Minutes – Standing Policy Committee on Infrastructure Renewal and Public Works – June 25, 2019

REPORTS

Item No. 21 Traffic Study – Left Turn Signal at Pembina Highway and Bairdmore Boulevard / Dalhousie Drive (North) (Waverley West Ward)

STANDING COMMITTEE DECISION:

The Standing Policy Committee on Infrastructure Renewal and Public Works concurred in the recommendation of the Winnipeg Public Service and approved the following:

1. That a protected left turn phase be installed at Pembina Highway and Bairdmore Boulevard/Dalhousie Drive (north) intersection.

2. That the Proper Officers of the City be authorized to do all things necessary to implement the intent of the foregoing.

Minutes – Standing Policy Committee on Infrastructure Renewal and Public Works – June 25, 2019

DECISION MAKING HISTORY:

Moved by Councillor Browaty,

That the recommendation of the Winnipeg Public Service be concurred in.

Carried

STANDING COMMITTEE RECOMMENDATION:

On January 8, 2019, the Standing Policy Committee on Infrastructure Renewal and Public Works concurred in the recommendation of the Assiniboia Community Committee and directed the Winnipeg Public Service to conduct a traffic study to determine if a left turn signal for northbound traffic on Pembina turning west onto Bairdmore Boulevard is warranted and report back to the Standing Committee within 180 days.

COMMUNITY COMMITTEE RECOMMENDATION:

On November 13, 2018, the Assiniboia Community Committee passed the following motion:

WHEREAS southbound traffic on Pembina Highway is increasing due to the expansion of Waverley West, and an increase in new apartments;

AND WHEREAS northbound Pembina Highway traffic turning west onto Bairdmore Boulevard is becoming increasingly difficult due to an increase in southbound Pembina traffic;

AND WHEREAS there has been a dramatic increase in vehicular traffic turning left on a red light due to limited signal timing;

THEREFORE BE IT RESOLVED that the Standing Policy Committee for Infrastructure Renewal and Public Works be requested to direct the Winnipeg Public Service to conduct a traffic study to determine if a left turn signal for northbound traffic on Pembina turning west onto Bairdmore Boulevard is warranted.

ADMINISTRATIVE REPORT

Title: Traffic Study – Left Turn Signal at Pembina Highway and Bairdmore Boulevard / Dalhousie Drive (north)

Critical Path: Standing Policy Committee on Infrastructure Renewal and Public Works

AUTHORIZATION

Author	Department Head	CFO	CAO
D. Patman, P.Eng.	J. Berezowsky	P. Olafson, Interim CFO	M. Ruta, Interim CAO

EXECUTIVE SUMMARY

The performance of the northbound left turn at Pembina Highway and Bairdmore Boulevard was reviewed in accordance with City's guidelines for protected left turn phases. The level of service is considered acceptable but the collision history over the past 5 years indicates that a protected left turn phase would improve the intersection safety.

The Public Service is recommending upgrading the signals at Pembina Highway and Bairdmore Boulevard/Dalhousie Drive (north) to include a protected left phase for northbound and southbound vehicles. Installation of the protected left turn signal phase is estimated at $5,000.00 and is to be funded by the 2019 TEIP capital project. There are currently left turn permissive phases for northbound and southbound Pembina Highway; this upgrade would not increase operating or maintenance costs.

RECOMMENDATIONS

1. That a protected left turn phase be installed at Pembina Highway and Bairdmore Boulevard/Dalhousie Drive (north) intersection.

2. That the proper officers of the City be authorized to do all things necessary to implement the intent of the foregoing.

REASON FOR THE REPORT

On January 8, 2019 The Standing Policy Committee on Infrastructure Renewal and Public Works concurred in the recommendation of the Assiniboia Community Committee and directed the Winnipeg Public Service to conduct a traffic study to determine if a left turn signal for northbound traffic on Pembina Highway turning west onto Bairdmore Boulevard is warranted and report back to the Standing Committee within 180 days.

IMPLICATIONS OF THE RECOMMENDATIONS

The cost for installation of the protected turn signal phase is estimated at $5,000.00 plus overheads. Total estimated costs are to be funded through the 2019 Traffic Engineering Improvements – Various Locations (TEIP) capital project.

HISTORY/DISCUSSION

BACKGROUND INFORMATION

On February 28, 2017 The Standing Policy Committee on Infrastructure Renewal and Public Works concurred in the recommendation of the Winnipeg Public Service:

1. That a northbound protected left turn phase not be installed at the intersection of Pembina Highway and Bairdmore Boulevard / Dalhousie Drive (north intersection, near 2671 Pembina Highway).

Item No. 10: Traffic Signals – Pembina Highway at Bairdmore Boulevard North and Bairdmore Boulevard South

CURRENT TRAFFIC CHARACTERISTICS

Pembina Highway in the vicinity of Bairdmore Boulevard / Dalhousie Drive (North Leg) is a six-lane divided roadway, a regional street, a full time truck route, and a Transit route; with an Average Weekday Daily Traffic (AWDT) volume of approximately 47,500 vehicles, and a speed limit of 60 km/h.

The traffic control signals are interconnected with the adjacent traffic control signals on Pembina Highway, and a 120-second cycle length at all intersections allows efficient signal coordination along this route (cycle length is the length of time required to go through all of the signal phases once).

LEFT TURN PHASE – WARRANT CRITERIA

Motorists may turn left on a green ball signal indication at signalized intersections after yielding the right-of-way to opposing vehicular and pedestrian traffic. Under certain conditions, an additional conflict-free left turn phase (green arrow) may be provided. The Public Service has a Technical Guideline and Practice it uses for guidance for consideration of implementing a left turn phase, developed from the Manual of Uniform Traffic Control Devices for Canada (MUTCDC); a national guideline.

Adding a separate left turn arrow phase generally results in an increase of overall average delay and reduces the total intersection vehicular capacity because the time for the left turn arrow phase must be taken from other movements at the intersection, or added to the total cycle length. Therefore, to benefit from a left turn phase, the left turn vehicular volume must represent a significant portion of the total intersection volume and experience delays in excess of one signal cycle on a regular basis. Gaps in the opposing traffic flow and/or the amber clearance phase generally accommodates at least two left turning vehicles per signal cycle, or 60 vehicles per hour based on the cycle length of 120 seconds.

To warrant installation of a separate left turn phase at either of these intersections, the primary criterion of the Technical Guideline and Practice must be fulfilled: the left turn demand must exceed two vehicles per signal cycle (60 vehicles per hour) for at least four hours of a typical weekday. If the primary criterion is fulfilled, the applicable secondary criteria are then considered:

1. More than 25% of the left-turning volume must be delayed by more than one signal cycle during the highest hour during the peak traffic period;
2. More than 12 collisions involving left-turning motorists (same approach) for the most recent three year reporting period;
3. The average number of left turns during the intergreen (the time between the green signal displays, i.e. the amber and red signal displays) exceeds 2.0 PCUs (Passenger Car Units). The PCU count does not include vehicles established in the intersection during the green phase and clearing on the amber/red phases.
4. The left-turn transit demand exceeds 3 in-service vehicles per hour.

Adding a left turn phase is undesirable under any of the following circumstances:
1. There is insufficient green time within the current cycle length to allow a left turn phase;
2. The left turn phase will encourage neighbourhood traffic infiltration;
3. The left turn phase will increase stops and delays significantly.

NORTHBOUND LEFT TURN REVIEW AT BAIRDMORE BOULEVARD / DALHOUSIE DRIVE

A summary of the intersection turning movement manual vehicle count for the AM Peak Hour (between 07:00-09:00) and PM Peak Hour (between 15:30-17:30) is provided below:

Time	NORTHBOUND ON				SOUTHBOUND ON				EASTBOUND ON				WESTBOUND ON				
	PEMBINA HWY				PEMBINA HWY				BAIRDMORE BLVD N				DALHOUSIE DR N				TOTAL
Time Ending	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	
AM Peak	AM Peak Hour (between 7:00 and 9:00), based on total volume, is from:													8:00 - 9:00			
Hour	5	38	2,069	52	5	251	767	76		205	158	75		47	67	385	4,200
PM Peak	PM Peak Hour (between 15:30 and 17:30), based on total volume, is from:													16:30 - 17:30			
Hour	3	69	1,125	69	2	316	1,978	267		116	53	76		104	88	271	4,537

During the PM Peak Hour, being the hour of highest demand, the northbound left turn demand averages 2.4 vehicles per signal cycle. During the four busiest hours of the day, the northbound left turn demand averages 2.2 vehicles per signal cycle. With average left turn demand being greater than 2.0 vehicles per cycle, the City's primary criterion for a northbound left turn phase is met.

As the primary criterion for consideration of a left turn phase was satisfied, a cycle-by-cycle observation was undertaken during the PM peak period, for the northbound left turn movement to determine if more than 25% of the left-turning volume was delayed by more than one signal cycle (refer to 1. of the secondary criteria listed above). During the observation, more than 75% of vehicles were able to complete the northbound left turn maneuver on the first cycle (i.e. less than 25% of the left-turning volume was delayed by more than one signal cycle). This level of service is considered acceptable. During the previous observation in relation to the February 28, 2017 review, all vehicles were able to complete the northbound left turn maneuver on the first cycle. This demonstrates that traffic volumes are increasing, and that a protected left turn phase may be warranted in the future.

The warrant criteria for left turn signal consideration for collisions is the latest three years of collision history, the warrant is twelve collisions. The collision data for the intersection of Pembina Highway and Bairdmore Boulevard/Dalhousie Drive (north) was reviewed for the past five years of available collision data (2013-2017).

In Table 1 below, there are two types of collisions summarized. The "Intersection 90 Degree" collisions, are collisions indicated in the collision report, one vehicle was making a left hand turn

and was impacted at 90 degrees. These collisions offer a variety of configurations but should be considered based on the left turn inclusion in the reporting. The other type summarized are "Left Turn (opposing)" collisions, which are collisions where one vehicle was making a left hand turn and collided with or was struck by another vehicle travelling in the opposite, original direction. For example, a vehicle travelling southbound on Pembina Highway, making a left turn to go eastbound right onto Dalhousie Drive, is struck by a vehicle travelling northbound on Pembina Highway. For the warrant analysis, only collisions of the "left turn (opposing)" are considered. In the past three years of available collision data, there were nine collisions, with six of these occurring in 2017. Of the six collisions, two resulted in injury. As the collision warrant is quickly approaching 12, the Public Service recommends installing protected left turn signals at this intersection for northbound and southbound Pembina Highway.

Year	Impact Type	Number of Collisions	Property Damage Only	Non-fatal Injury
2015	Intersection 90 Degree	3	1	2
	Left Turn (opposing)	1	1	0
2016	Intersection 90 Degree	3	1	2
	Left Turn (opposing)	2	0	2
2017	Intersection 90 Degree	7	4	3
	Left Turn (opposing)	6	4	2

Table 1: Pembina Highway and Bairdmore Boulevard/Dalhousie Drive (north) Collision Summary for Left Turn Consideration

Installation of the protected left turn signal phase is estimated at $5000. There are currently left turn permissive phases for northbound and southbound Pembina Highway; this upgrade would not increase operating or maintenance costs.

FINANCIAL IMPACT

Financial Impact Statement

Date: May 30, 2019

Project Name:

First Year of Program **2019**

Traffic Study – Left Turn Signal at Pembina Highway and Bairdmore Boulevard/Dalhousie Drive (north)

	2019	2020	2021	2022	2023
Capital					
Capital Expenditures Required	$ 5,250	$ -	$ -	$ -	$ -
Less: Existing Budgeted Costs	5,250	-	-	-	-
Additional Capital Budget Required	$ -	$ -	$ -	$ -	$ -
Funding Sources:					
Debt - Internal	$ -	$ -	$ -	$ -	$ -
Debt - External	-	-	-	-	-
Grants (Enter Description Here)	-	-	-	-	-
Reserves, Equity, Surplus	-	-	-	-	-
Other - Enter Description Here	-	-	-	-	-
Total Funding	$ -	$ -	$ -	$ -	$ -
Total Additional Capital Budget Required	$ -				
Total Additional Debt Required	$ -				
Current Expenditures/Revenues					
Direct Costs	$ -	$ 158	$ 158	$ 158	$ 158
Less: Incremental Revenue/Recovery	250	-	-	-	-
Net Cost/(Benefit)	$ (250)	$ 158	$ 158	$ 158	$ 158
Less: Existing Budget Amounts	-	-	-	-	-
Net Budget Adjustment Required	$ (250)	$ 158	$ 158	$ 158	$ 158

Additional Comments: Total estimated cost of $5,250.00 will be funded by the 2019 Traffic Engineering Improvements program (Public Works Capital Project #1831000119). Incremental Revenue/Recovery represents Departmental Engineering Overhead and Corporate Interest Overhead. Direct costs represent the Debt and Finance charges on Internal Financing.

"Original Signed by J. Ruby, CPA, CA"

J. Ruby CPA, CA
Manager of Finance and Administration

CONSULTATION

This Report has been prepared in consultation with: n/a

OURWINNIPEG POLICY ALIGNMENT

The recommendation of this report is aligned with the key strategic goal of a safe, efficient and equitable transportation system for people, goods and services in the Sustainable Transportation Direction Strategy that supports OurWinnipeg.

SUBMITTED BY

Department: Public Works
Division: Transportation
Prepared by: T. Jangula, C.E.T., Traffic Analyst
C. Flather, P.Eng., M.Sc., Traffic Management Engineer
Date: June 4, 2019
File No.: R-09