

Agenda – Standing Policy Committee on Public Works – January 10, 2023

REPORTS

**Item No. 11 Traffic Study – Kenaston Common Drive and Kenaston Boulevard
(Charleswood-Tuxedo-Westwood Ward)**

WINNIPEG PUBLIC SERVICE RECOMMENDATION:

1. That this report be received for information.

Agenda – Standing Policy Committee on Public Works – January 10, 2023

DECISION MAKING HISTORY:

STANDING COMMITTEE RECOMMENDATION:

On April 6, 2022, 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 report back in 180 days on the matter.

COMMUNITY COMMITTEE RECOMMENDATION:

On March 23, 2022, the Assiniboia Community Committee passed the following motion:

WHEREAS the area known as Kenaston Common continues to expanded to accommodate an increase in customers;

AND WHEREAS traffic from Kenaston Common Drive does not have sufficient time for a left turn onto Kenaston Boulevard, resulting in vehicles navigating the turn on yellows and sometimes red lights;

THEREFORE BE IT RESOLVED that the Standing Policy Committee on Infrastructure Renewal and Public Works be requested to direct the Winnipeg Public Service to conduct a traffic study to determine if the following are warranted:

1. A left turn signal for traffic turning northbound from Kenaston Common Drive onto Kenaston Boulevard; and
2. Allowing both northbound lanes on Kenaston Common Drive to turn left onto Kenaston Boulevard.

ADMINISTRATIVE REPORT

Title: Traffic Study – Kenaston Common Drive and Kenaston Boulevard

Critical Path: Standing Policy Committee on Public Works

AUTHORIZATION

Author	Department Head	CFO	CAO
D. Patman, P. Eng.	B. Neirinck On behalf of J. Berezowsky	C. Kloepfer	M. Jack

EXECUTIVE SUMMARY

The Public Service has reviewed the traffic operations and the left-turn signal phase warrant for the Kenaston Common Drive / Lindenwood Drive E and Kenaston Boulevard intersection (“the intersection”). The implementation of an eastbound (to northbound Kenaston Boulevard) left-turn signal phase is warranted based on the left-turn volume and delay. To optimize the signal timing/phasing, the implementation of a westbound (to southbound Kenaston Boulevard) left-turn signal phase will also be installed. Allowing both northbound lanes on Kenaston Common Drive to turn left onto Kenaston Boulevard (eastbound left-turn) is not recommended.

The Public Service will be upgrading the traffic control signals at the intersection to include left-turn signal phases for eastbound and westbound vehicles. Installation of the left-turn signal phases can be implemented under the Public Service’s existing authority.

The cost to install the left-turn signal phases and associated works is estimated at \$20,000. These modifications are to be funded by the Traffic Engineering Improvements Program.

RECOMMENDATIONS

1. That this report be received for information.

REASON FOR THE REPORT

On April 6, 2022, 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 report back in 180 days on conducting a traffic study to determine if the following are warranted:

1. A left turn signal for traffic turning northbound from Kenaston Common Drive onto Kenaston Boulevard; and
2. Allowing both northbound lanes on Kenaston Common Drive to turn left onto Kenaston Boulevard.

IMPLICATIONS OF THE RECOMMENDATIONS

There are no direct implications to receiving this report as information. Installation of the left-turn signal phases modification of the eastbound lane designation can be implemented under the Public Service's authority. The cost to install the left-turn signal phases and associated works is estimated at \$20,000. These modifications are to be funded by the Traffic Engineering Improvements Program.

HISTORY/DISCUSSION

BACKGROUND INFORMATION

On April 6, 2010, the Standing Policy Committee on Infrastructure Renewal and Public Works concurred in the recommendation of the Winnipeg Public Service and approved:

4. That geometric improvements be undertaken at the following locations:
 - B. Lindenwood Drive East at Kenaston Boulevard

The slotted westbound left-turn storage lane was completed as part of the 2010 Traffic Engineering Improvements Program (TEIP), and is on the east side of the Kenaston Common Drive / Lindenwood Drive E and Kenaston Boulevard intersection ("the intersection") for westbound left-turning vehicles.

The intention of the project was to overcome the restricted visibility and improve eastbound left-turn (from Kenaston Common Drive) capacity and safety. Eastbound left-turning drivers had difficulty seeing oncoming westbound through vehicles due to obstructed sight lines created by westbound left turning vehicles and the curvature of the roadway. Consequently, many eastbound left turning drivers did not take advantage of the available gaps in the opposing traffic flow.

The project helped improve the traffic operations for the eastbound left-turn at the intersection in the short term. However, due to continuing growth in the south-west region of the city since the time of the project (such as the Kenaston Boulevard extension which opened in 2014, Waverley West development, South Landing development in the RM, etc.), additional measures are now required to accommodate the traffic volumes.

KENASTON COMMON DRIVE / LINDENWOOD DRIVE E AND KENASTON BOULEVARD INTERSECTION

Kenaston Boulevard in the vicinity of Kenaston Common Drive / Lindenwood Drive E is a four-lane divided roadway, a Regional Street, and a Full Time Truck Route, with an Average Weekday Daily Traffic (AWDT) volume of approximately 52,300-59,800 vehicles (2019 Traffic Flow Map), and a speed limit of 80 km/h. There are dual left-turn lanes on both northbound and southbound Kenaston Boulevard (to westbound Kenaston Common Drive, and eastbound Lindenwood Drive E, respectively). The traffic control signals are interconnected with the adjacent traffic control signals on Kenaston Boulevard, and a cycle length of 110-150 seconds (depending on time of day) allows signal coordination along this route (cycle length is the length of time required to go through all of the signal phases once).

Kenaston Common Drive (eastbound approach) in the vicinity of Kenaston Boulevard is a four-lane divided privately owned roadway serving the commercial development. The eastbound left-turn (to northbound Kenaston Boulevard) is currently a permissive movement, where turns can be made during the green ball phase.

Lindenwood Drive E (westbound approach) in the vicinity of Kenaston Boulevard is a four-lane divided collector roadway, and a Transit Route; with an AWDT volume of approximately 8,600 vehicles, and a speed limit of 50 km/h. The westbound left-turn (to southbound Kenaston Boulevard) is currently a permissive movement, where turns can be made during the green ball phase.

The intersection is shown in Figure 1, below:

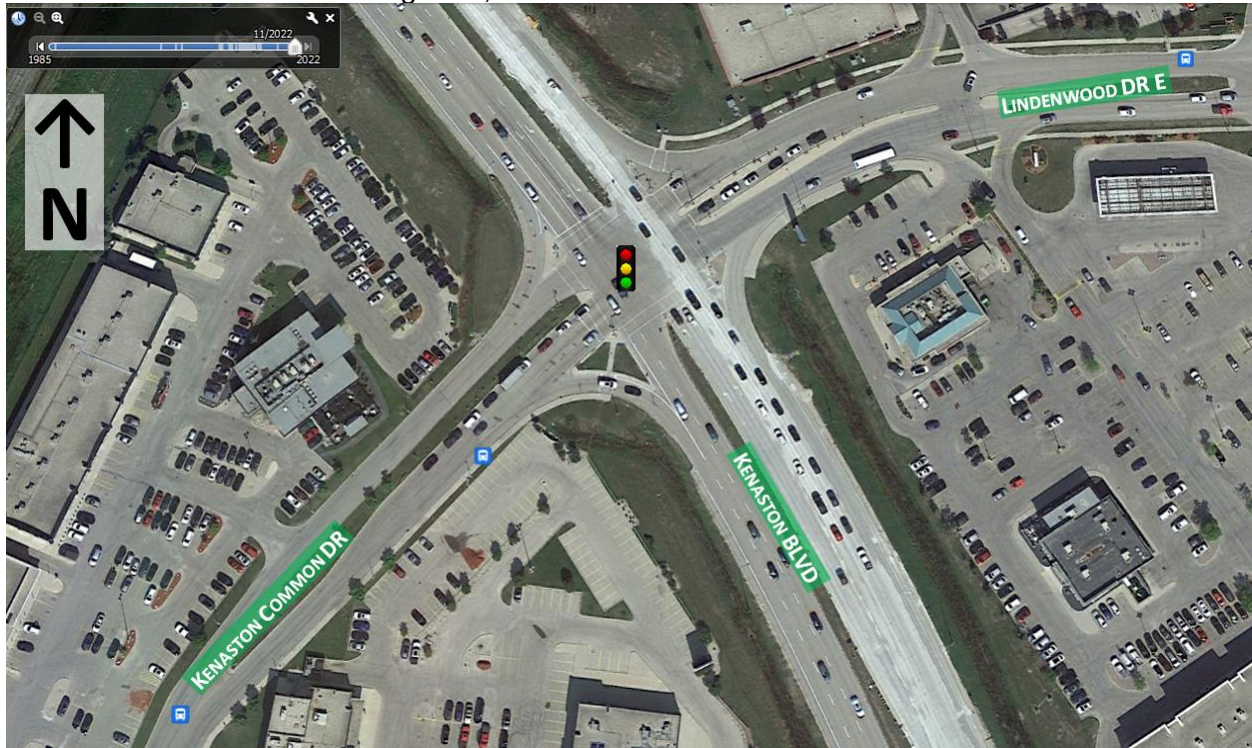


Figure 1: Kenaston Boulevard and Kenaston Common Drive / Lindenwood Drive E Intersection

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 Winnipeg 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; 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 48 vehicles per hour based on the upper-limit cycle length of 150 seconds.

To warrant installation of a separate left-turn phase at either of the intersections, the primary criterion of the Technical Guideline and Practice must be fulfilled: the left-turn demand must exceed two vehicles per signal cycle (48 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 (in the following order):

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 (amber and red signal display, does not include vehicles which are established in the intersection and complete the turn on the intergreen) exceeds 2.0 PCUs (Passenger Car Units).

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.

LEFT TURN ANALYSIS

Using the most recent intersection turning movement manual vehicle count at the intersection, a summary of the AM Peak Hour (between 07:00-09:00), PM Peak Hour (between 15:30-17:30), and other peak traffic hours is provided below:

THE CITY OF WINNIPEG				Manual Vehicle Count												Traffic Studies	
PUBLIC WORKS DEPARTMENT				Intersection Turning Movement													
	NORTHBOUND ON				SOUTHBOUND ON				EASTBOUND ON				WESTBOUND ON				TOTAL
	KENASTON BLVD				KENASTON BLVD				KENASTON COMMON DR				LINDENWOOD DR E				
	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:												7:30 - 8:30				
Hour		15	2,019	109		118	983	111		80	50	5		27	55	199	3,771
AM Peak	AM Peak Period is from:												7:00 - 9:00				
Period		29	3,668	196		235	1,862	241		146	100	10		59	117	355	7,018
Off-Peak	Highest Off-Peak Hour is from:												12:30 - 13:30				
Hour	1	104	1,354	112		290	1,096	275	1	231	181	53		135	165	250	4,248
Noon Peak	Highest Noon-Peak Hour (11:00 to 13:00) is from:												12:00 - 13:00				
Hour		102	1,347	139		271	1,096	261	1	236	182	37	1	139	161	268	4,241
PM Peak	PM Peak Hour (between 15:30 and 17:30), based on total volume, is from:												15:45 - 16:45				
Hour	9	119	1,543	126	1	274	1,738	319		152	202	76		110	204	297	5,170
PM Peak	PM Peak Period is from:												15:30 - 17:30				
Period	10	225	2,814	248	2	487	3,293	573		304	423	125		219	382	550	9,655

Figure 2: Summary of Kenaston Boulevard and Kenaston Common Drive / Lindenwood Drive E traffic study (April 2022)

During the four hours of the AM and PM Peak Periods, both the eastbound and westbound left-turn demand is greater than the 2.0 vehicles per cycle criterion; the primary criterion for eastbound and westbound left-turn phases is met.

The Winnipeg Public Service has reviewed the traffic operations modelling (Synchro) at the intersection. Several scenarios were reviewed for the AM, PM and weekend Peak Periods to analyze the level of service impacts of the proposed modifications. The scenarios included (but were not limited to):

- A. Existing/baseline (without left turn arrows).
- B. Protected-permissive eastbound left-turn arrow (with existing geometry).

C. Protected-only dual eastbound left-turn arrow using eastbound/westbound split phasing, and the existing geometry with modified eastbound lane designations on Kenaston Common Drive.

D. Protected-permissive eastbound and westbound left-turn arrows.

The review determined that the implementation of a protected-permissive eastbound left-turn signal phase would be beneficial, but has a negative impact to other movements at the intersection, notably the westbound direction from Lindenwood Drive E. To optimize the signal timing/phasing at the intersection, a westbound protected-permissive left-turn signal phase will also be installed to provide a more even balance of delays across all movements.

Allowing both northbound lanes on Kenaston Common Drive to turn left onto Kenaston Boulevard (eastbound left-turn) is not recommended. This would require modified lane designations at the eastbound approach to provide a dual eastbound left-turn (new lane designations: eastbound left only, shared eastbound left/through, and eastbound through only). This modification creates overlapping paths for opposing left turns and requires the use of split phasing to operate safely whereby eastbound and westbound are served separately. For all times of day, this option provides worse overall service to the intersection than the existing phasing structure. If this option were pursued it would likely require either removal of one of the crosswalks or an increase to the cycle lengths along Kenaston Boulevard to provide more flexibility with the timing plans.

Another benefit of the preferred option (protected-permissive eastbound and westbound left-turn phasing) is that it also allows turns to be made on the green ball display when opposing through volumes are low.

Installation of the left-turn signal phases can be implemented under the Winnipeg Public Service's authority.

COLLISION ANALYSIS

The City of Winnipeg network screening results use state-of-the-art road safety methodologies to effectively estimate the safety performance of intersections and to identify higher-risk sites within the regional street network. Network screening results are summarized and reported using level of safety service (LOSS) which assesses the collision history of a site compared to predicted collision history from other sites with similar characteristics. Sites are categorized from LOSS I (the safest) to LOSS IV (the least safe).

The Kenaston Boulevard and Lindenwood Drive E / Kenaston Common Drive intersection is categorized as LOSS III which indicates a moderate-to-high potential for collision reduction.

The most recent five-years (2016-2020) of reported collisions were reviewed. During this time there were 303 collision events reported (205 property damage only, 98 non-fatal injury collisions, and 0 fatal injury collisions). The following provides a summary of general collision trends at the intersection:

- Rear-end collisions were the most common configuration representing 65% (196 of 303) of the total collisions and 71% (70 of 98) of injury collisions. The directional distribution was:

- 72 southbound,
- 56 northbound,
- 15 westbound,
- 14 eastbound, and
- 39 unknown.

At least 42% of the total collisions at the intersection are northbound/southbound rear-end collisions.

- There were 14 of 303 collisions coded as involving a left-turn (left w/through and left turn (opposite direction)). The directional distribution was:
 - 7 westbound,
 - 3 eastbound,
 - 2 southbound,
 - 0 northbound, and
 - 2 unknown.

The implementation of eastbound/westbound left-turn arrows may be viewed as a collision countermeasure for correctable left-turn collisions.

FINANCIAL IMPACT

Financial Impact Statement

Date: November 22, 2022

Project Name: Traffic Study – Kenaston Common Drive and Kenaston Boulevard
First Year of Program 2023

	<u>2023</u>	<u>2024</u>	<u>2025</u>	<u>2026</u>	<u>2027</u>
Capital					
Capital Expenditures Required	\$ 21,000	\$ -	\$ -	\$ -	\$ -
Less: Existing Budgeted Costs	21,000	-	-	-	-
Additional Capital Budget Required	<u>\$ -</u>	<u>\$ -</u>	<u>\$ -</u>	<u>\$ -</u>	<u>\$ -</u>
Funding Sources:					
Debt - Internal	\$ -	\$ -	\$ -	\$ -	\$ -
Debt - External	-	-	-	-	-
Grants (Enter Description Here)	-	-	-	-	-
Reserves, Equity, Surplus	-	-	-	-	-
Other - Enter Description Here	-	-	-	-	-
Total Funding	<u>\$ -</u>	<u>\$ -</u>	<u>\$ -</u>	<u>\$ -</u>	<u>\$ -</u>
Total Additional Capital Budget Required	<u>\$ -</u>				
Total Additional Debt Required	<u>\$ -</u>				
Current Expenditures/Revenues					
Direct Costs	\$ -	\$ -	\$ -	\$ -	\$ -
Less: Incremental Revenue/Recovery	1,000	-	-	-	-
Net Cost/(Benefit)	<u>\$ (1,000)</u>	<u>\$ -</u>	<u>\$ -</u>	<u>\$ -</u>	<u>\$ -</u>
Less: Existing Budget Amounts	(1,000)	-	-	-	-
Net Budget Adjustment Required	<u>\$ -</u>	<u>\$ -</u>	<u>\$ -</u>	<u>\$ -</u>	<u>\$ -</u>
Additional Comments: Capital Costs represent the class 3 estimated cost to install the left-turn signal phases \$20,000 as described in the report, including overhead charges of \$1,000 to be charged to the TEIP capital program. Incremental Revenue/Recovery represent Departmental overheads and Corporate Interest charges to be recovered.					

J. Ruby, 2022-12-07

J. Ruby CPA, CA
 Manager of Finance and Administration

CONSULTATION

This Report has been prepared in consultation with: N/A

OURWINNIPEG POLICY ALIGNMENT

This report is in accordance with OurWinnipeg2045 as per:

- **Policy 4.10 Transportation Safety:** Design, construct, maintain, and regulate an integrated and sustainable transportation system and related infrastructure that optimize safe, connected and reliable mobility, and minimize severe injuries and fatalities for all road users.

WINNIPEG CLIMATE ACTION PLAN ALIGNMENT

There is a linkage between making Winnipeg's transportation network safer and more efficient with Key Directions 3.1 "Increase Use and Efficiency of Public Transit Systems", 3.4 "Increase Active Transportation Rates", and 3.5 "Reduce Traffic Congestion".

WINNIPEG POVERTY REDUCTION STRATEGY ALIGNMENT

N/A

SUBMITTED BY

Department: Public Works
Division: Transportation
Prepared by: T. Jangula, C.E.T., Traffic Analyst
G. Blatz, P.Eng., Traffic Management Engineer
Date: December 9, 2022