# MEMO

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| TO: | David Shelsted, MBA, P.Eng.<br>Director of Roads, City of Greater Sudbury |
| FROM: | Brent Hooton |
| CC: | Mike Walters, P.Eng. |
| DATE: | February 23, 2018 |
| SUBJECT: | Kingsway Sports and Entertainment Complex<br>Exit Times vs. Processing Times Following Arena Events |
| OUR FILE: | 17-6373 |

This memo has been prepared as a supplement to the December 2017 traffic impact study (TIS), and provides additional information on the time required to serve vehicle movements, and the time required to exit the site, following an event at the proposed arena.

## 1.0 Post-Game Processing Time vs. Delays to Individual Travelers

The TIS identified that it would take approximately 55 to 65 minutes to process all outbound traffic destined to the west (assuming no diversion of west-oriented traffic to the eastbound Kingsway and the Highway 17 bypass). This time refers to the total amount of time that would be required to clear all vehicles from the site. The calculations are based on a sold-out event (5,800 spectators), a worst-case condition when recognizing that the majority of events at the arena would not be fully sold out. As noted in the TIS:

- Current Wolves attendance is typically in the range of 3,000 to 4,000 spectators, and most other OHL teams typically draw similar attendance levels; and
- Most teams draw 5 to 10 near-capacity crowds per season, but attendance at the majority of games is usually 85% of capacity or less.

In addition, the 2017 arena feasibility and business case study prepared by PricewaterhouseCoopers identified a potential average attendance of 4,350 spectators per game, equivalent to 75% of the arena capacity. This is a further indication that a sold-out event would be an infrequent, worst-case condition.

The time to process all vehicles is different from the traffic delays experienced by individual users when exiting the site. The total time that would elapse between leaving one's seat in the arena and turning from Street "A" or "C" onto the Kingsway will be highly variable, and dependent on a number of factors:

- The time required to exit the building;
- The time required to walk to one's vehicle;
- The time required to manoeuvre through the parking lot and turn onto the public street network; and
- The time required to travel along Streets "A" and "C" to access the Kingsway (including time spent in a queue of traffic).

Each of the above factors can be variable, as described below.

- *Time to exit the building*

  Some spectators may choose to leave before the conclusion of the event to "beat the crowd".

  At the end of the event, spectators will line up to access the aisles leading to the concourse. The time to get to the concourse will vary depending on proximity of one's seat to the aisle, and the proximity of one's row to the top of the aisle. This could vary anywhere up to approximately 5 minutes for an aisle serving 300 seats (based on an approximate discharge rate of 2 spectators every 2 seconds).

  Once on the concourse, some spectators will choose to exit the building as soon as possible, while others may linger to socialize or to use washrooms or other facilities.

  The time to exit the building from the concourse will vary depending on the distance from the aisle to the building exit.

  Spectators may also remain on-site to visit the casino or to attend other post-event programming within the district, which would reduce the magnitude of the surge in activity following an event, dispersing pedestrian and traffic activity across the peak hour so that not all spectators are attempting to leave the site at the same time.

- *Time to walk to the parking lot*

  The time to walk from the arena to one's vehicle will vary substantially due to the size of the parking lots proposed. As an example, at a walking speed of 1.2 m/s, it would take approximately 4 minutes to walk from the Festival Square entrance to the more distant spaces near the Street "A" and Street "C" intersection, and longer to reach spaces in the overflow parking areas north of Street "A".

- *Time to exit the parking lot*

  The time to exit the parking lot and turn onto Street "A" or Street "C" will vary depending on the proximity of the parking space to the closest exit (or the preferred exit), including delays due to friction from pedestrian and vehicle movements within the parking lot, and time spent waiting in queues to enter the main site driveways or to turn onto the public road network.

- *Time to travel along Streets "A"/"C"*

  The time to travel along Street "A" and/or Street "C" between the site egress and the Kingsway will depend on which access is selected (i.e., how far the access is from the Kingsway), as well as how early (or how late) the motorist is traveling.

## 2.0 Post-Game Travel Delays to Buses and Transit Riders

The site plan includes a pick-up and drop-off loop adjacent to the main Festival Square entrance. On event days, the loop will be closed to general traffic and will be used by buses only. A traffic signal is proposed at the loop exit, both to accommodate pedestrians crossing to overflow lots on the north side, and to allow buses to turn onto Street "A". The location of the bus loop has been identified to maximize proximity to the arena entrance for bus riders, but because it is the closest primary site access to the Kingsway it also prioritizes bus egress by allowing buses to jump the queue.

The travel time for a bus to leave the site and turn onto the Kingsway is estimated to be approximately 5 minutes:

- Once a bus departs the Festival Square loop and arrives at Street "A", the signalized exit will create a gap in traffic to allow the bus to make a left turn onto Street "A". There may be a short wait for the signal to turn green. The signal should be actuated, with parameters that are as responsive to bus arrivals as possible during the post-event period.
- There is a distance of approximately 360 metres between the bus loop exit and the Kingsway. In the worst case, where the bus is joining a continuous queue of traffic, there would be 48 vehicles in front of the bus.
- There are no other major accesses between the bus loop and the Kingsway, so there would be no other opportunities for event traffic to join the queue in front of the bus. (There is a driveway serving the casino; however, the volume of traffic exiting from this driveway would be relatively low if the casino parking lot is reserved for casino users only on event days.)
- The traffic signals at Street "A" and the Kingsway have been calculated to accommodate an average of 15.1 vehicles per minute turning right from Street "A" during the post-game peak hour.[1]
- It will take approximately 3 to 4 minutes to process all 48 vehicles in front of the bus, at which point the bus will be at the front of the queue, ready to turn onto the Kingsway.

## 3.0 Post-Game Travel Delays to Motorists

The analyses found that it would take 55 minutes to serve all post-event traffic (805 vehicles) making a right turn from Street "C" onto the Kingsway. In a hypothetical (and implausible) worst-case situation where all of this traffic arrives at the exact same moment, the last vehicle in the queue would wait 55 minutes, and the average (median) vehicle would wait 27.5 minutes.

However, because of all the other factors that affect when spectators arrive at their cars after an event and how long spectators choose to remain on-site following an event, not everyone will be forming a queue on the road at once.

- The lower bound would be someone seated next to the aisle, in the top row closest to the concourse, in the section closest to the exit, leaving immediately at the end of the event, and

[1] Based on the following parameters:

- Peak 15-minute flow rate = 953 vph
- Peak 15-minute v/c ratio = 1.05
- Peak 15-minute capacity = 908 vph, or 15.1 vehicles per minute

parked as close as possible to the exit. That person would be in their vehicle within one to two minutes depending on the internal configuration of the arena concourse (e.g., one minute to exit the building; one minute to walk to the closest parking spaces).

- An upper bound would be someone seated in the middle seat of the bottom row farthest from the concourse, in a section on the south side of the rink, parked in the overflow parking area on the north side of Street "A", and waiting in line to use the washroom before walking to their car. That person might not arrive at their vehicle until 15 or 20 minutes after the end of an event.
- A further upper bound could be defined by spectators that remain on-site after an event to participate in post-event programming or to visit the casino. The length of time remaining on-site would depend on the nature of programming.

This difference means that traffic movements will be more dispersed than the hypothetical worst-case condition, and the maximum and average delays would be lower.

Similar to the conditions for transit riders, the travel time on Street "A" to get to the Kingsway after passing the bus loop exit would be approximately 3 to 4 minutes. Using the same methodology, the travel time on Street "C" between the southernmost site access and the Kingsway would be approximately 1 to 2 minutes.

## 4.0 Summary

The December 2017 TIS identified that it would take 55 to 65 minutes to process all post-event traffic destined to the west (assuming a sold-out event as a worst case, and assuming no diversion to alternate routes). This is different from the actual amount of delay experienced by individual travelers.

For bus riders, it would take approximately 5 minutes between departure from Festival Square to the time when the bus turns onto the Kingsway, assuming as a worst case that the bus is behind a continuous queue of traffic when it turns onto Street "A". Measures will be in place to prioritize bus movements (pick-up / drop-off loop reserved for buses on event days; traffic signal at the exit from the bus loop onto Street "A").

For motorists, the delay will be highly variable dependent on a number of factors including time to exit the arena and time to walk to one's vehicle. In a hypothetical (and implausible) worst-case condition where all drivers try to depart at nearly exactly the same time, the last driver to join the right turn lane queue would have a delay of close to 55 to 65 minutes, but the average (median) delay would be 27.5 to 32.5 minutes, and half of vehicles would have delays less than that. In practice, the departure times will be more spread out, potentially over a 20-minute period (and possibly longer, depending on the nature of post-event programming held within the entertainment district), further decreasing the maximum and average delay times.