17 Avenue SE Stampede Crossing (17SX): Anticipated impacts to Roads and Calgary Transit Operations

Impacts to Transit

Due to the revised track geometry, train speeds will need to be reduced which will increase train run time by approximately 15-seconds in both directions. Additional delay could result from the intermittent interruptions associated with a new at-grade crossing (e.g. waiting for the crossing to clear, verifying the intent of a pedestrian). These could combine to result in the need for an additional key (one more CTrain) to maintain the same schedule within the constraints of the collective agreement.

Victoria Park / Stampede station will be reconstructed as an at-grade station with two side loading platforms. C-Track platform will be permanently removed and not replaced. This is necessary to create sufficient space for pedestrian refuge areas between the two MacLeod Trail pedestrian crossings and the two LRT track crossings [Figure 1]. The siding will be relocated over the Elbow River. It is assumed that peace officers or City of Calgary personnel will be required to ensure users are adhering to the warning signals at the LRT track crossings during major events in Stampede Park. Once implemented, these LRT track crossings will become the busiest on the LRT system.

Conflict points

An at-grade crossing of 17 Avenue into the Stampede Grounds increases the number of conflict points between pedestrians, vehicles and light-rail vehicles. Conflict points were assessed as part of the Risk Based Preliminary Design Report and can be mitigated – but not eliminated – through appropriate design and safety measures. Appropriate measures include the use of automatic crossing gates, lights and bells and designing the at grade crossing so that it is accessible to all pedestrians regardless of physical ability. The detailed design of the LRT at-grade crossing will be reviewed by the Crossing Committee Working Group and the Access Design Subcommittee.

Traffic lane configuration

During the initial planning stages, a discussion between CMLC, Calgary Stampede and The City took place that looked at the operational requirements, equipment and challenges with operating a lane reversal system that crosses an at-grade LRT crossing. The operational requirements for a lane reversal include the need for a transition zone where traffic can shift to / from the reversal lanes and left turn restrictions. The requirement for a transition zone extends the limits and impacts of the project at least one block upstream and downstream of the crossing on 17 Avenue. The equipment needed for a lane reversal system includes 2 overhead lane control gantries per block interconnected with a traffic signal controller. The challenges with a lane reversal crossing LRT tracks protected by automatic crossing gates, lights and bells include times when automatic gates will not be the proper length to block traffic from crossing the LRT tracks. Through discussions during the planning stages of the Risk Based Preliminary Design Report, CMLC agreed that a lane reversal system will not be installed to control vehicular traffic entering or exiting the Stampede Grounds. The agreement also included the configuration of the lanes entering the Stampede Grounds will be 2 eastbound lanes and one

westbound lane with a provision to expand to a second westbound lane at some point in the future if needed.

Microsimulation modelling parameters

A VISSIM and VISWALK model was developed to determine the impacts to Roads and Calgary Transit operations that would be anticipated resulting from an at grade LRT crossing for pedestrians and vehicles at 17 Avenue, connecting into the Stampede Grounds. The model parameters included existing and future traffic volumes as well as existing surge pedestrian volumes observed after a Flames game.

The traffic operations modelled included the pre-emption of a signalized 4-leg intersection at 17 Avenue and Macleod Trail South by the LRT as it approaches the intersection. The model was also used to inform the size of pedestrian storage area that is needed to accommodate surges in pedestrian volume when events conclude in the Stampede Grounds [Figure 1].

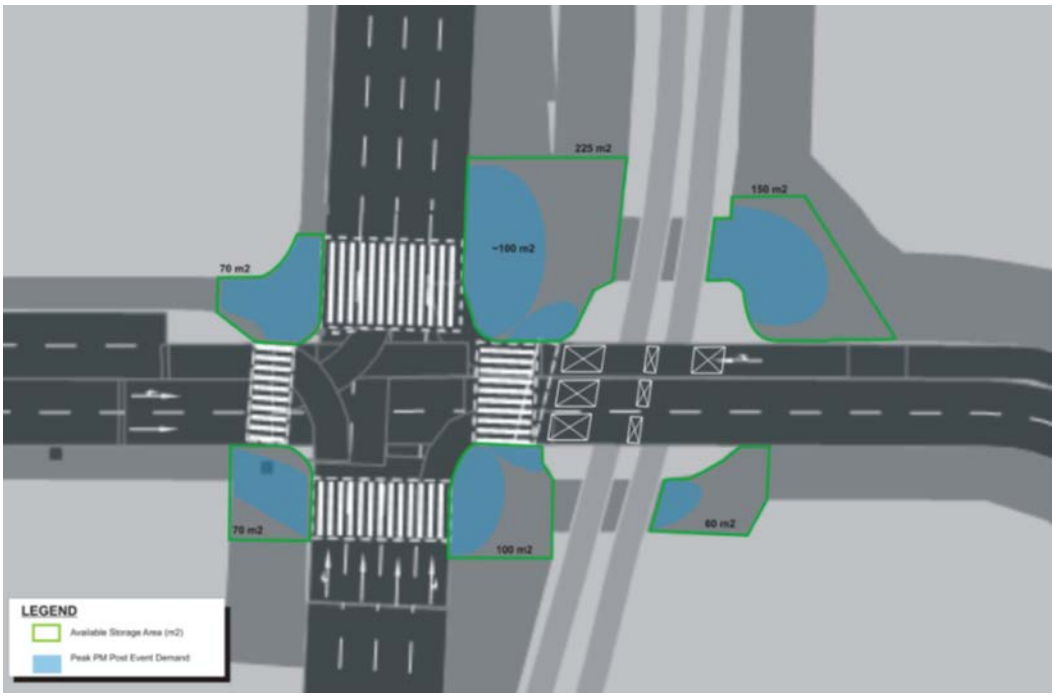

Figure 1: Pedestrian Storage Area Dimensions

Modelling results

The results from the model show that there will be noticeable impacts to traffic on Macleod Trail and 17 Avenue due to the at-grade crossing of 17 Avenue into the Stampede Grounds. Modelling shows:

- Increased queue length on northbound Macleod Trail during the AM Peak hour from 124m to 375m;
- Increased queue length on northbound Macleod Trail during the PM Peak hour with queues similar to future AM operations at 393m (existing PM Peak queues are 111m);

Queue lengths on northbound Macleod Trail of 375m during the AM Peak hour and 393m during the PM peak hour places the back of queue on the northbound Macleod Trail bridge over the Elbow River.

- Increased queue length on eastbound 17 Avenue during the AM Peak Hour from 15m to 146m;
- Increased queue length on eastbound 17 Avenue during the PM Peak Hour with queues similar to future AM operations at 148m (existing PM Peak queues are 20m);

Queue lengths on eastbound 17 Avenue of 146m during the AM Peak hour and 148m in the PM Peak hour place the back of queue next to the entrance to the Elbow River Casino located at the corner of 17 Avenue and 1 Street (Southbound Macleod Trail) SE.

Pedestrian delay at the intersection is anticipated to be highly variable at this location, with delays between 23 and 67 seconds during the AM Peak hour and delays between 58 and 78 seconds during the PM Peak Hour. At times, pedestrian delays may be higher than the numbers outlined in the preceding sentence. Pedestrian delays are highly variable due to frequent pre-emption of the traffic signal by the LRT. At other intersections where there is a highly variable pedestrian delay due to LRT operations, operational experience and observations have shown that pedestrian compliance at traffic signals decreases as delay increases resulting in safety concerns from users.

Conclusion

By proceeding with this project, the Transportation Department is acknowledging and accepting the impacts as outlined above. In addition, an increase in the number of concerns from Calgarians should be expected. Concerns should be expected through multiple channels including 311, social media, traditional media outlets and from Members of Council. As the project moves into future phases, Roads and Calgary Transit must remain actively involved to ensure that the crossing and the 17 Avenue extension into the Stampede Grounds is designed and constructed to meet safety, accessibility and operational requirements for all users in the area. Users in the area include the LRT, busses, vehicles, goods movement and pedestrians traveling along 17 Avenue and northbound Macleod Trail as well as traveling into and out of the Stampede Grounds.

Operational requirements include an agreement between The Stampede and The City outlining an understanding of when the 17 Avenue road crossing will be open to users and when it will be closed to users as well as how traffic control (including physical barriers) will be implemented to accommodate the closures.

There will be additional impacts to Roads, Calgary Transit and the public during the construction phase, including: lane closures, sidewalk closures, LRT station closures, LRT disruptions and alternate bus service requirements.