

Chief Mistawasis Bridge Traffic Impact Assessment – May 2020 Update

ISSUE

This report provides a feasibility analysis from an engineering perspective of raising the speed limit on McOrmond Drive between Wanuskewin Road and Fedoruk Drive, and on Central Avenue between Fedoruk Drive and McOrmond Drive.

BACKGROUND

City Council, at its Regular Business meeting held on May 21, 2013, considered the North Commuter Parkway Project Functional Plan and resolved:

“That the functional plan for the North Commuter Parkway Project, as outlined in the report of the General Manager, Infrastructure Services Department dated April 29, 2013, be approved.

The functional plan report included the following information regarding design criteria.

Street	Limits	Desired Posted Speed (km/h)	Design Speed (km/h)
North Commuter Parkway	West of Central Avenue	70	80
	East of Central Avenue	50	60
Central Avenue	North of Fedoruk Drive	50 / 60 ¹	60

Note 1 in the table above references the following recommendation from the functional plan report:

“All arterial roads should initially have a posted speed limit of 60 km/h, and as development proceeds along the roads, the posted speed limit should be reduced to 50 km/h. Through the Northeast Swale, the posted speed limit should remain at 50 km/h.”

City Council, at its Regular Business meeting held on October 7, 2013, considered the University Heights Sector Plan Amendment and resolved:

“That the revised University Heights Sector Plan Amendment, 2013, and the revised Northeast Swale Development Guidelines, 2012, be approved”

The guidelines note that the posted maximum speed limit should be 50 km/h to reduce wildlife interactions.

The Standing Policy Committee on Transportation, at its meeting held on June 13, 2016, considered the Functional Plan – McOrmond Drive through Aspen Ridge Neighbourhood and resolved:

“That the report of the General Manager, Transportation & Utilities Department dated June 13, 2016 be received as information.”

The functional plan details included for McOrmond Drive between Fedoruk Drive and Kenaschuk Crescent a desired posted speed of 50 km/h, and a design speed of 60 km/h.

City Council, at its Regular Business meeting held on November 18, 2019, considered the Chief Mistawasis Bridge Traffic Impact Assessment and resolved:

- “1. That the Administration provide a report with an analysis from an engineering perspective on the feasibility of raising the speed limit on McOrmond Drive between Wanuskewin Road and Fedoruk Drive and on Central Avenue between Fedoruk Drive and McOrmond Drive. If available please include data on traffic infractions and wildlife deaths, with a comparison to other roads surrounding the city; and
2. That the Northeast Swale Working Group be included in the consultation.”

CURRENT STATUS

The planned and current posted speed limits, and the design speed for different sections of McOrmond Drive and Central Avenue are listed below, and are also illustrated in Appendix 1.

Street	Section	Posted Speed Limit (km/h)		Design Speed (km/h)
		Planned	Current	
Central Avenue	McOrmond Drive to Agra Road	50 / 60	60	60
Central Avenue	Agra Road to south of Fedoruk Drive	50	50	60
McOrmond Drive	Fedoruk Drive to Northeast Swale	50	50	60
McOrmond Drive	Northeast Swale	50	50	60
McOrmond Drive	Northeast Swale to Central Avenue	60	60	60
McOrmond Drive	Central Avenue to Wanuskewin Road	70	70	80

Two travel time surveys were completed in November 2019 for these roads at current posted speeds. The average, minimum, and maximum travel times for approximately 100 trips on each route are summarized in the following table.

Streets	From	To	Travel Time (min:sec)		
			Average	Minimum	Maximum
McOrmond Drive & Central Avenue	Wanuskewin Road & Marquis Drive	Central Avenue & Fedoruk Drive	5:04	4:01	6:17
Central Avenue & McOrmond Drive	Central Avenue & Fedoruk Drive	Wanuskewin Road & Marquis Drive	5:34	4:15	6:37
McOrmond Drive	Wanuskewin Road & Marquis Drive	McOrmond Drive & Fedoruk Drive	6:17	4:11	7:37
McOrmond Drive	McOrmond Drive & Fedoruk Drive	Wanuskewin Road & Marquis Drive	6:44	5:16	8:06

Minimum and maximum travel times differ due to vehicles travelling at different speeds and the impact of signalized intersections along the route.

Over the period of January 1, 2019 to November 27, 2019, Saskatoon Police Service reported:

- 492 tickets were issued on McOrmond Drive between Wanuskewin Road and Fedoruk Drive, predominately for speeding; and
- 254 tickets were issued on Central Avenue between McOrmond Drive and Fedoruk Drive, also predominately for speeding.

Total wildlife deaths for these streets over the period from October 1, 2018 to October 31, 2019 was 20 collisions (14 of those were deer). The frequency collision rates are summarized below.

Street Segment	Posted Speed (km/h)	Length (km)	Vehicles Per Day	Number of Collisions Reported	Frequency (collisions /Trip/km)
Central Avenue – from McOrmond Drive to Agra Road	60	2.31	4,000	5	0.00054
Central Avenue – from Agra Road to South of Fedoruk	50	0.90	Not available	2	Not available
McOrmond Drive – through Northeast Swale	50	0.82	4,865	0	0
McOrmond Drive – Northeast Swale to Central Avenue	60	2.10	4,865	2	0.00020
McOrmond Drive – Central Avenue to Chief Mistawasis Bridge	70	2.47	9,900	11	0.00045

Saskatchewan Government Insurance (SGI) supplied the following summary of wildlife-related collisions in 2018 on the highways around Saskatoon. SGI has a collision reporting threshold of \$5,000 in damages so it is assumed that there are more wildlife collisions that do not cause sufficient vehicle damage that result in a report to SGI.

Highway	Posted Speed (km/h)	Length (km)	Average Annual Daily Traffic (AADT)	Number of Collisions Reported (number of people injured)	Frequency (collisions /Trip/km)
11 (south) – from Saskatoon to Dundurn Access	110	32.4	11,409	102 (8)	0.00028
16 (east) – from Saskatoon to Jct Highway 2	110	28.2	9,589	18 (0)	0.00007
5 – from Saskatoon to start of divided	100	9.9	4,415	8 (0)	0.00018
41 – from Jct Highway 5 to Jct Highway 27	100	30.0	3,913	14 (0)	0.00012
11 (north) – from Saskatoon to Warman Access	110	18.2	22,064	11 (0)	0.00003
12 – from Saskatoon to end of divided	110	11.3	11,640	34 (0)	0.00026

16 (west) – from Saskatoon to Borden Bridge	110	41.4	9,908	47 (2)	0.00012
14 – from Saskatoon to Asquith West Access	100	32.6	3,591	39 (0)	0.00033
7 – from Saskatoon to Jct Highway 60	110	5.4	10,300	25 (2)	0.00045
219 – from Saskatoon to Jct with CFB Dundurn access	100	31.1	3,415	77 (3)	0.00073
684 (Dalmeny Road) – from Highway 14 to Highway 16	90	9.7	3,610	1 (0)	0.00003

DISCUSSION/ANALYSIS

Posted Speed Limits and Design Speeds

The important factor in assessing the feasibility of increasing the speed limit on a street is to compare the design speed with the posted speed limit. The Transportation Association of Canada (TAC) defines design speed as:

“A speed selected for purposes of design and correlation of the geometric features of the road.”

Design criteria roadway geometry impacted by the design speed include: type of curb and gutter, type of sidewalk (separate or adjacent); type of cycling infrastructure; access management; type of land use; design vehicle; maximum vertical grades; driving lane width; crossfall value; superelevation details; minimum centreline radius curve; and number of lanes.

It is acceptable practice at lower posted speeds of up to 60 km/h to have a posted speed match a design speed. For higher speed facilities with posted speeds of 70 km/h or greater, the design speed is typically 10 km/h to 20 km/h higher than the posted speed. This builds in a factor of safety for a driver choosing to drive over the posted speed limit. The severity of incidents rises with speed, thus the factor of safety for higher speed roadways is required.

Street Design

Human factors are an important component of the road design process (how roads are built and how people use them). As these sections of McOrmond Drive and Central Avenue are through largely undeveloped areas, there is misalignment between the design of the roadways to support future development and driver expectation about how the roads operate today. Drivers expect that the roads should operate at much higher speeds than currently posted because the absence of adjacent development gives the roads the appearance of a higher speed facility. However, the design and infrastructure to safely operate at those higher speeds is not present.

Both McOrmond Drive between Fedoruk Drive and Central Avenue, and Central Avenue between Fedoruk Drive and McOrmond Drive were planned, designed, and built as major arterial streets through future residential neighbourhoods. As such, they have the characteristics of streets through neighbourhoods. The curves are not superelevated (banked), there are multi-use pathways adjacent to the roadway and there will be a relatively high number of intersecting roadways. The future supporting

land use is expected to be largely street-oriented without berms or noise attenuation walls adjacent to the roadway.

McOrmond Drive between Central Avenue and Wanuskewin Road was planned, designed, and built to operate as a major arterial street at a slightly higher design speed. The future land uses were expected to be largely commercial and not necessarily street-oriented, the curves along the roadway have a minor superelevation.

Feasibility Assessment

In consideration of the previous planning and design speeds in place for McOrmond Drive and Central Avenue, a feasibility assessment from an engineering perspective was completed.

Street	Section	Feasibility Commentary
Central Avenue	McOrmond Drive to Agra Road	Posted speed limit is 60 km/h, the design speed is 60 km/h, therefore unsafe to increase the posted speed limit and not feasible from an engineering perspective.
	Agra Road to south of Fedoruk Drive	Posted speed limit is 50 km/h, the design speed is 60 km/h, therefore feasible from an engineering perspective to increase the posted speed limit to 60 km/h.
McOrmond Drive	Fedoruk Drive to Northeast Swale	Posted speed limit is 50 km/h, the design speed is 60 km/h, therefore feasible from an engineering perspective to increase the posted speed limit to 60 km/h.
	Through Northeast Swale	Posted speed limit is 50 km/h, the design speed is 60 km/h, therefore feasible from an engineering perspective to increase the posted speed limit to 60 km/h.
	Northeast Swale to Central Avenue	Posted speed limit is 60 km/h, the design speed is 60 km/h, therefore unsafe to increase the posted speed limit and not feasible from an engineering perspective.
	Central Avenue to Wanuskewin Road	Posted speed limit is 70 km/h, the design speed is 80 km/h, therefore unsafe to increase the posted speed limit and not feasible from an engineering perspective.

Northeast Swale Working Group

The Northeast Swale Working Group (NSWG) was engaged early in the year, culminating in a formal meeting on January 28, 2020. A summary of the wildlife collisions provided to the working group is provided in Appendix 2. Upon review of data on traffic infractions and wildlife deaths, the group recognized that:

- animal interactions are an issue; and
- no animal deaths have been recorded on the 50 km/h portion of roadway through the Northeast Swale, indicating that roadway and fencing design for this portion of the road appears to be working when considering animal interactions.

Additionally, the group noted that wildlife fatality data typically underestimates actual mortality due to the following:

- animals that are fatally injured may move away from the accident site before dying and may not be detected;
- animals can be thrown some distances from a collision site and may not be detected; and
- scavengers tend to quickly and efficiently remove carcasses and as a result these animal fatalities may not be detected.

In summary, consensus of the NSWG was that increasing the posted speed limits is not desirable.

FINANCIAL IMPLICATIONS

Increasing the posted speed limits on the following three sections of roadway is feasible from an engineering perspective:

1. McOrmond Drive from Fedoruk Drive to the Northeast Swale from 50 km/h to 60 km/h;
2. McOrmond Drive through the Northeast Swale from 50 km/h to 60 km/h; and
3. Central Avenue from Agra Road to south of Fedoruk Drive from 50 km/h to 60 km/h.

The estimated total cost is estimated at \$11,000 to cover the change to signage. There is sufficient funding within existing operating budgets to undertake the work in 2020.

ENVIRONMENTAL IMPLICATIONS

The City and Meewasin Valley Authority have undertaken significant work in an effort to ensure that development (including roadway design and operation) occurs in a way that is sustainable and sensitive to existing natural areas and assets including:

- Northeast Swale Development Guidelines (2012)
- Northeast Swale Resource Management Plan (2013)
- Meewasin Northeast Swale Master Plan (2015)
- Triple Bottom Line Decision Making Tool (2019)
- Green Infrastructure Strategy (2020)
- Natural Capital Asset Valuation Project (2020)

The Northeast Swale Working Group has identified concerns with increased wildlife collisions if speed limits are increased.

OTHER IMPLICATIONS

There are no privacy, legal or social implications identified.

NEXT STEPS

Continue operating the roads with the current posted speed limits. Direction would be required from City Council for posted speed limit changes via an update to Traffic Bylaw, No. 7200.

APPENDICES

1. Map of Posted Speed Limits and Design Speeds
2. NCP Wildlife Fatalities

Report Approval

Written by: David LeBoutillier, Engineering Manager, Transportation
Jay Magus, Director of Transportation

Approved by: Terry Schmidt, General Manager, Transportation & Construction
Department

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