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TO: Rob Hunton, P.Eng.
FROM: Ian Borsuk, P.Eng
DATE: March 10, 2011
CC: Don Stephens, P.Eng., Tim Dickinson
OUR FILE: 7499 West Transitway (Bayshore to Moodie)
SUBJECT: Review of Moodie Drive/Highway 417 At-Grade Transitway Phasing Strategy based on Revised Growth Projection

The purpose of this memo is to review the recommended phasing strategy for the Transitway at Moodie Drive (i.e. at-grade intersection in near term; partial grade-separation for WB buses in interim). This review was requested by the City following the recent information regarding the future potential use of the former Nortel Facility as a federal employment centre.

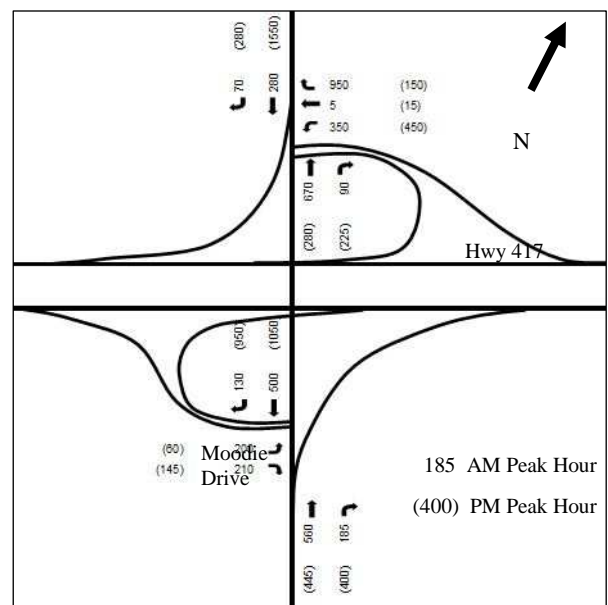
Historic and Existing Conditions

The assessment undertaken by MRC in July 2010 established the existing traffic operations on Moodie Drive at Highway 417 between the years of 2002 and 2010. During this period, the number of employees at the Nortel Facility varied considerably with a noted reduction in 2009/2010. Prior to 2009, employment estimates for the Nortel Facility were approximately 4,000 to 6,000. By 2010, employment levels fell to approximately 2,000 employees.

Additional traffic data has been collected since the July 2010 traffic analysis, and has confirmed the base year traffic flows at the area intersections. The existing 2010 traffic volumes for the Moodie Drive and Highway 417 intersections (North and South) are shown in Exhibit 1.

The current level of service offered at the Moodie Drive and Highway 417 ramps during the AM and PM peak hours is highlighted in Table 1. The analysis indicates that each signalized intersection generally provides good levels of service. The levels of service reported were "D" or better with only the southbound through traffic movement (SBT) on Moodie Drive at the Westbound Highway 417 ramp intersection operating at LOS of "D" during the PM peak hour). The volume to capacity (v/c) ratio for this movement is noted at 0.84.

Exhibit 1 - Existing Traffic Volumes at Moodie Drive & Highway 417



**Table 1 – Existing Intersection Operations (AM Peak Hour)**

Intersection	AM Peak Hour		PM Peak Hour		
	v/c	LOS	v/c	LOS	
Highway 417 EB Ramp	EBL	0.63	B	0.25	A
	EBR	0.46	A	0.51	A
	NBT	0.29	A	0.20	A
	NBR	0.20	A	0.37	A
	SBT	0.26	A	0.49	A
	SBR	0.14	A	0.77	C
	Highway 417 WB Ramp	WBL	0.72	C	0.75
WBR		0.75	C	0.12	A
NBT		0.34	A	0.15	A
NBR		0.10	A	0.26	A
SBT		0.14	A	0.84	D
SBR		0.08	A	0.32	A

**Previous Traffic Analysis (July 2010) and Assessment of Alternatives**

An Environmental Assessment study of the proposed expansion of the former Nortel Carling Campus was completed in 1997 and identified a potential for up to 8,000 employees to be located at the site. In addition, the City’s long term employment projection which was included in the City’s transportation demand forecast was approximately 7,200 for the 2031 planning horizon, with approximately 6,200 employees for the interim 2021 planning horizon at the former Nortel site.

The traffic assessment completed by MRC in July 2010 focused on a number of phasing alternatives for the extension of Transitway services through the study area and identified intersection levels of service for the 2021 planning horizon. This analysis considered existing traffic volumes (prior to the reduction in employment observed in 2009) as the base condition to which future traffic growth was added. While this conservative approach was appropriate to forecast traffic conditions for 2021 and 2031, an assessment was also carried out to identify the implications that each alternative would have on the observed 2010 traffic volumes. The analysis undertaken explored three alternatives at Moodie Drive for connecting to the Transitway, each with varying levels of transit exclusivity.

1. At-grade intersection of the Transitway at Moodie Drive
2. Partially grade-separated (grade-separated westbound, at-grade eastbound)
3. Fully grade-separated

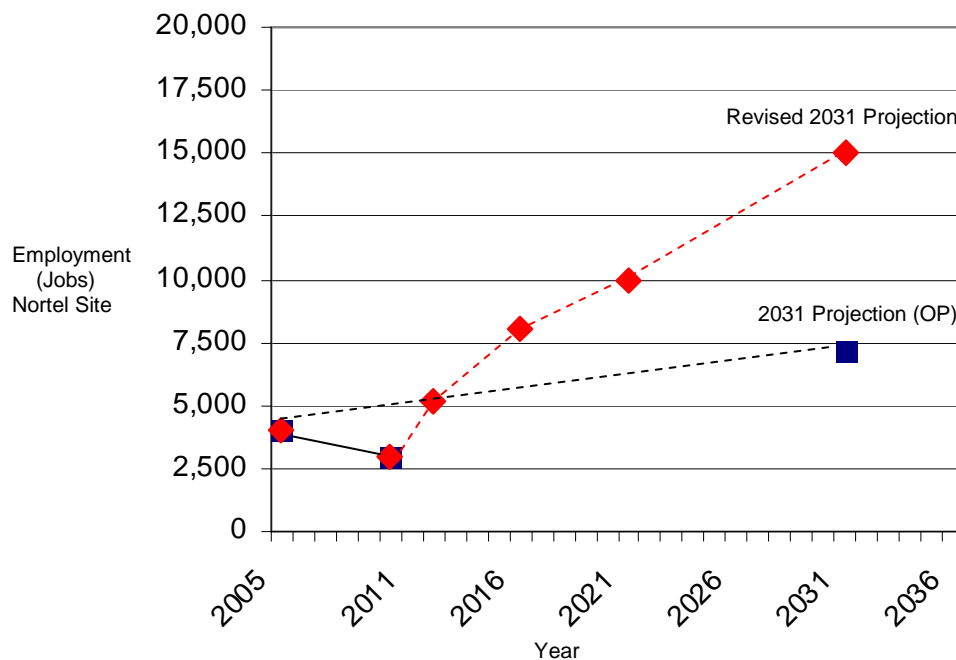
The assessment of the at-grade alternative indicated that transit operations would be adequately accommodated for the near-term planning horizon. However, the analysis also indicated that by the year 2021, traffic operations associated with an at-grade intersection reached capacity, at which point additional transit exclusivity would be required to improve transit services. The partially grade-separated alternative would then be required as an interim improvement, until such time as the Transitway was extended to Kanata and the fully grade-separated alternative

was built. This finding was based on the City's long-term employment projection (Official Plan). The traffic review which follows assesses the implication of the revised employment projections on the at-grade Transitway option at Moodie Drive.

### **Revised Employment Projections (Nortel Site)**

In the fall of 2010, City Staff became aware of information regarding the federal government plan for relocating up to 15,000 employees to the former Nortel facility. This represents a departure from the City's employment projection of approximately 7,200 jobs at the former Nortel site by 2031 (i.e. Official Plan). A plot of the revised employment projections against previous City projections for the Nortel Site is illustrated in Exhibit 2. Given the revised employment projections, the level of employment previously estimated for 2021 is expected to be realized in a shorter timeframe.

**Exhibit 2: Revised Employment Projections: Nortel Site**



Source: Public Works and Government Services Canada (PWGSC) and City of Ottawa

The revised employment projection for the 2021 planning horizon (of approximately 10,000), exceeds the 2031 OP projection of 7,200 jobs. This revised rate of growth in employment levels at the former Nortel Site reflects a faster rise in occupancy levels at the former Nortel Site than those currently identified in the 2031 (OP) planning horizon.

### **Updated Traffic Analysis of Revised Employment Projections at the Former Nortel Site**

The previous traffic analysis indicated that the at-grade Transitway solution would begin to reach capacity by 2021. A change in use of the Nortel site to a federal employment node with the higher employment levels (i.e. 10,000 jobs by 2021) will place more pressure on the at-grade Transitway option over a much shorter timeframe. A sensitivity analysis was undertaken to identify the impacts of the revised employment projection, and to identify when an at-grade

alternative would likely reach capacity and consequently negatively impact upon Transitway operations.

The traffic analysis of the revised employment levels was undertaken at a strategic level and was based on a number of assumptions including the following:

- The review focused on the AM peak hour, when traffic is typically most peaked;
- Future growth in traffic to/from the Nortel Site, while being distributed among an array of alternative routings, will predominately gain access to the site from Moodie Drive. Traffic distribution patterns were reviewed based on the City's long term forecasts, and approximately 2/3 of the future site related traffic (growth) was allocated to the Moodie Drive corridor.
- Transit mode shares were anticipated to improve over time, particularly with further growth at the federal employment node at the former Nortel Site. The City's longer term travel demand forecast indicated non-auto driver mode shares within the 25 to 30 % range for the 2021 and 2031 planning horizon, respectively. The analysis has assumed that the 25% non-auto driver mode share would also be achieved in the short term (i.e. 2016), this implies good transit service and market penetration.

The interim years of 2014 and 2016 were analysed and reflect employment levels of approximately 5,000 and 8,000 employees, respectively. These higher employment levels in 2014 and 2016 were estimated to generate approximately 500 and 1,000 additional vehicle trips at the Highway 417 and Moodie Drive interchange during the AM peak hour. The future level of service at the Moodie Drive and Highway 417 ramps in 2014 and 2016 is highlighted in Table 2 for the at-grade alternative.

**Table 2 – Future Intersection Operations on Moodie Drive**

Intersection	5,000 Employees * (2014)		8,000 Employees * (2016)	
	v/c	LOS	v/c	LOS
Highway 417 EB Ramp	EBL	0.68	B	C
	EBR	0.47	A	A
	NBT	0.33	A	A
	NBR	0.19	A	A
	SBT	0.27	A	A
	SBR	0.15	A	A
Highway 417 WB Ramp	WBL	0.24	A	A
	WBR	<b>1.02</b>	<b>F</b>	<b>F</b>
	NBT	<b>1.03</b>	<b>F</b>	<b>F</b>
	NBR	0.22	A	A
	SBT	0.5	A	A
	SBR	0.29	A	A
	Transitway - SWL	<b>1.01</b>	<b>F</b>	<b>1.38</b>

Note: \* Employment projection for the former Nortel site

The traffic analysis of the at-grade alternative indicated that the Moodie/Hwy 417 intersection (WB Ramp connection) will reach its capacity by 2014, based on the revised employment levels and a higher occupancy rate for the former Nortel Site. Continued employment growth at the Nortel Site to approximately 8,000 jobs by 2016 indicated that the intersection will be over-capacity in 2016. The volume to capacity ratios identified for each of the traffic movements highlights the deficiency of the available intersection capacity to service the traffic demands of the intersection. Based on the revised employment levels anticipated for the former Nortel Site, the at-grade Transitway alternative would not adequately accommodate the shorter term growth (i.e. less than five years) in traffic at the Moodie/Hwy 417 ramp intersections.

### **Conclusion**

The July 2010 traffic analysis applied an employment projection of 6,200 employees at the former Nortel Site. Under this assumption, the analysis identified that the proposed at-grade Transitway alternative for the Moodie Drive/Hwy 417 intersections would reach capacity by about 2021.

However, the revised employment projections, associated with the proposed change in use of the former Nortel Site, indicate employment levels of 8,000 by 2016 and 10,000 by 2021. As a result, the updated traffic analysis of the at-grade Transitway option indicates that the available intersection capacity (at the Moodie/Hwy417 WB Ramp in particular) is only sufficient to accommodate the forecast traffic growth over a 3 to 5 year period. This suggests that the construction of the proposed at-grade Transitway option at Moodie Drive will result in Transitway services operating in congested traffic conditions, with poor levels of service for both traffic and transit operations.

Therefore, it is recommended that the partially grade-separated Transitway (previously recommended for Phase 2 in the Environmental Project Report) be constructed during the initial construction phase of the West Transitway Extension (Bayshore to Moodie). This alternative provides a Westbound Transitway grade separation at Moodie Drive (in the vicinity of the connection with the Highway 417 WB Ramp), while offering an at-grade solution for EB Transitway services. The partially grade-separated alternative is therefore required as an interim improvement, until such time when the Transitway is extended to Kanata and the fully grade-separated alternative would be built. This would isolate and protect Transitway Services from the influence of general traffic operations at the Moodie Drive and Hwy 417 ramp connections.