August 21, 2023

Mr. Michel Ouellet, M.A.Sc., P. Eng.
Town of Riverview, Director of Engineering & Public Works
300 Robertson Street
Riverview NB, E1B 0T8 [Via Email: moullet@townofriverview.ca]

RE: Traffic Signal Warrant Review, Coverdale Road at Trites Road
Riverview, New Brunswick

Dear Mr. Ouellet,

Long delays and periodic traffic queueing has been observed on Trites Road at the approach to Coverdale Road. We have completed a traffic control review to compare how the intersection would perform with traffic signals versus the existing stop control. We have also completed a traffic signal warrant for Coverdale Road at Trites Road using traffic and pedestrian volume counts provided by the Town to determine the level of priority that should be placed on potential modifications to traffic control.

DESCRIPTIONS OF ROADWAYS AND INTERSECTION

Coverdale Road is a 2-lane arterial roadway, with sidewalks and bike lanes on both sides of the study area. Coverdale Road runs from NB Route 112 at Ritchie Road to Hillsborough Road at Gunningsville Bridge. The posted speed limit at the intersection with Trites Road is 50km/h with the speed limit increasing to 70km/h approximately 300m west of the intersection.

Trites Road is a 2-lane minor urban collector roadway extending from Coverdale Road to Callowhill Road. The statutory speed limit is 50km/h. There is a sidewalk on the east side of the road at the study intersection and bike lanes on both sides of the road. The bike lane on the east side of Trites Road ends approximately 70m before the intersection in the northbound direction (cyclists must cross through Petro-Canada parking lot).

The intersection of **Coverdale Road at Trites Road** (See Figure 1) is stop controlled on Trites Road with free flow traffic along Coverdale Road. The northbound approach has an exclusive left turn lane and an exclusive right turn lane. The westbound approach has an exclusive left turn lane and a through lane. The eastbound approach has a shared through-right lane. A marked crosswalk is provided across the stop-controlled side street and across Coverdale Road at the westbound approach with pedestrian activated overhead flashing beacons.

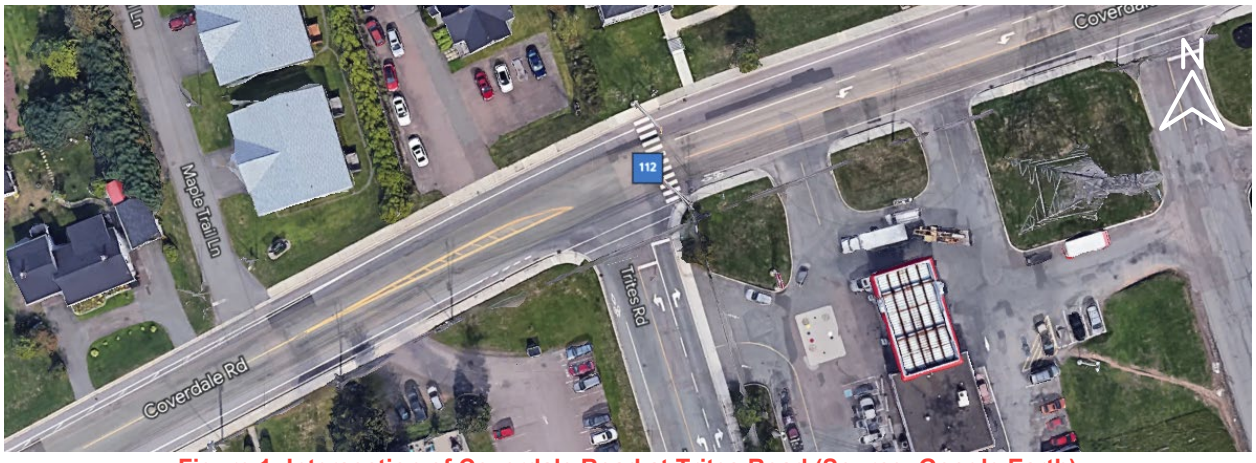

Figure 1: Intersection of Coverdale Road at Trites Road (Source: Google Earth)

PEDESTRIAN AND VEHICULAR VOLUME DATA

A pedestrian and vehicular volume count was collected at the intersection of Coverdale Road at Trites Road by the Town of Riverview for the AM, midday, and PM peak periods on May 10, 2023. The data are tabulated in Appendix A. Design hourly volumes were estimated by applying a 10% adjustment factor to the one day counted volumes.

INTERSECTION OPERATIONAL ANALYSIS

An intersection performance analysis was completed for the intersection using the existing lane configuration and stop sign control on Trites Road during the AM and PM peak periods. Additional analysis was completed with the traffic control modified to traffic signals to compare how the intersection would operate if upgraded with traffic signals.

Synchro 11 software has been used for performance evaluation of the Coverdale Road at Trites Road Intersection. Summaries of the results are included in Appendix B.

The level or quality of performance of an intersection in terms of traffic movement is determined by a level of service (LOS) analysis. LOS for intersections is defined in terms of delay, which is a measure of driver discomfort and frustration, fuel consumption, and increased travel time.

LOS criteria, as shown in Table 1, are stated in terms of average control delay per vehicle which includes initial deceleration delay, queue move-up time, stopped delay, and final acceleration delay.

Table 1 - Level of Service Criteria

Signalized Intersections Control Delay (Seconds per Vehicle)	LOS Description	Roundabouts *and* Two Way Stop Controlled (TWSC) Intersections Control Delay (Seconds per Vehicle)
Less than 10.0	Very low delay; most vehicles do not stop **(Excellent)**	Less than 10.0
Between 10.0 and 20.0	Higher delay; most vehicles stop **(Very Good)**	Between 10.0 and 15.0
Between 20.0 and 35.0	Higher level of congestion; number of vehicles stopping is significant, although many still pass through intersection without stopping **(Good)**	Between 15.0 and 25.0
Between 35.0 and 55.0	Congestion becomes noticeable; vehicles must sometimes wait through more than one red light; many vehicles stop **(Satisfactory)**	Between 25.0 and 35.0
Between 55.0 and 80.0	Vehicles must often wait through more than one red light; considered by many agencies to be the limit of **acceptable** delay	Between 35.0 and 50.0
Greater than 80.0	This level is considered to be unacceptable to most drivers; occurs when arrival flow rates exceed the capacity of the intersection **(Unacceptable)**	Greater than 50.0

Operational performance results for are provided in Table 2 for both the AM and PM peak hours. Using the design hourly volumes with existing intersection conditions (Scenario 1), all movements during the AM peak hour are expected to operate within recommended Guidelines, but the PM peak hour experiences high delay (75 seconds) and poor level of service (F) for the northbound left-turn from Trites Road.

Signalizing the intersection (Scenario 2), would improve the poor performance of the northbound left movement. With simple signal timings and existing lane configurations, the PM peak hour would experience a 16.1 second delay and level of service B in the northbound left-turning direction from Trites Road and all movements operating with LOS B or better.

Table 2 - Intersection Performance Analysis - Coverdale Road at Trites Road

LOS Criteria	Control Delay (sec/veh), Level of Service (LOS), v/c Ratio, and 95th %ile Queue (m) by Intersection Movement					Overall Intersection	
	Coverdale Road			Trites Road			
	EB-TR	WB-L	WB-T	NB-L	NB-R	Delay	LOS
Scenario 1 - AM Peak Hour (Page B-1)							
Delay	0.0	10.0	0.0	29.1	16.7	3.7	B
LOS	-	B	-	**D**	C		
v/c	0.45	0.15	0.11	0.20	0.31		
Queue	0.0	0.4	0.0	5.9	10.3		
Scenario 2 - AM Peak Hour - **signalized** (Page B-3)							
Delay	13.9	16.4	5.3	19.3	8.0	12.4	B
LOS	B	B	A	B	A		
v/c	0.78	0.55	0.19	0.13	0.36		
Queue	80.3	20.5	14.5	10.7	12.5		
Scenario 1 - PM Peak Hour (Page B-2)							
Delay	0.0	9.2	0.0	**75.4**	12.5	6.0	A
LOS	-	A	-	**F**	B		
v/c	0.27	0.21	0.35	0.59	0.25		
Queue	0.0	0.6	0.0	22.7	8.0		
Scenario 2 - AM Peak Hour - **signalized** (Page B-4)							
Delay	8.8	12.6	11.7	16.1	6.6	10.6	B
LOS	A	B	B	B	A		
v/c	0.53	0.55	0.67	0.19	0.37		
Queue	36.5	25.7	52.7	13.1	11.9		

TRAFFIC SIGNAL WARRANT ANALYSIS

A signal warrant analysis is completed to determine if the installation of traffic signals at an intersection will provide a positive impact on total intersection operation. That is, the benefits in time saved and improved safety that will accrue to vehicles entering from a side street will exceed the impact that signals will have in time lost and potential additional collisions for vehicles approaching the intersection on the main street.

The *Canadian Traffic Signal Warrant Matrix Analysis* (Transportation Association of Canada (TAC), 2005) considers 100 warrant points as an indication that traffic signals will provide a positive impact. Signal warrant analysis uses vehicular and pedestrian volumes, and intersection, roadway, and study area characteristics to calculate a warrant point value.

Analysis using the 2023 design hourly volumes indicates 72 signal warrant points at the Coverdale Road at Trites Road intersection, as shown in Table C-1, Appendix C.

With long delays to turn left from Trites Road, many vehicles are expected to be using other intersections along Coverdale Road to turn left and travel to the west. This includes some of the traffic that is currently travelling through Canusa Drive to turn westbound to Coverdale Road at the Monarch Road intersection as

well as some of the left turn traffic from Wentworth Drive and Ogden Drive. Some of the westbound left turning traffic is likely backtracking to use the traffic signals at Buckingham Avenue to turn left to Coverdale Road. With addition of traffic signals at the Trites Road intersection, delay to traffic from Trites Road will be reduced which is expected to divert traffic from other routes and increase the volume of left turning traffic at Trites Road.

Traffic volumes along Coverdale Road and Trites Road are increasing each year. A traffic signal warrant analysis has been completed including an additional left 25 left turning vehicles from Trites Road expected to be diverted from other adjacent Coverdale Road intersections and a 15% increase to 2023 volume to account a few years of ongoing background volume growth in the area. With the future volume scenario, the traffic signal warrant achieves 107 points (Table C-2, Appendix C) indicating that traffic signals are warranted. This indicates that traffic signals will have a positive impact to operation of the Coverdale Road at Trites intersection.

SUMMARY

1. There are long delays for traffic turning from Trites Road, notably the left turn movement during the PM peak period.
2. Due to the longer delays for left turning traffic from Trites Road, some traffic is using other routes to turn and travel west on Coverdale Road. With traffic signals, it is expected that some traffic from other routes will divert and use Trites Road to travel west on Coverdale Road.
3. The intersection of Coverdale Road at Trites Road currently has a traffic signal warrant of 72, with diversion of traffic expected to use the intersection with addition of traffic signals and background growth to traffic volumes over the next few years, the intersection is expected to achieve a traffic signal warrant of 107. This indicates that traffic signals will have a positive impact to operation of the Coverdale Road at Trites intersection.

RECOMMENDATION

4. Since traffic signals are expected to be warranted at the intersection of Coverdale Road at Trites Road within the next few years, and traffic signals are projected to improve operation of the intersection, planning should begin for the installation of traffic signals at the intersection.

If you have any questions or comments, please contact me by email at greg.obrien@wsp.com or by telephone at 902-444-8347.

Sincerely,

Greg O'Brien, P.Eng.
Atlantic Practice Manager – Traffic Engineering & Transportation Planning
WSP Canada Inc.