THE CITY OF WINDSOR
ONTARIO, CANADA

INTER-OFFICE MEMO

TO: **Mayor and Members of Council**

FROM: **Jeff Hagan, Transportation Planning Senior Engineer**

DATE: **November 17, 2020**

SUBJECT: **Results of Traffic Analysis**

Wyandotte Street East Corridor Review

Introduction

Wyandotte Street East has been identified as a candidate for reduction of through lanes to accommodate bicycle lanes along Wyandotte Street. To determine whether this lane reduction is feasible, a corridor review was carried out using *Synchro 10* traffic analysis software.

Existing Lane Configurations are shown in Figure 1 (following the body of the memo). Lane configurations with lane reductions are shown in Figure 2.

Traffic Volumes

Existing traffic volumes used for analysis were obtained from recent traffic counts at intersections along the corridor, adjusted to reflect a common 2020 horizon year.

Traffic growth forecasts for future conditions were based on the following assumptions:

- **Diversion from Riverside Drive:** as a result of traffic calming measures included in the Riverside Drive Vista Improvement Project, 20% of traffic travelling Riverside Drive between Walker Road and Lauzon Road was assumed to divert to Wyandotte Street.
- **Background Growth:** an annual traffic growth rate of 0.5% per year was assumed. This rate is in line with recent historical trends, and reflects a moderate degree of intensification in the area as well as a moderate amount of build-out of the undeveloped lands along Wyandotte Street East to the east of the study area.
- **Mode Share:** non-auto (cyclist, transit, pedestrian) mode share was assumed as follows:
    - **2020 Existing:** 8.3% non-auto mode share (as per the Active Transportation Master Plan – mature neighbourhoods)
    - **2040 Ultimate:** 22% non-auto mode share (as per the Active Transportation Master Plan – mature neighbourhoods)
    - **2030 Interim:** 17.4% non-auto mode share
    - **Scenarios where an east-west Regional Spine cycling facility is not provided:** 8.3% non-auto mode share (i.e. existing status quo)

Analysis Results

Analysis was carried out using the *Highway Capacity Manual* methodology for evaluating urban streets as implemented in the *Synchro 10* software package.

Using this methodology, Wyandotte Street East is a Class III Arterial based on the characteristics of the street. Level of Service ranges for a Class III Arterial are summarized in Table 1.

Table 1: Level of Service Descriptions (Source: Highway Capacity Manual)

Level of Service	Average Travel Speed	Description
A	> 50 km/h	Free flow, traffic stream is unrestricted
B	> 39 – 50 km/h	Reasonably free flow, traffic stream slightly restricted
C	> 28 – 39 km/h	Stable flow, freedom to maneuver is noticeably restricted
D	> 22 – 28 km/h	Approaching unstable flow, freedom to maneuver is more limited
E	> 17 – 22 km/h	Unstable flow, operating at capacity
F	≤ 17 km/h	Forced or breakdown flow

2020 Arterial Operations

2020 arterial operations are summarized in Table 2 and Table 3. In all results tables, colour coding is based on speed:

- green: free flow (50 km/h)
- red: stopped (0 km/h)

In the weekday AM peak hour under existing conditions, the arterial performance of Wyandotte Street East in the peak direction (westbound) was satisfactory overall, though with marginal conditions at isolated points (approaching Lauzon Road, approaching Pillette Road, and from approaching Walker Road into Walkerville, i.e. through Devonshire Rd.).

In the weekday PM peak hour under existing conditions, the arterial performance of Wyandotte Street East in the peak direction (eastbound) was satisfactory - though approaching marginal conditions - overall. Poor operations were noted through Walkerville (i.e. Devonshire Rd. through Walker Rd.), and marginal operations were noted approaching the lane drop at Watson Ave.

With the addition of traffic diverted from Riverside Drive (and no changes to signal timings), the overall travel time along the corridor increases, but the overall level of service does not change from existing conditions (weekday AM: LOS C; weekday PM: LOS D). In the weekday AM peak hour, approaching Pillette Road, operations degrade from marginal (LOS E) to poor (LOS) and from satisfactory (LOS D) to marginal (LOS E) approaching Watson Road. In the weekday PM peak hour, the level of service for individual approaches did not change.

Optimizing intersection splits at intersections with critical movements will address some, but not all, of the issues noted in existing conditions or that are exacerbated with the diversion of traffic from Riverside Drive. In the weekday AM peak hour, these signal timing adjustments improved operations to the point that the total travel time along the corridor was equal to that of existing operations. In the weekday PM peak period splits improve total travel time somewhat, but overall travel time through the corridor is still somewhat higher than for existing conditions.

With the reduction of lanes to allow for cycling facilities along the corridor (and re-optimization of intersection splits), arterial operations for motor vehicles are worsened. In the weekday AM peak hour, overall operations are marginal (LOS E) with marginal or poor (LOS E/F) operations for certain segments. In the weekday PM peak hour, overall operations are poor (LOS F) with marginal or poor (LOS E/F) operations for most segments.

Table 2: 2020 Weekday AM Peak Hour Arterial Level of Service - Wyandotte Street East Peak Direction (Westbound)

Scenario	**2020 Existing**				**2020 with Diversion**				**2020 with Diversion & Lane Reductions**			
Description	Volumes: existing Lane Configurations: existing Signal Timings: existing				Volumes: existing plus diversion from Riverside Drive, existing mode split Lane Configurations: existing Signal Timings: splits optimized at intersections with critical movements				Volumes: existing plus diversion from Riverside Drive, existing mode split Lane Configurations: lanes reduced to accommodate bike facility Signal Timings: splits optimized at intersections with critical movements			
Cross Street	Travel Time (s)	Dist (km)	Arterial Speed (km/h)	Arterial Level of Service	Travel Time (s)	Dist (km)	Arterial Speed (km/h)	Arterial Level of Service	Travel Time (s)	Dist (km)	Arterial Speed (km/h)	Arterial Level of Service
Watson Ave	23.7	0.17	25.2	D	25.7	0.17	23.3	D	25.8	0.17	23.2	D
Lauzon Rd	51.6	0.29	20.6	E	53.9	0.29	19.7	E	68.4	0.29	15.5	F
St. Rose Ave	78.8	0.92	41.9	B	81.0	0.92	40.8	B	103.7	0.92	31.8	C
Jefferson Blvd	66.8	0.80	43.1	B	66.8	0.80	43.1	B	78.1	0.80	36.9	C
St. Louis Ave	34.4	0.38	40.0	B	34.6	0.38	39.8	B	70.1	0.38	19.6	E
Thompson Blvd	24.8	0.25	36.1	C	25.4	0.25	35.2	C	117.9	0.25	7.6	F
Raymo Rd	49.1	0.52	37.9	C	49.7	0.52	37.4	C	102.5	0.52	18.1	E
Pillette Rd	44.0	0.24	19.7	E	43.6	0.24	19.9	E	202.8	0.24	4.3	F
George Ave	55.8	0.66	42.3	B	57.8	0.66	40.8	B	61.7	0.66	38.2	C
Strabane Ave	49.2	0.54	39.8	B	51.1	0.54	38.3	C	49.8	0.54	39.3	B
Drouillard Rd	60.1	0.62	37.1	C	60.3	0.62	36.9	C	127.1	0.62	17.5	E
Walker Rd	94.4	0.55	20.8	E	71.6	0.55	27.5	D	72.0	0.55	27.3	D
Monmouth Rd	18.4	0.12	23.9	D	21.7	0.12	20.3	E	22.4	0.12	19.7	E
Devonshire Rd	34.3	0.22	23.1	D	41.6	0.22	19.0	E	50.9	0.22	15.6	F
Total	**685.4**	**6.27**	**33.0**	**C**	**684.8**	**6.27**	**33.0**	**C**	**1153.2**	**6.27**	**19.6**	**E**

Table 3: 2020 Weekday PM Peak Hour Arterial Level of Service - Wyandotte Street East Peak Direction (Eastbound)

Scenario	**2020 Existing**				**2020 with Diversion**				**2020 with Diversion & Lane Reductions**			
Description	Volumes: existing Lane Configurations: existing Signal Timings: existing				Volumes: existing plus diversion from Riverside Drive, existing mode split Lane Configurations: existing Signal Timings: splits optimized at intersections with critical movements				Volumes: existing plus diversion from Riverside Drive, existing mode split Lane Configurations: lanes reduced to accommodate bike facility Signal Timings: splits optimized at intersections with critical movements			
Cross Street	Travel Time (s)	Dist (km)	Arterial Speed (km/h)	Arterial Level of Service	Travel Time (s)	Dist (km)	Arterial Speed (km/h)	Arterial Level of Service	Travel Time (s)	Dist (km)	Arterial Speed (km/h)	Arterial Level of Service
Devonshire Rd	172.7	0.19	3.9	F	281.8	0.19	2.4	F	239.2	0.19	2.8	F
Monmouth Rd	38.1	0.22	20.8	E	37.3	0.22	21.2	E	37.3	0.22	21.2	E
Walker Rd	41.2	0.12	10.7	F	36.1	0.12	12.2	F	35.8	0.12	12.3	F
Drouillard Rd	55.5	0.55	35.4	C	56.6	0.55	34.8	C	109.6	0.55	17.9	E
Strabane Ave	51.0	0.62	43.7	B	51.3	0.62	43.4	B	99.0	0.62	22.5	D
George Ave	47.4	0.54	41.3	B	47.3	0.54	41.4	B	87.8	0.54	22.3	E
Pillette Rd	70.3	0.66	33.6	C	74.7	0.66	31.6	C	309.3	0.66	7.6	F
Raymo Rd	25.9	0.24	33.4	C	26.1	0.24	33.2	C	37.1	0.24	23.3	D
Thompson Blvd	44.7	0.52	41.6	B	44.9	0.52	41.4	B	161.5	0.52	11.5	F
St. Louis Ave	24.2	0.25	37.0	C	24.4	0.25	36.7	C	54.9	0.25	16.3	E
Jefferson Blvd	32.6	0.38	42.2	B	32.9	0.38	41.9	B	49.5	0.38	27.8	D
St. Rose Ave	68.8	0.80	41.9	B	68.9	0.80	41.8	B	189.3	0.80	15.2	F
Lauzon Rd	95.0	0.92	34.8	C	105.7	0.92	31.2	C	195.9	0.92	16.9	E
Watson Ave	48.3	0.29	22.0	E	55.1	0.29	19.2	E	49.0	0.29	21.6	E
Total	**815.7**	**6.30**	**27.8**	**D**	**943.1**	**6.30**	**24.0**	**D**	**1655.2**	**6.30**	**13.7**	**F**

2030 Arterial Operations

2030 arterial operations are summarized in Table 4 and Table 5.

With existing lane configurations, by 2030, overall weekday AM peak hour operations remain satisfactory (LOS C) with marginal (LOS E) operations on certain segments. In the weekday PM peak hour, overall operations will degrade from satisfactory in 2020 (LOS D) to marginal in 2030 (LOS E) with several segments experiencing marginal or poor operations (LOS E/F).

Operations with reduced lane widths are improved in 2030 compared to 2020, since the increased non-auto mode split outweighs the effect of background growth in motor vehicle volumes. However, certain segments along the corridor remain operating marginally (LOS E) or poorly (LOS F) in both the weekday AM and PM peak hours.

Table 4: 2030 Weekday AM Peak Hour Arterial Level of Service - Wyandotte Street East Peak Direction (Westbound)

Scenario	**2030 with Diversion**				**2030 with Diversion & Lane Reductions**			
Description	Volumes: background plus diversion from Riverside Drive, existing mode split Lane Configurations: existing Signal Timings: splits optimized at intersections with critical movements				Volumes: existing plus diversion from Riverside Drive, existing mode split Lane Configurations: lanes reduced to accommodate bike facility Signal Timings: splits optimized at intersections with critical movements			
Cross Street	Travel Time (s)	Dist (km)	Arterial Speed (km/h)	Arterial Level of Service	Travel Time (s)	Dist (km)	Arterial Speed (km/h)	Arterial Level of Service
Watson Ave	25.8	0.17	23.2	D	24.0	0.17	24.9	D
Lauzon Rd	54.5	0.29	19.5	E	55.9	0.29	19.0	E
St. Rose Ave	80.9	0.92	40.8	B	94.3	0.92	35.0	C
Jefferson Blvd	66.8	0.80	43.1	B	74.9	0.80	38.5	B
St. Louis Ave	34.7	0.38	39.7	B	53.4	0.38	25.8	D
Thompson Blvd	25.5	0.25	35.1	C	73.1	0.25	12.2	F
Raymo Rd	49.8	0.52	37.3	C	57.5	0.52	32.3	C
Pillette Rd	43.4	0.24	19.9	E	127.3	0.24	6.8	F
George Ave	57.8	0.66	40.8	B	61.4	0.66	38.4	B
Strabane Ave	51.4	0.54	38.1	C	49.4	0.54	39.6	B
Drouillard Rd	60.3	0.62	36.9	C	96.8	0.62	23.0	D
Walker Rd	73.3	0.55	26.8	D	71.7	0.55	27.4	D
Monmouth Rd	20.2	0.12	21.8	E	20.6	0.12	21.4	E
Devonshire Rd	42.9	0.22	18.5	E	39.9	0.22	19.8	E
Total	**687.3**	**6.27**	**32.9**	**C**	**900.2**	**6.27**	**25.1**	**D**

Table 5: 2030 Weekday PM Peak Hour Arterial Level of Service - Wyandotte Street East Peak Direction (Eastbound)

Scenario	**2030 with Diversion**				**2030 with Diversion & Lane Reductions**			
Description	Volumes: 2030 background plus diversion from Riverside Drive, existing mode split Lane Configurations: existing Signal Timings: splits optimized at intersections with critical movements				Volumes: 2030 background plus diversion from Riverside Drive, ATMP target mode split Lane Configurations: lanes reduced to accommodate bike facility Signal Timings: splits optimized at intersections with critical movements			
Cross Street	Travel Time (s)	Dist (km)	Arterial Speed (km/h)	Arterial Level of Service	Travel Time (s)	Dist (km)	Arterial Speed (km/h)	Arterial Level of Service
Devonshire Rd	349.6	0.19	1.9	F	210.4	0.19	3.2	F
Monmouth Rd	40.8	0.22	19.4	E	32.5	0.22	24.4	D
Walker Rd	80.9	0.12	5.4	F	32.1	0.12	13.7	F
Drouillard Rd	57.3	0.55	34.3	C	88.3	0.55	22.3	E
Strabane Ave	51.5	0.62	43.3	B	71.1	0.62	31.3	C
George Ave	47.3	0.54	41.4	B	59.0	0.54	33.2	C
Pillette Rd	76.7	0.66	30.8	C	269.9	0.66	8.7	F
Raymo Rd	26.3	0.24	32.9	C	34.4	0.24	25.2	D
Thompson Blvd	45.4	0.52	41.0	B	127.6	0.52	14.6	F
St. Louis Ave	24.7	0.25	36.2	C	33.6	0.25	26.6	D
Jefferson Blvd	33.8	0.38	40.7	B	48.2	0.38	28.6	D
St. Rose Ave	69.3	0.80	41.6	B	151.3	0.80	19.0	E
Lauzon Rd	105.5	0.92	31.3	C	163.5	0.92	20.2	E
Watson Ave	57.6	0.29	18.4	E	45.6	0.29	23.3	D
Total	**1066.7**	**6.30**	**21.2**	**E**	**1367.5**	**6.30**	**16.6**	**E**

2040 Arterial Level of Service

2040 arterial level of service operations are summarized in Table 6 and Table 7.

With existing lane configurations, 2040 overall operations are satisfactory (LOS C) in the weekday AM peak hour and marginal (LOS E) in the weekday PM peak hour. Certain individual segments in both peak hours experience marginal (LOS E) or poor (LOS F) operations, with operations in these segments generally worse than in 2030.

With reduced motor vehicle lanes to accommodate bicycle facilities, operations in 2040 have degraded significantly compared to 2030. Overall level of service for the corridor in 2040 is satisfactory (LOS D) in the weekday PM peak hour and marginal (LOS E) in the weekday PM peak hour. Certain segments in both peak hours operate marginally (LOS E) or poorly (LOS F).

Table 6: 2040 Weekday AM Peak Hour Arterial Level of Service - Wyandotte Street East Peak Direction (Westbound)

Scenario	**2040 with Diversion**				**2040 with Diversion & Lane Reductions**			
Description	Volumes: 2040 background plus diversion from Riverside Drive, existing mode split Lane Configurations: existing Signal Timings: splits optimized at intersections with critical movements				Volumes: 2040 background plus diversion from Riverside Drive, ATMP target mode split Lane Configurations: lanes reduced to accommodate bike facility Signal Timings: splits optimized at intersections with critical movements			
Cross Street	Travel Time (s)	Dist (km)	Arterial Speed [km/h]	Arterial Level of Service	Travel Time (s)	Dist (km)	Arterial Speed [km/h]	Arterial Level of Service
Watson Ave	26.4	0.17	22.6	D	23.7	0.17	25.2	D
Lauzon Rd	55.7	0.29	19.0	E	55.6	0.29	19.1	E
St. Rose Ave	81.1	0.92	40.7	B	93.4	0.92	35.4	C
Jefferson Blvd	67.0	0.80	43.0	B	74.7	0.80	38.6	B
St. Louis Ave	35.0	0.38	39.3	B	52.3	0.38	26.3	D
Thompson Blvd	26.1	0.25	34.3	C	68.8	0.25	13.0	F
Raymo Rd	50.2	0.52	37.0	C	57.1	0.52	32.6	C
Pillette Rd	54.9	0.24	15.8	F	122.8	0.24	7.1	F
George Ave	57.9	0.66	40.8	B	61.6	0.66	38.3	C
Strabane Ave	51.9	0.54	37.7	C	49.4	0.54	39.6	B
Drouillard Rd	60.8	0.62	36.6	C	94.7	0.62	23.5	D
Walker Rd	76.7	0.55	25.6	D	71.7	0.55	27.4	D
Monmouth Rd	20.7	0.12	21.3	E	20.0	0.12	22.0	E
Devonshire Rd	49.1	0.22	16.1	E	39.3	0.22	20.2	E
Total	**713.5**	**6.27**	**31.7**	**C**	**885.1**	**6.27**	**25.5**	**D**

Table 7: 2040 Weekday PM Peak Hour Arterial Level of Service - Wyandotte Street East Peak Direction (Eastbound)

Scenario	**2040 with Diversion**				**2040 with Diversion & Lane Reductions**			
Description	Volumes: existing plus diversion from Riverside Drive, existing mode split Lane Configurations: existing Signal Timings: splits optimized at intersections with critical movements				Volumes: 2040 background plus diversion from Riverside Drive, ATMP target mode split Lane Configurations: lanes reduced to accommodate bike facility Signal Timings: splits optimized at intersections with critical movements			
Cross Street	Travel Time (s)	Dist (km)	Arterial Speed (km/h)	Arterial Level of Service	Travel Time (s)	Dist (km)	Arterial Speed (km/h)	Arterial Level of Service
Devonshire Rd	379.1	0.19	1.8	F	210.4	0.19	3.2	F
Monmouth Rd	37.3	0.22	21.2	E	32.5	0.22	24.4	D
Walker Rd	68.9	0.12	6.4	F	32.1	0.12	13.7	F
Drouillard Rd	58.1	0.55	33.9	C	88.3	0.55	22.3	E
Strabane Ave	51.8	0.62	43.0	B	71.1	0.62	31.3	C
George Ave	47.3	0.54	41.4	B	59.0	0.54	33.2	C
Pillette Rd	84.8	0.66	27.8	D	269.9	0.66	8.7	F
Raymo Rd	26.6	0.24	32.5	C	34.4	0.24	25.2	D
Thompson Blvd	46.1	0.52	40.3	B	127.6	0.52	14.6	F
St. Louis Ave	25.1	0.25	35.7	C	33.6	0.25	26.6	D
Jefferson Blvd	34.6	0.38	39.8	B	48.2	0.38	28.6	D
St. Rose Ave	69.8	0.80	41.3	B	151.3	0.80	19.0	E
Lauzon Rd	107.8	0.92	30.6	C	163.5	0.92	20.2	E
Watson Ave	59.2	0.29	17.9	E	45.6	0.29	23.3	D
Total	**1096.5**	**6.30**	**20.7**	**E**	**1367.5**	**6.30**	**16.6**	**E**

Conclusions

Overall, lane reductions to accommodate bike facilities will increase travel times in the weekday AM and PM peak hours for the Wyandotte Street East corridor, causing some segments to operate poorly.

Even with existing lane configurations, operations are already marginal or poor for certain segments, especially in the weekday PM peak hour. Vehicle travel times are expected to increase in these segments over time, due to traffic diversion from Riverside Drive as well as general background traffic growth.

Figure 1: Existing Lane Configuration

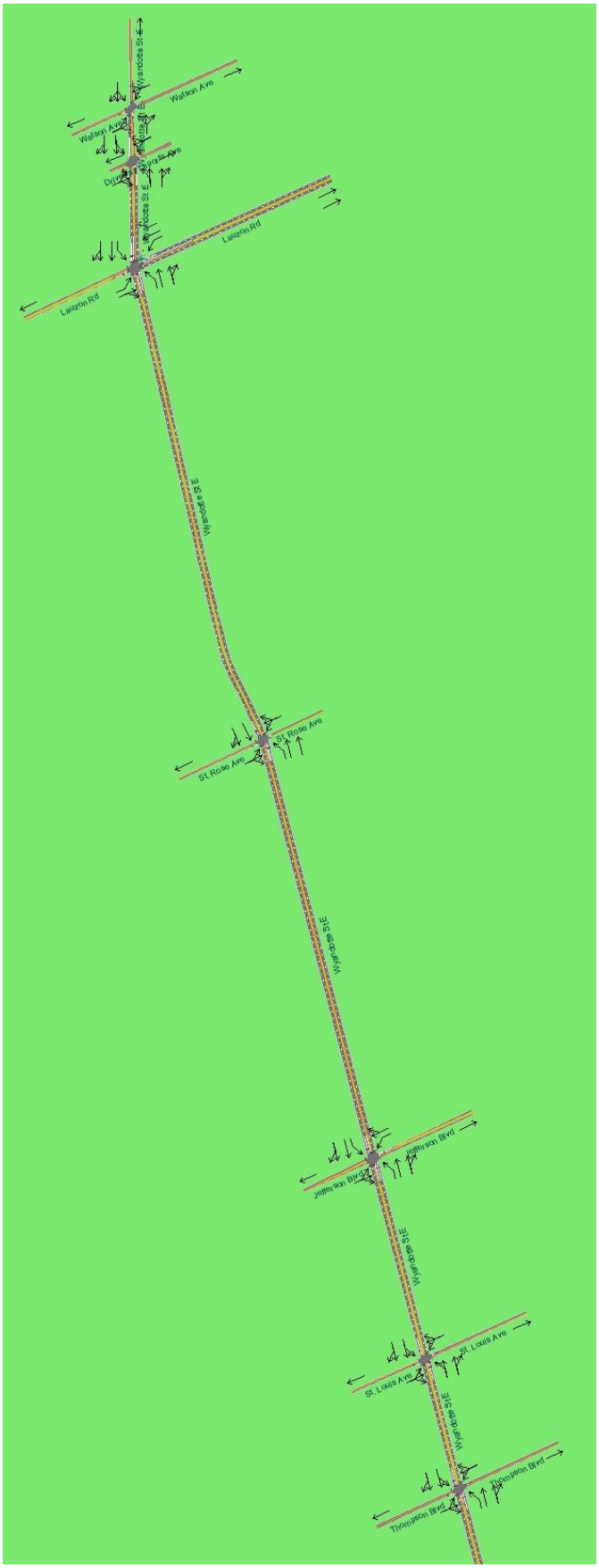

Figure 2: Lane Configuration with Reduced Through Lanes for Bicycle Facility