Technical Update to the May 18, 2018 *Downtown All Ages and Abilities Cycling Report:* Opportunities and Challenges of moving AAA route from 4th Avenue to 3rd Avenue

Purpose

This report identifies the opportunities and challenges of moving the All Ages and Abilities (AAA) cycling route from 4th Avenue to 3rd Avenue through downtown in the event that BRT is relocated to 1st Avenue.

Background

Following the conclusion of the Downtown Protected Bike Lane Demonstration in November 2017, the Administration began the Downtown All Ages and Abilities (AAA) Cycling Network study to determine the 'right streets' for a complete and connected AAA cycling network in downtown Saskatoon.

To ensure that the most appropriate streets host AAA facilities, the assessment took into consideration how cycling facilities connect to Saskatoon's wider cycling network, integration with other key downtown projects, and the impacts to all users in the downtown. In total, 12 streets were assessed using several factors, which correspond to one of the following six categories: Bicycle Network, Cyclist Safety, People Driving, People Walking, Transit and Business. Details of these assessment factors were included in the Downtown All Ages and Abilities Cycling Network Study presented to Govenance and Priorities Committee (GPC) on June 20, 2018.

The results of the analysis led to the proposed network of streets which included: Idylwyld Drive and 4th Avenue for the north-south streets, and 23rd Street and 19th Street, for the east-west streets.

These streets were selected based on a detailed understanding of trade-offs between the variety of users and functions that these downtown streets serve, striving to achieve a balance amongst all users. The network takes into consideration other downtown initiatives, integrating the impacts of those projects where applicable, as well as within the city wide cycling network.

At their meeting on June 20, 2018, GPC asked the Administration what the risks and benefits of moving the north-south route from 4th Avenue to 3rd Avenue if BRT was relocated to 1st Avenue. This report is intended to supplement the technical work presented on June 20, 2018 by highlighting the opportunities and challenges of moving one of the proposed AAA network streets from 4th Avenue to 3rd Avenue.

Importance of Developing a Connected, Direct Network

Connectivity and directness of routes are important considerations when developing a network for people riding bikes. Being cognizant of additional travel distance is an important consideration. In the City's representative survey last fall, 42% of respondents indicated that

one of the reasons they do not cycle to downtown is because they live too far away. Additionally, the 2013 Household Travel Survey indicated that Saskatoon residents prefer shorter bike trips, with the mean distance reported for trips by bicycle being 3.4 km. This illustrates that distance is a key factor in people's transportation choices. Adding distance or out-of-the-way travel to a destination increases the inconvenience of the trip, decreasing the likelihood that people will choose that route.

Summary

The following is a summary of the risks and benefits for locating the AAA cycling facility on 3rd Avenue rather than 4th Avenue. It should be noted that should the AAA cycling facility be installed on 3rd Avenue, 4th Avenue could be converted back to original geometric configuration of 4 travel lanes and 2 parking lanes.

3rd Avenue connects to existing and planned AAA facilities, extends directly beyond the study area boundaries, and is central to the Downtown providing balanced access to the facility within the downtown.

- 3rd Avenue is centred in Downtown, providing the most coverage and connectivity to the facility; and
- 3rd Avenue connects to the Traffic Bridge which connects to the raised cycle track on Victoria Avenue.

3rd Avenue requires few changes to lane designations to accommodate an AAA facility.

- Left turn bays are already developed on 3rd Avenue, which helps clarify motor vehicle movements and lane designations;
- Concrete centre median and existing landscaping in the median are retained; and
- 3rd Avenue has a consistent right-of-way width, which provides for a single configuration and design through the length of the facility.

An AAA facility on 3rd Avenue will impact motor vehicle travel time and level of service.

- Motor vehicle level of service and corridor travel time are impacted. Given that the traffic volumes on 3rd Avenue are less than half than those on 4th Avenue, the impacts to motor vehicles are less so than those on 4th Avenue.

An AAA facility on 3rd Avenue does reduce parking.

- Parking on 3rd Avenue would be reduced by approximately 54 parking spaces; parking on 4th Avenue would be returned to pre-protected bike lane installation numbers (approximately 152 spaces total with the restoration of those spaces previously removed for the demonstration project).

An AAA facility on 3rd Avenue has limited impact on transit if BRT is on 1st Avenue.

- There would be no conflict with BRT operations which would be located on 1st Avenue; and
- If transit feeder routes were added to 3rd Avenue in the future these transit stops could be addressed through design.

3rd Avenue has a high concentration of street activity.

- 3rd Avenue has a significant amount of street-level activity due to more storefronts, which can be more attractive for pedestrians and cyclists.

Detailed Comparison of 3rd Avenue and 4th Avenue Analysis

The following table is a side-by-side comparison of the factors used to evaluate 3rd Avenue and 4th Avenue to ensure a detailed understanding of trade-offs between the variety of users and functions that these downtown streets serve, striving to achieve a balance amongst all users.

	3rd Avenue	4th Avenue
Linkages to surrounding areas Corridors providing better linkages across major barriers such as busy streets and river crossings should be preferred.		
Connections – North	Extends beyond 25th Street.	Extends beyond 25th Street.
Connections - South	• Connects to Traffic Bridge at Spadina Crescent. • Intersection Improvements are planned at 3rd Avenue and 19th Street that will improve the connection to the Traffic Bridge.	Intersection improvements are planned that will improve the connection to the Broadway Bridge.
Coverage	75%	70%
Linkages with other cycling facilities Corridors that offer a strong potential for interconnection with existing and planned City bicycle facilities should be preferred.		
Bridges	• Direct connection to Traffic Bridge (Intersection improvements are planned.) • Connection to Broadway Bridge by way of 19th Street.	Northbound connection from Broadway Bridge to 4th Avenue is adequate. (Intersection improvements are planned.)
Existing AAA Facilities	Direct connection to Traffic Bridge and Cycle Track on Victoria Avenue.	None
Proposed AAA Facilities	None	None

<table>
<tr><th colspan="2"></th><th>3rd Avenue</th><th>4th Avenue</th></tr>
<tr><td colspan="4">Current and potential bicycle traffic
Corridors in which a large number of existing and potential bicycle trips originate and terminate should be preferred.</td></tr>
<tr><td></td><td>Key Destinations Served</td><td>• Francis Morrison Library
• City Hall
• Sturdy Stone
• Some retail shops
• Some restaurants
• Educational institutions</td><td>• Francis Morrison Library
• City Hall
• Sturdy Stone
• More office than retail
• Some restaurants</td></tr>
<tr><td colspan="4">Cyclist Safety
Corridors with fewer number of turning movements at intersections, driveways, and lanes should be preferred.</td></tr>
<tr><td></td><td>Motor Vehicles per Day</td><td>7,000 – 9,000 (estimated)</td><td>12,000 – 22,000 (estimated)</td></tr>
<tr><td></td><td>Number of driveways and lanes per block</td><td><table><tr><td>TOTAL</td><td>22</td></tr><tr><td>19th to 20th</td><td>6</td></tr><tr><td>20th to 21st</td><td>4</td></tr><tr><td>21st to 22nd</td><td>4</td></tr><tr><td>22nd to 23rd</td><td>2</td></tr><tr><td>23rd to 24th</td><td>2</td></tr><tr><td>24th to 25th</td><td>4</td></tr></table></td><td><table><tr><td>TOTAL</td><td>28</td></tr><tr><td>19th to 20th</td><td>3</td></tr><tr><td>20th to 21st</td><td>4</td></tr><tr><td>21st to 22nd</td><td>4</td></tr><tr><td>22nd to 23rd</td><td>3</td></tr><tr><td>23rd to 24th</td><td>6</td></tr><tr><td>24th to 25th</td><td>5</td></tr></table></td></tr>
<tr><td></td><td>Merit of segregation</td><td colspan="2">When speeds are over 30 km/hr and traffic volumes exceed 1,500 vehicles per day, AAA facilities should be separated from motor vehicles. Both streets exceed this volume and speed, and therefore merit segregation.</td></tr>
<tr><td colspan="4">Pedestrian Improvements
Corridors that have potential to improve pedestrian safety should be preferred. For example, pedestrian separation from motor vehicles and cyclists or changes to crossing distances at intersections improve conditions for people waking. Downtown streets were assessed for existing pedestrian conditions (such as streetscaping) and whether inclusion of a cycling facility could provide any additional benefit for pedestrians.</td></tr>
<tr><td></td><td>Opportunity for improvements</td><td>Streetscaped from 19th Street to 23rd Street. AAA facility would further increase buffer from vehicle traffic.</td><td>Already streetscaped but offer increased buffer from vehicle traffic.</td></tr>
<tr><td></td><td>Accessibility</td><td colspan="2">Accessibility needs, such as accessible parking or raised curb treatments, can be applied to both streets and will be addressed through detailed design. Additional details on the design treatments is contained within Attachment 7 of the October 15, 2018 Committee Report.</td></tr>
<tr><td colspan="4">Transit
Corridors with fewer bus stops and lower frequency of bus service should be preferred as there will be fewer conflicts between cyclists and passengers entering or exiting buses.</td></tr>
<tr><td colspan="2"></td><td></td><td>3rd Avenue</td><td>4th Avenue</td></tr>
<tr><td></td><td rowspan="2">Transit stop conflicts</td><td>Current # of Transit Stops</td><td>12</td><td>3</td></tr>
<tr><td></td><td>Future # of Transit Stops</td><td>3</td><td>0</td></tr>
<tr><td></td><td rowspan="2">Transit operations</td><td>Current Transit Route</td><td>Yes</td><td>Yes</td></tr>
<tr><td></td><td>Future Transit Route</td><td>No BRT (BRT on 1st)</td><td>No BRT (BRT on 3rd or 1st)</td></tr>
</table>

Business

Parking

Corridors where implementation of the bicycle facility will have the lowest relative impact on the total on-street parking supply should be preferred. The number of parking spaces along a street were quantified to understand the number of parking spaces that would be removed by the installation of a cycling facility on the corridor. The current number of parking spaces identified below are from the 2016 Parking Study.

Street Environment

Implementation of a bicycle facility will provide sidewalks with additional buffering from automobiles and improve the pedestrian environment, with likely benefits for street-level commerce. Corridors with a significant amount of street-level commerce should therefore be preferred. Generally speaking, the higher number of building entrances the more active the street level environment will be. The numbers outlined below were obtained from inventory gathered in phase one of the City Centre Plan: Public Spaces, Activity + Urban Form Strategic Framework.

			3rd Avenue	4th Avenue
	Parking	Current number of Spaces	156	152
		Number of Spaces with AAA	102	94
		Change in Number of Spaces	-54	-58
	Street environment	Number of building entrances	96 (6.8 per block face)	41 (3.4 per block face)

Right-of-way Constraints

Downtown streets have varying Right-of-Way (ROW) widths. As well, the pavement width between curbs are different depending on streetscaping and traffic controls. All downtown streets were determined to have adequate space with the exception of Spadina Crescent. Spadina Crescent was ruled out for a AAA facility because of limited available ROW due to the wide promenade on the east side with mature trees and elevation differences between the sidewalk and boulevard on the west side.

	3rd Avenue		4th Avenue	
	Pavement (m)	ROW (m)	Pavement (m)	ROW (m)
19th to 20th	22.9	30.2	20.7	30.2
20th to 21st	22.9	30.2	20.7	30.2
21st to 22nd	22.9	30.2	20.7	30.2
22nd to 23rd	22.9	30.2	20.7	30.2
23rd to 24th	22.9	30.2	20.4	30.2
24th to 25th	22.9	30.2	16.8	30.2

Motor Vehicle Traffic Flow Assessment

Synchro and SimTraffic traffic analysis software programs were used to model the downtown street network. This program includes traffic information, roadway configuration information, and traffic signal design and timing information as inputs. Program outputs include traffic performance measures and parameters that can be used to set signal timing and change or optimize traffic signal performance. Synchro can be readily used to forecast traffic changes

through a change in the street configuration to add a AAA facility or reassign vehicle traffic lanes. It can readily predict changes in traffic performance and may suggest minor changes in signal timing to alleviate potential problems.

The Synchro model was adjusted to remove one vehicle lane or turn lanes and add turn lanes where necessary to accommodate protected bike lanes and manage conflicts. All downtown streets were determined to have spare capacity.

Delay is defined as "the additional travel time experienced by a driver" in the Highway Capacity Manual (HCM). This includes time spent decelerating, waiting at a signal, and accelerating. Intersection delay is the average control delay for all approaching vehicles based on the amount of volume within each lane approaching the signal. Typically, the Level of Service (LOS) within a central business district during the peak hours should be better than LOS E.

Travel time through the signalized corridors of each street was evaluated using SimTraffic to account for accumulated delays and queues between intersections.

	3rd Avenue		4th Avenue	
	Existing	**AAA**	**Existing**	**AAA**
19th	C	C	B	B
20th	B	C	B	C
21st	B	B	B	C
22nd	C	C	B	C
23rd	B	B	B	B
24th	B	B	B	B
Travel time (min)	3.14	4.67	2.20	4.50
Change (min)		+ 1.53		+ 2.30
Peak direction	Southbound		Southbound	

LOS	Average Delay per vehicle (seconds)
A	≤ 10
B	> 10-20
C	> 20-35
D	> 35-55
E	> 55-80
F	> 80

Spadina Crescent as an AAA Route

Spadina Cres has been raised by stakeholders and the community a preferable option to 3rd or 4th Avenue as the north-south AAA cycling network route through Downtown. However, an AAA facility along Spadina Crescent has some very important considerations that work against a connected and convenient network:

- Spadina Crescent does not connect with the core of downtown; the path of the street travels away from downtown;
- Spadina Crescent does not connect people with a high concentration of employment or key downtown destinations;
- Due to the limited available pavement width on Spadina Crescent, the majority of the parking on Spadina Crescent would need to be removed; and
- An AAA facility along Spadina Crescent does not maximize investment in the AAA network due to the proximity of the existing Meewasin trail.