

Attachment 3

Summary Analysis of Network Options to Donald Cousens Parkway Extension

Overview of analysis approach

The major road network in north Markham is planned for expansion through the York Region Transportation Master Plan and Council-endorsed Future Urban Area Conceptual Master Plan. Both plans included a conceptual extension of Donald Cousens Parkway (DCP) west of Highway 48 to connect with Highway 404 at 19th Avenue.

As the key objective is to determine whether the extension of the DCP is necessary, network alternatives with and without the DCP extension are developed and tested against a 2041 travel demand forecast. Starting with a baseline road network, alternative road networks developed are described below.

Baseline road network defined based on published and endorsed plans

- a. Elgin Mills Road at four-lanes, from Woodbine Avenue to Highway 48 per the York Region Transportation Master Plan 2016 (York Region TMP) and the recommendation of the Markham Future Urban Area Conceptual Master Plan (as endorsed by Markham Council in October 2017).
- b. Future Highway 404 interchange at 19th Avenue and 19th Avenue at four-lanes from Leslie Street to Warden Avenue. The York Region TMP identifies the need for a future Highway 404 interchange at 19th Avenue to accommodate growth in Markham and Richmond Hill. The new interchange will include the four-lane widening of 19th Avenue from Leslie Street to Warden Avenue.
- c. North Markham Area Collector Road Network per the recommendation of the Markham Council endorsed Future Urban Area Conceptual Master Plan.
- d. Warden Avenue at four-lanes from Major Mackenzie Drive East to 19th Avenue per the York Region TMP.
- e. Kennedy Road at four-lanes from Major Mackenzie Drive East to Elgin Mills Road per York Region's TMP and 10-Year Roads and Transit Capital Construction Plan.
- f. Major Mackenzie Drive at six-lanes to accommodate HOV/transit lanes per York Region TMP between Yonge Street and Kennedy Road.

Four alternative networks developed for testing

In the baseline network, the higher east-west traffic capacity available in North Markham between Highway 404 and Warden Avenue is reduced as 19th Avenue returns to two-lanes east of Warden Avenue. Additions are made to the baseline network to represent alternative network scenarios with and without the Donald Cousens Parkway extension, with the objective of providing sufficient east-west traffic capacity east of Warden Avenue to meet 2041 travel demand. Summarized in **Table 1**, these alternative networks are illustrated in **Appendix A**.

Table 1 – Alternative Networks

Alternative	Baseline Network in all Alternatives (as described in bullets a - f above)	DCP Extension included	19 th Ave widening east of Warden Ave included
1 (Baseline network)	Elgin Mills Rd. widened to four lanes from Woodbine Ave. to Highway 48 19 th Ave. widened to four lanes from Leslie St. to Warden Ave including a Hwy 404 Interchange.	No	No
2	Future Urban Area Collector road system.	From Hwy 404 to Hwy 48	No
3	Warden Ave. widened to four lanes from Major Mackenzie Dr. E. to 19 th Ave. Kennedy Rd. widened to four lanes from Major Mackenzie Dr. E. to Elgin Mills Rd.	No	From Warden Ave to Kennedy Ave
4	Major Mackenzie Dr. E. widened to include HOV/transit lane between Yonge Street and Kennedy Road.	From Hwy 404 to Kennedy Rd	No

Overall:

- Alternative 1 is the baseline alternative with the above noted baseline transportation network described in bullets (a) to (f).
- Alternative 2: baseline alternative (Alt. #1) plus the full DCP extension from Highway 48 to Highway 404/19th Avenue interchange.
- Alternative 3: baseline alternative (Alt. #1) plus widening of 19th Avenue from Warden Avenue to Kennedy Avenue. No DCP extension.
- Alternative 4: baseline alternative (Alt. #1) plus a segmented DCP extension from Kennedy Road to Highway 404/19th Avenue Interchange.

2041 growth and travel demand scenario used for testing the alternative networks

This study adopted the 2041 growth scenario used in the 2016 York Region TMP as the basis for developing future travel demand for testing the effectiveness of alternative networks.

Alternative networks tested against 2041 travel demand forecast

York Region developed traffic forecasts for each network alternative using the York Region AM peak period travel demand forecasting model.

The projected traffic levels of service (volume to capacity ratio) for the alternative networks are summarized for the overall E-W and N-S movements in north Markham at different locations in the road network as tabulated in Table 2 and Table 3.

Table 2 – Total Directional Northbound/Southbound Volume/Capacity Ratio

	Alternative Network, v/c (volume/capacity ratio)							
	Alt 1		Alt 2		Alt 3		Alt 4	
Location	NB	SB	NB	SB	NB	SB	NB	SB
1 – b/t 19 th and Elgin Mills	0.39	0.83	0.30	0.84	0.39	0.83	0.28	0.79
2 – b/t Elgin Mills and Major Mackenzie	0.38	0.63	0.33	0.63	0.38	0.63	0.38	0.64

Table 3 – Total Directional Eastbound/Westbound Volume/Capacity Ratio

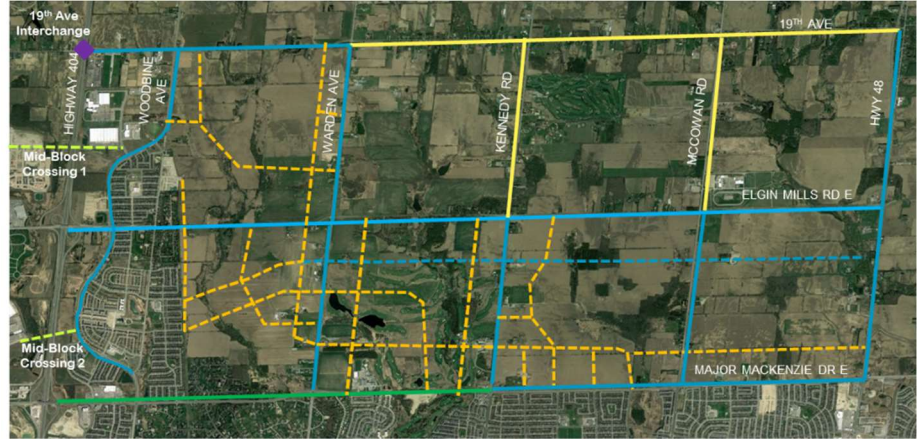
	Alternative Network, v/c (volume/capacity ratio)							
	Alt 1		Alt 2		Alt 3		Alt 4	
Location	EB	WB	EB	WB	EB	WB	EB	WB
3 – b/t Highway 404 and Woodbine	0.63	0.62	0.63	0.65	0.62	0.63	0.63	0.64
4 – b/t Woodbine and Warden	0.42	0.82	0.44	0.88	0.43	0.83	0.51	0.77
5 – b/t Warden And Kennedy	0.42	0.93	0.38	0.85	0.39	0.88	0.36	0.82
6 – b/t Kennedy and McCowan	0.40	0.78	0.37	0.77	0.41	0.83	0.40	0.83
7 – b/t McCowan and Highway 48	0.37	0.57	0.33	0.56	0.37	0.58	0.37	0.58

All network alternatives are able to accommodate 2041 travel demand

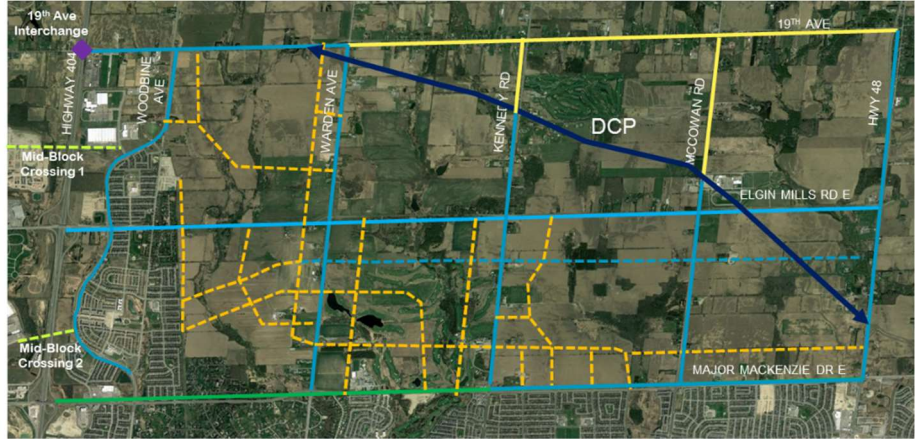
The results in Table 2 and Table 3 indicate that the 2041 forecast travel demand can be accommodated by all network alternatives, including the baseline network.

Appendix A – Alternative Road Networks for Testing

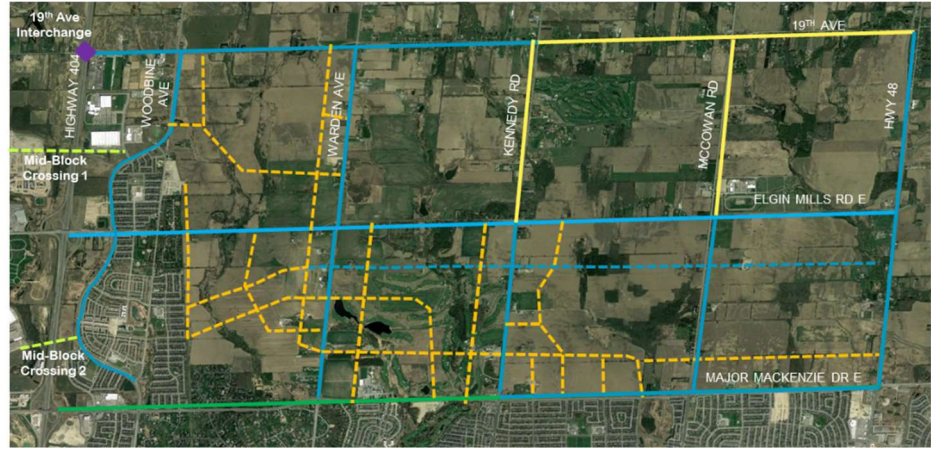
Alternative 1 – Baseline network (2041)



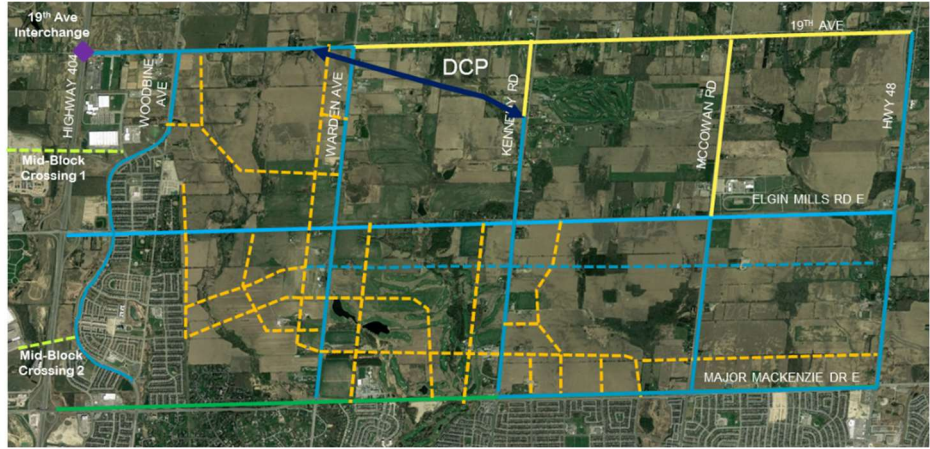
Alternative 2 – Baseline plus full Donald Cousens Parkway extension



Alternative 3 – Baseline plus 4-lane 19th Ave to Warden Ave



Alternative 4 – Baseline plus partial Donald Cousens Parkway extension



LEGEND:	2-lane road	-----	-----
	4-lane road	-----	-----
	4-lane road plus HOV lanes	-----	-----