the SSC Final TIA did not consider the choices facing BRT bus travellers. For example, some BRT users entering UH (i) may prefer to patronize Tim’s prior to entering SSC, or (ii) may head to UC directly (not to SSC), or (iii) may head to the rental housing and apartment accommodations east of Uxbridge, or (iv) may prefer not to climb the steps to the overpass and descend on the north side of 16th Ave, especially if the surface route is shorter. Thus, pedestrians may choose to cross at the intersection. Placement of the BRT bus stop relatively close to the intersection will also encourage intersection use by pedestrians. These possibilities suggest a need to focus on pedestrians in all four possible crosswalks at 16th Ave/Uxbridge. If large numbers of pedestrians cross, they may impair the effectiveness of one or more of the four sets of dual left hand turns, congesting intersection traffic.

Another possibility is that vehicles in the left-hand turn lanes on 16th Ave EB, or in the 29th St NB through lanes, enter the intersection to proceed onto Uxbridge but cannot do so because of stopped vehicles on Uxbridge. Vehicles stopped in the intersection will most likely interfere with east-west traffic flow on 16th Ave.

Given the somewhat random movements of people, cyclists and autos, some of these adverse interactions are highly likely, slowing traffic to a crawl or stopping it entirely on Uxbridge. Worsening these prospective outcomes

is the following well-known heavy traffic phenomenon. If a group of autos are stopped in a lane of traffic and the source of the stoppage is removed, then the autos will start to move. But the build-up of traffic behind the stationary autos will cause the effects of the stoppage to persist for the following vehicles. That is, even though a blockage is removed, the following cars will still have to slow or stop because of the earlier build-up of traffic.

This potential traffic gridlock is surely critical for the whole city and ought to concern those who want to ensure reliable and rapid access to FMC.

More broadly, the SSC Final TIA did not consider several outcomes highly likely in a heavy traffic environment induced by traffic interruptions or blockages in this area. Some examples are:

- pedestrians and cyclists mixing with autos on the SSC site,
- pedestrians (from SSC and nearby apartments) and cyclists using east-west pedestrian crossings at the roundabout and impeding traffic there,
- a car or bus or truck stalling in either the NB or SB lane of Uxbridge, or
- accidents between cars or between a car and people in the single lane of traffic headed into the roundabout (either NB or SB), or
- accidents or vehicle stalls on internal SSC roads or in parking structures.

These types of congestions could potentially slow the delivery of crucial emergency medical and fire suppression services into the UH community, FMC and SSC if these possible traffic outcomes are not addressed before SSC redevelopment occurs. For instance, fire trucks from the North Hill station might find it time consuming or impossible to enter UH or SSC due to traffic gridlock at the roundabout.

6. Traffic Consequences of the Absence of Bus Lay-bys on Uxbridge

The DPA does not provide for a bus lay-by on Uxbridge. With only a single lane of traffic into the roundabout, the absence of a lay-by will significantly impede following South Bound (SB) vehicle traffic when a SB bus stops north of the roundabout. Although WS suggested that a stopped bus would likely entail a delay of only 20 seconds or so for vehicles following the bus, this time estimate seems optimistic when prospective delays are caused by bus passengers entering or exiting using walkers or wheelchairs or strollers or with bicycles, at times in the morning and afternoon when students from the adjacent school enter or exit, or if high-passenger-volume articulated buses ever travel on Uxbridge.

Further, retaining the bus stop for NB buses at its present location on Uxbridge (with no lay-by) will delay traffic NB on Uxbridge to the roundabout. It is worth noting again that, for Uxbridge just north of 16th Ave, the Final TIA projected a 39% increase in both-way traffic which, combined with the elimination of one of the two lanes approaching the roundabout, results in reduced safety for pedestrians and cyclists, increasing delays for transit and emergency vehicles, and degrading access for vehicles to SSC and UH.

At present, the #20 bus travels Uxbridge (north or south) every 10 minutes or so during the afternoon peak demand period, suggesting the frequency with which this particular traffic congestion may occur.

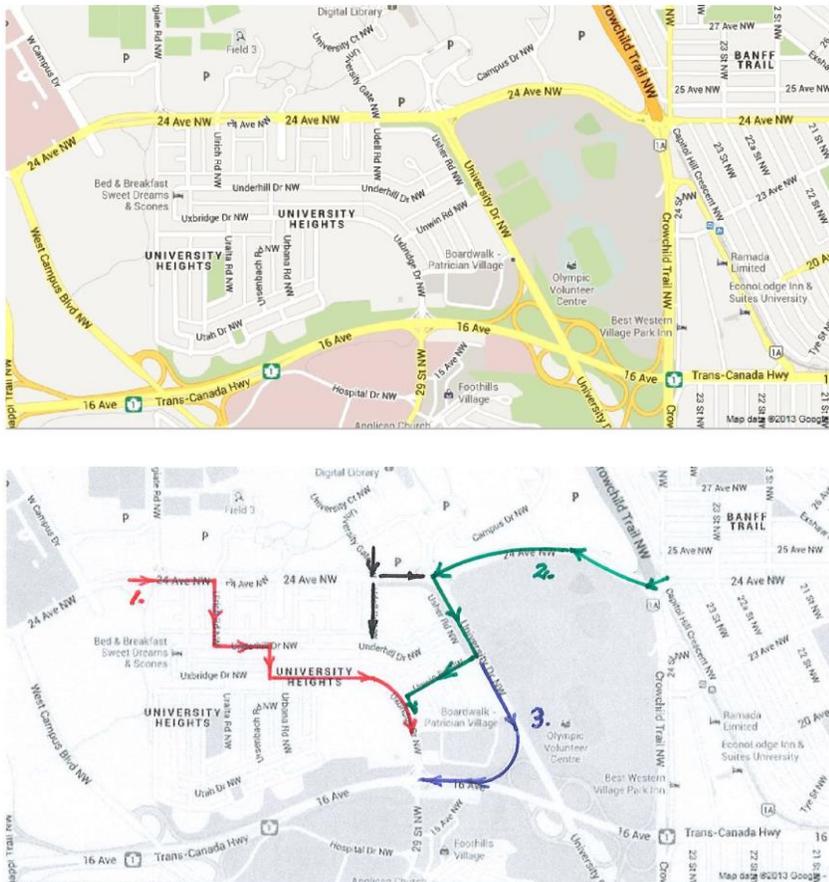
Bus lay-bys on both NB and SB Uxbridge at the SSC site are requested.

7. Shortcut Traffic through University Heights

Much shortcutting traffic already congests roads in UH. The SSC Final TIA only described shortcutting traffic in UH and recommended some possible measures to cope with it. The TIA for West Campus Development (now University District) provided no mention of induced shortcutting in surrounding neighbourhoods. With the West Campus TIA projecting an estimated 75%+ increase (a calculation made by using traffic flows in that TIA) in both way traffic along 24th Ave, it is highly likely that some of that traffic will enter UH as shortcut traffic, particularly to access FMC, unless remedial action is taken. Further, since UHCA has not had access to the Cancer Centre TIA, it is not known whether it contains discussion of additional shortcutting in UH.

The following two diagrams help to explain shortcutting traffic in UH.

University Heights and Surrounding Roads



Among several shortcut routes, two in particular congest UH traffic, especially during peak periods. First (in red), for traffic EB off 24th Ave, the route accessing either FMC or 16th Ave follows 24th Ave east to Ulrich, south to Underhill, east to Ulysses (not named in either image), east on Uxbridge and then to 16th Ave. Second (in green), for SB traffic on Crowchild Trail, accessing either FMC or 16th Ave follows 24th Ave west to University, south to Unwin, west to Uxbridge and then to 16th Ave. These routes are also used in reverse.

Additional shortcutting flows are marked in black. These flows represent traffic exiting the Art Parkade structure at UC. Some exiting traffic proceeds SB via Uxbridge, then turns either east or west on Underhill heading for the 16th

Ave/Uxbridge intersection. Other parkade exiting traffic heads EB on 24th Ave to join shortcutting traffic marked in green or to access Crowchild Trail.

A third route (indicated in blue), is a variant of the second route. SB traffic on Crowchild Trail follows 24th Ave east to University and then turns right off University to 16th Ave through the traffic weave (where the right turn lane off University Drive and the right hand traffic lane of 16th Ave run in parallel). **This route is not a shortcut route since it follows the periphery of UH.** The disadvantage of this route for drivers headed toward FMC is that, after moving into the weave, they must enter 16th Ave and cross two traffic lanes to the left turn lane over a very short distance in order to turn left at 29th St. These lane crossings are risky.

Further, this route only accommodates traffic headed WB on 16th Ave. The advantage of the second route (in green) for drivers is that it allows traffic at the 16th Ave/Uxbridge junction to turn left or right, or proceed SB on 29th Street. SB traffic on 29th St can proceed to FMC, beyond FMC or enter St. Andrews Heights. The hazards of using the traffic weave at the 16th Ave/University intersection may induce shortcut traffic to use the second route through the community.

If shortcutting is even discussed, each development in or around UH (SSC, University District, Cancer Centre) treats shortcutting traffic as a neighbourhood problem to be dealt with using particular measures such as traffic calming. However, taken together, the cumulative effect of shortcutting in UH arising from the three developments and the general growth of traffic in Calgary is likely to have a serious adverse effect upon UH traffic congestion, safety, and transit and emergency vehicle effectiveness.

7.1 Consequences of Increased Traffic Flows on Unwin Road

According to the SSC Final TIA, Unwin Road currently carries about 5500 vehicles per day. It also mentions (p. 45) that Unwin is *already* close to capacity at peak periods according to city standards as “it is already at the upper end of the city’s environmental design thresholds for standards of collector roads”. So how will it accommodate the Final TIA’s projected 56% increase in afternoon peak hour both way traffic flows from 587 to 914 vehicles? One part of the additional traffic due to SSC development will be vehicles NB on Crowchild Trail turning left onto University, then left onto Unwin WB and then directly to the SSC northern entry point. (This route may also be used in reverse.) Thus Unwin east of Uxbridge is likely to be integral for accessing the SSC northern entry point. Part of the existing and future traffic on Unwin is shortcutting traffic (the route in green above). Attempting to calm traffic on Unwin could slow vehicle travel to SSC and further congest traffic in UH.

Early in the process leading to the ARP there was discussion of constructing bike paths on Unwin to facilitate bike travel to UC. Given the existing bike/pedestrian path to UC along University Drive north of Unwin, this suggestion initially seems plausible. However, if bike paths are constructed on Unwin, then traffic there will likely be even more congested than projected. Traffic will be slower and spillovers to nearby streets and intersections worse. There will also be adverse impact upon the congestion of vehicles entering UH using Uxbridge, and drivers may be encouraged to attempt to exit UH by turning right from Uxbridge onto Ulster and then to Unwin and University.

7.2 Parking on Unwin and Elsewhere in UH

With increased traffic on Unwin, will parking still be allowed there after SSC redevelopment? Existing on-street parking (on the north side) is permit parking only and heavily used by residents in this high density portion of the community. Without this parking many residents will be adversely affected.

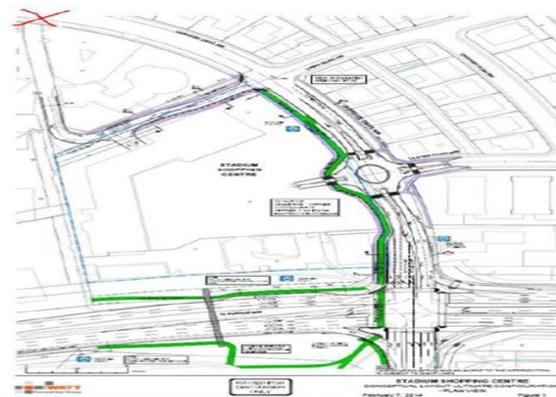
A broader question involves the adequacy of parking at SSC. If there are insufficient parking stalls at SSC, or if they are priced too high, vehicles will cruise in UH to search for curbside parking, congesting UH streets. By itself, the inconvenience of utilizing the SSC parking structure may induce cruising for curbside parking. Already several UH streets are heavily used for parking, and, without future parking restrictions, more curbside parking will be utilized by SSC residents or visitors and by people who visit or work at FMC and the Cancer Centre. Besides the obvious inconvenience to UH residents, autos cruising for parking pose a very real safety issue for pedestrians throughout the community and particularly in the high density residential area opposite SSC.

8. Auto Traffic at the Laneway and the Underhill Junction North of SSC

As of this date, there is no definite answer about vehicular traffic in the laneway between the Catholic church and Westmount Charter School. Lane traffic north to Underhill from SSC will have major implications for the safety of school children and other pedestrians. Indeed, the Westmount Charter School opposes one-way NB traffic in the lane precisely for this reason. Non-emergency NB vehicular traffic using this lane ought to be prohibited.

9. A Possible Pedestrian Crossing at the Laneway and the Underhill Junction North of SSC

The image below depicts the possible location of a pedestrian crossing (with a red X) at the laneway/Uxbridge junction. Such a pedestrian crossing would facilitate pedestrian/bicycle traffic using the north-south connector from Uxbridge to Underhill (not shown in the image). There was no discussion of this possibility in the SSC Final TIA or in the ARP, and the community is unaware of any present plan to construct such a pedestrian crosswalk.



Already much pedestrian traffic across Uxbridge occurs at this location by Charter school students and persons walking to and from UC. Further, following SSC redevelopment the connector from Uxbridge to Underhill is likely to become heavily used by pedestrians/cyclists transiting between UC and SSC. A pedestrian crosswalk at this location is recommended following SSC redevelopment to improve safety for pedestrians/cyclists. However, if constructed, a pedestrian crosswalk will introduce a source of stopped traffic NB on Uxbridge, this time north of Unwin.

10. Expected Performance of the Roundabout at Uxbridge Drive and Ulster Road

Central to the auto flows in and near SSC is the expected performance of the roundabout to be constructed at Uxbridge and Ulster. Problems associated with roundabout performance are discussed next.

10.1 Merging of Traffic Flows North onto Uxbridge Drive

UH residents have previously raised questions/concerns about merging traffic flows entering UH on Uxbridge. One example is UHCA's question 8 and the WS answer in a WS PDF titled "February 25, 2014 Community Association Meeting: Questions & Answers" following a WS/City meeting with residents of UH and St. Andrews Heights:

8. Can you explain how the two north bound lanes on Uxbridge that merge into one lane have sufficient peak stacking capacity to handle the two east bound left turns from 16th as well as the west bound right turn, simultaneously taking into account traffic exiting Tim Horton's and the Shell station?

The analysis conducted as part of the TIA has reviewed the anticipated queue lengths along this approach and the analysis suggested the queues will extend back to about the north access to the Shell station during the peak periods.

Because the particular nature of SSC development (size and placement of buildings, placement of parking structures and surface parking, number of parking stalls, configuration of internal pathways and roads, the number of people living and working at SSC), and the precise location of the Cancer Centre were not known when the analysis described in the answer was conducted, the Final TIA analysis could not reliably have accounted for the likely interactions among pedestrians, cyclists and vehicles at the redeveloped SSC as described in the WS answer to question 8. As a result, the TIA may well be deficient in projecting outcomes of traffic flows along Uxbridge (expected to be 39% higher close to Unwin or close to 16th Ave, as argued above), particularly when highly likely traffic stoppages occur and gridlock may result.

It is worth noting that, for numerous questions previously posed to WS during the time frame leading up to the DPA, a frequent response from WS was that, because the exact internal configuration of the site was not known, no answer could be provided to the particular questions raised. If so, how could the Final TIA have reliably addressed the UHCA question 8? The lack of detailed information on SSC redevelopment (available now in the DPA) as inputs to the Final TIA conducted nearly three years ago means that road design has been developed with poorly supported traffic projections. The consequences of making the wrong traffic decisions will have significant impacts on the community and all developments occurring in this area.

10.2 The Potential of the Traffic Weave to Create Traffic Congestion on Uxbridge to WB 16th Ave

The traffic weave is depicted in the image below by dashed red and blue lines along 16th Ave. Much WB traffic presently entering UH from 16th Ave turns right off 16th Ave into the weave and from there into UH. Also depicted, in red, are the single traffic flow turning right from the weave into Uxbridge and the two possible flows exiting Tim Horton's/Shell station. Much traffic turning from University Drive into the weave seeks to proceed west on 16th Ave, or to the FMC and to do so must move left into the centre or left traffic lane on 16th Ave.



The SSC Final TIA contained brief discussion of the traffic weave (using observations only during the p.m. peak period on a single day, April 3, 2013) and concluded that SSC redevelopment would create no problems for weaving traffic. However, no discussion was devoted to what would happen to traffic in the weave in the event of a traffic blockage on the SSC site or nearby that halted traffic on Uxbridge. If WB traffic on 16th Ave intending to turn right on Uxbridge cannot enter the weave because of a blockage, most likely it will remain in the right traffic lane of 16th Ave to wait for possible entry to the right turn lane, halting all following traffic and congesting traffic on 16th Ave east of Uxbridge. The longer it takes to remove the blockage halting traffic on Uxbridge, quite likely the longer the queue of vehicles on 16th Ave. And the longer the queue of vehicles in the right lane of 16th Ave, the more likely it is that drivers in that queue will try to merge into the lane to the left, creating safety problems. Further, if traffic in the weave cannot move left onto 16th Ave because all traffic in the traffic lane to the left is stopped, a queue of vehicles will build in the right turn lane off University Drive, potentially halting traffic in the SB right traffic lane of University Drive. Finally, the traffic blockage will delay entry to UH via Uxbridge.

10.3 Statements of Confidence about Roundabout Performance by WS

How might the roundabout perform in coping with vehicular traffic flows? In the above-referenced WS PDF, when answering UHCA questions 11 and 12 (not repeated here), WS refers to this roundabout:

The roundabout is being designed with one circulating lane. Roundabouts can carry a significant amount of traffic but their performance is highly dependent on the specific traffic flow projects on each approach and the directional distribution of that traffic. The analysis conducted as part of the TIA indicates that the roundabout will perform quite well during the peak periods.

The analysis of the roundabouts included significant pedestrian and cyclist volumes on each approach. Although the pedestrian and cyclist crossing may cause temporary delays to motorists, the overall performance of the roundabout is expected to be satisfactory.

No specific data/studies/examples were offered to support these statements of confidence, and no reference was made to traffic outcomes that were generated over a range of possible traffic congestions at the roundabout.

10.4 Doubts about Roundabout Performance

Residents are concerned that the roundabout performance "is highly dependent on the specific traffic flow projects on each approach and the directional distribution of that traffic." Has the expected performance of the roundabout taken into account the likely stopped-traffic circumstances discussed above? Did the analysis account for the vulnerability of heavy-flow traffic near and at the roundabout to interruptions on-site and in the parking structures stemming from pedestrian-bicycle-auto interactions such as those specified above? Because there was no reference to stopped traffic in the TIA, it is not known whether any such analysis was conducted, despite the statements of confidence from WS. As a result, residents have very serious doubts about the expected performance of the roundabout, especially during the afternoon peak travel period and because of its proximity to the busy retail outlets of Tim Horton's and the Shell station.

10.5 Does the Roundabout Design and Reconstructed Uxbridge Drive Lead to Possible Traffic Problems?

The funnelling of three to five NB traffic streams into a single traffic lane on Uxbridge and a single lane at the roundabout guarantees that several traffic streams entering Uxbridge can come to a complete halt for highly plausible reasons. The absence of an adjacent traffic lane at the roundabout to bypass stopped cars means that there will be no possibility to pass vehicles stopped at or near the roundabout, or to exit onto Ulster. Alternatively, impatient drivers may create a safety hazard by attempting to pass a vehicle stopped at the roundabout. To avoid the traffic signal at Uxbridge/Unwin, drivers might turn right at the roundabout onto Ulster Road and subsequently turn right at Unwin/Ulster, raising safety issues in the heavily populated residential area east of Uxbridge.

Stoppage may also persist if, for example, an accident occurs or a car stalls inside SSC, or at or near the roundabout, and clearing the accident/stall takes time. This delay will worsen if traffic continues to be stationary or nearly so after the blockage is removed, as discussed above.

The absence of a bus lay-by adjacent to each single traffic lane leading to the roundabout also worsens the potential traffic congestion caused by a stopped bus -- including traffic stoppages -- either NB or SB on Uxbridge.

The potential adverse consequences for traffic buildup at the roundabout and at the Uxbridge intersections with Unwin and 16th Ave are clear, and the community is concerned that the roundabout will not work effectively. Indeed, it is plausible to conclude that the design of the roundabout and the reconstructed Uxbridge Drive will likely lead to traffic congestion (up to gridlock) that will accompany SSC redevelopment. These vulnerabilities of the design of the roundabout and reconstructed Uxbridge to stopped auto traffic have not been discussed in the Final TIA or at the workshops. The vulnerabilities call into serious question the design of the roundabout and Uxbridge Drive between 16th Ave and Unwin.

10.6 Reference to Possible Queuing Problems in the SSC ARP

Policy 3 of section 5.5.4 of the ARP (page 22) addresses the possibility of queuing vehicles on the SSC site interfering with traffic on Uxbridge:

- 3 The design of the internal street network should provide distances between Uxbridge Drive NW and subsequent internal intersections that are adequate to prevent queuing vehicles from extending into Uxbridge Drive NW.**

What steps were taken in preparing the DPA to implement this policy? How long must the “distances” be to eliminate the queuing mentioned in the ARP? What testing was conducted over a range of possible traffic congestions on site, and in different locations on site, to verify that the design of the internal street network satisfied this policy? The community would like to know the results of such tests, if they were conducted, and if they were not, to request that they be conducted and the results communicated to the community. As argued above, many traffic circumstances can lead to queuing, potentially serious queuing when traffic is halted, and the community requests that the potential adverse effects of queuing be addressed.

11. Comments on the Micro-simulation of Traffic Flows Prepared and Presented by WS

During the third Master Planning workshop (held April 15, 2014), WS presented a micro-simulation of traffic flows into the site and along 16th Ave, Uxbridge and Unwin during the afternoon peak travel period. At that time, WS disclosed no specific information about the SSC development. Apparently, the simulation did not incorporate specific assumptions about the location and lengths of internal roads and paths, “the shared zone”, the number of parking stalls and their surface or underground location, the placement of buildings and sizes or number of residents/jobs created. Hence the simulation was conducted largely in a vacuum regarding actual site composition, raising doubts about the validity of the simulation results determined. If the simulation did make specific assumptions about these elements, those assumptions were not communicated to UHCA and hence UHCA could not properly evaluate the simulation. There was no attempt to show how the micro-simulation changed with changes to any of the specific elements mentioned above.

The simulation was conducted *assuming that 16th Ave had been widened to 6 lanes* and that all of the initial base-case assumptions of the TIA were adopted. Yet the ARP approved by City Council included the sensitivity analysis case of a 20% increase in land uses, not the base case land use totals in the SSC Final TIA. As a result, the higher traffic generated by the 20% land use increases was *not* simulated (despite UHCA asking that it be simulated). Also, the "judgement calls" of Appendix G of the TIA, which involved substantial peak-demand movements of SB traffic from 16th Ave onto 29th Street and then to FMC, being redirected to the 16th Ave flyover to FMC formed part of the simulation. UHCA also asked that these "judgement calls" not be made part of a simulation but this request was also ignored.

Several other comments raised by UHCA were ignored. The much slower speed of autos traversing the site during the afternoon peak period and travelling through the parking structures, relative to the speed of autos on Uxbridge, most likely will have adverse implications for NB traffic on Uxbridge entering UH from 16th Ave and 29th St. This behaviour was not captured in the simulation. Also, the assumed rapid entry of vehicles onto Uxbridge using the weave on 16th Ave was inappropriate. For right hand turns off 16th Ave, vehicles entering UH from the right-hand turn lane must slow to check for vehicles entering Uxbridge from EB 16th Ave and NB 29 St to avoid collisions. (All vehicles turning into UH from the weave do this currently.) This decelerating traffic slows all following vehicles in the weave, delaying WB traffic in the right through lane on 16th Ave and autos entering 16th Ave off University Drive. In heavy traffic, these delays will congest the 16th Ave/Uxbridge junction.

The computer simulation did not capture these conditions. Hence the WS micro-simulation could not be accepted as a valid visual depiction of traffic flows around a redeveloped SSC during the afternoon peak travel period. An analysis/simulation of more realistic traffic flows utilizing improved inputs, from all of the proposed developments, is requested. UHCA would appreciate an opportunity to comment on the inputs/parameters of such an analysis.

12. Summary of Concerns

Close examination of the proposed large SSC redevelopment, both during the construction phases and after completion, suggests that serious traffic congestion problems will accompany the development, potentially involving traffic gridlock at certain times. Even today there are serious congestion problems at this site at peak periods, let alone what may be expected with a 39% increase in peak traffic flows on Uxbridge and 56% on Unwin. What has not been discussed in detail, but also of much concern to many residents, is the adequacy of parking at SSC. Insufficient or costly parking will induce cruising for curbside parking in the UH area by SSC residents or visitors, promoting a safety hazard and congesting UH streets still further. UH residents will experience the overall congestion, especially during peak travel periods, as will all vehicles driving through the community. Similarly, congestion could be experienced by drivers in both directions on 16th Ave approaching Uxbridge.

Traffic issues identified in this document need to be addressed before SSC redevelopment is approved, particularly those with adverse implications for the 16th Ave/Uxbridge intersection. Further, important safety issues for pedestrians (especially children and UC students) and cyclists have been identified as well, and these need to be resolved before project approval.

As part of scrutinizing these adverse effects to safety and traffic congestion, a traffic study of all simultaneous large developments (SSC, Cancer Centre, University District) and the projected enrolment growth at UC of potentially upwards of 10,000 students (plus additional faculty and support staff) should be undertaken. This study ought to include nearby prospective developments over the next decade as well, such as development near the North Hill

Sears outlet (adding to 16th Ave traffic) and a prospective Field House and other athletic facilities close to UH, since these prospective developments will increase nearby traffic volumes and influence the findings of traffic analyses.

The problems of shortcutting traffic from all these developments are bound to affect UH and shortcutting should be included in such a study. The TIA for the Cancer Centre is not yet available to the community and hence any reference to shortcutting is unknown, the TIA for West Campus did not mention shortcutting at all, and the Final TIA for SSC treated shortcutting traffic as a neighbourhood problem to be treated by traffic calming. This suggested treatment may not be effective, with one particular example being shortcutting traffic using the Uxbridge-Unwin route. This stretch of road constitutes the principal access to UH and SSC and to the SSC northern entry point if traffic to SSC turns into UH from University Drive. Traffic calming along Uxbridge-Unwin could delay traffic for the SSC site and UH, and delay or possibly snarl traffic at the 16th Ave/Uxbridge intersection.

A key focus in such a study ought to be on the effectiveness of the roundabout for managing the flows of traffic in and around UH. Weaknesses of the roundabout need to be identified, possible mitigation strategies identified and particular mitigations implemented before the project is approved.

The community concerns expressed here are serious. Aside from heavy traffic congestion (which already exists at peak hours due to local school traffic and shift change at the hospitals) up to gridlock level, the risks of accidents from interactions with vehicles include death or serious injury for pedestrians/cyclists. Further, heavy congestion which slows arrival of emergency vehicles into UH and SSC, or ambulances or fire trucks to FMC, is also a concern.

If the concerns are not addressed before project development, the adverse consequences will be seen following development. At that time mitigation strategies may prove much more costly or impossible to implement.

Appendix: Notes on the Backgrounds of the Authors

John Rowse is Professor Emeritus of Economics at the University of Calgary (UC). Prior to retirement, he taught courses in mathematical economics and computational optimization, and conducted research using these methods. A recent coauthored publication is: Arnott, Richard and John Rowse, "Curbside Parking Time Limits," Transportation Research, Part A: Policy and Practice, Volume 55A, September 2013, pp. 89-110.

Wayne Davies is Professor Emeritus of Geography at UC. Prior to retirement, he taught courses mainly in urban geography and urban studies. He has published over 120 papers/chapters and authored or edited 11 books, in addition to consulting for the Province of Alberta and the City of Calgary. His most recent book is: Theme Cities: Solutions for Urban Problems, GeoJournal Library 112, Springer Science and Business, 2015, 615 pp.

Robert Dewar is Professor Emeritus of Psychology at UC and is President of his own consulting firm, Western Ergonomics, Inc., specializing in driver behaviour and traffic safety. He has co-authored three books on this topic and previously conducted a review for the City of Calgary on pedestrian accidents.

Pat Muir is a clinical audiologist who worked with clients of all ages in health, educational, and research settings for over 25 years. More recently, she obtained a PhD with a focus on pediatric clinical research in auditory neuroscience. She has volunteered on several projects with provincial and national professional organizations.