
APPENDIX B

**CONSTRUCTABILITY/ OPERATIONAL REVIEW
OF CENTRAL SEGMENT – ALTERNATIVE B**



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MEMO

TO: Robert Hunton
FROM: Michel Bisson
DATE: July 15, 2010
COPIES: Peter Steacy, Tim Dickinson
OUR FILE: 7499-40253
SUBJECT: West Transitway Extension – Bayshore Station to Moodie Drive
Central Segment: Alternative B- Constructability / Staging Review

Two design alternatives were considered for the central segment of the Transitway extending from the Graham Creek Tributary east of Holly Acres Road to the confluence of Stillwater Creek and Tributary A west of Moodie Drive. *Alternative A* locates the Transitway immediately north of the existing Highway 417 westbound lanes. *Alternative B* repurposes the two (northernmost) Highway 417 ramp lanes for Transitway use and requires the reconstruction of highway lanes in the median.

The purpose of this memo is to present the results of a preliminary constructability/staging review of Alternative B which was carried out to support the assessment and evaluation of design alternatives.

Scope of Work

The relocation of the Highway 417 westbound lanes towards the median would involve the relocation of high-mast lighting (minimum of 11 poles); and existing roadway protection systems (such as concrete barrier and steel beam guide rail), the reconstruction of storm sewers, and may possibly require the relocation of advanced traffic management system (ATMS) plant.

In addition to constructing 2 new lanes and fully paved shoulders for the relocation of the northbound 416 ramp to westbound 417, shifting the remaining highway lanes towards the median would potentially involve a pavement crown shift. Regrading of the subgrade would likely be required to maintain positive drainage, which would involve the removal and reconstruction of the entire pavement structure of the westbound lanes in this segment.

Based on the work described above, construction would likely be carried-out over 4 stages and would proceed from the median to the outside (northern most) lanes. The estimated time required for construction would be 14 to 18 consecutive months or 2 to 3 years if assuming a six-month construction season.

A brief description of construction staging and associated impacts to traffic is provided below. For the purpose of this analysis, "peak period" means 6am to 10am and 2:30pm to 10pm Monday to Friday as defined by MTO guidelines for lane closures on Highway 417 in Ottawa. In addition, contractors are normally not permitted to load and unload equipment or materials from 6am to 10pm Monday to Friday.

Construction Staging

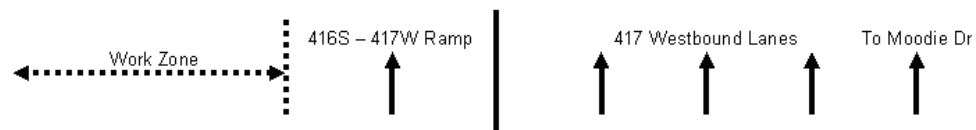
Stage 1: 4-5 months

- Construct realigned 416S-417W ramp, new storm sewers, relocated concrete barrier and ATMS plant;
- Work may be carried-out "offline" from the highway and would have minimal impact to highway traffic;
- Recurring lane and/or ramp closures may be required during off-peak periods for tie-in construction at east and west end; and
- Upon construction completion northbound Highway 416 traffic would be relocated to the realigned ramp and tie into the 417 westbound lanes east of Moodie Drive.

Existing Conditions:



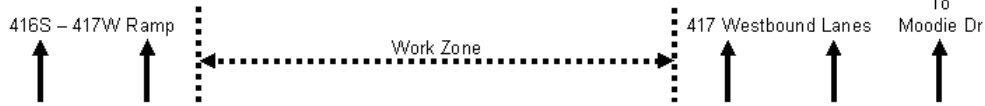
Stage 1:



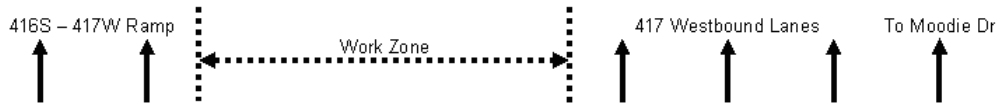
Stage 2: 4-5 months

- Removal of existing pavement structure of 416 ramp, concrete barrier and storm sewers;
- Construction/regarding of a minimum of 2 lanes (closest to median) to allow traffic shift to new lanes;
- Possible use of quick moveable barriers required to allow construction during off-peak periods (i.e. overnight and weekend work) to maintain minimum 2 lanes of traffic during weekdays. This may be periodically increased to three lanes as required;
- Shift traffic to newly-constructed lanes and close Holly Acres S-W ramp to general traffic;
- Introduce traffic detour for 416 South to Moodie via Holly Acres and Carling; and
- There are at least two options for Westbound Transitway buses. The first is to detour buses via Holly Acres | Carling | Moodie and the second involves operating buses on the existing auxiliary lane on Highway 417 - this is less desirable since buses would be operating within the work zone. Impact to transit service would need to be examined further.

Stage 2a:



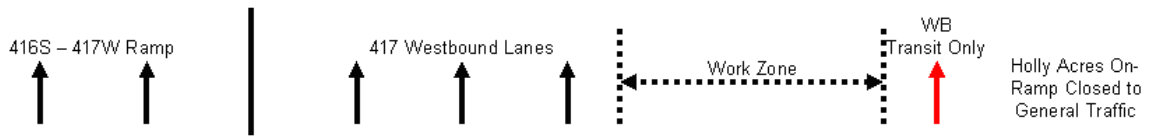
Stage 2b:



Stage 3: 3-4 months

- Construction/regrading of westbound highway auxiliary lane (Holly Acres to Moodie Drive ramp);
- Work may be carried-out with minimal impact to highway traffic;
- Recurring lane and/or ramp closures may be required during off-peak periods for tie-in construction at east and west end;
- Reopen Holly Acres S-W ramp to all traffic upon construction completion.

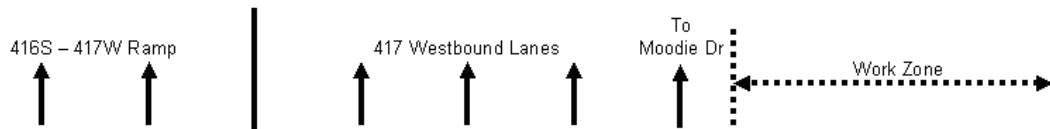
Stage 3:



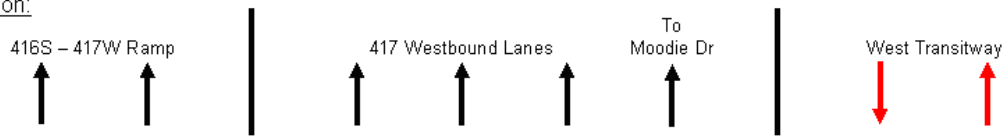
Stage 4: 3-4 months

- Construction of new storm sewers and concrete barrier north of relocated highway lanes; regrading of existing lanes for Transitway;
- Construction of Transitway at-grade connections at Moodie Drive;
- Recurring lane and/or ramp closures may be required during off-peak periods for tie-in to existing facility at east and west end;
- Open West Transitway between Holly Acres and Moodie Drive

Stage 4:



At Completion:



Traffic Impacts

The greatest impact to Highway 416/417 traffic would take place during Stage 2 where mainline lane closures are required. Up to 40,000-50,000 vehicles would be affected daily in the westbound direction given an average annual daily traffic (AADT) of approximately 100,000 in this area. Assuming the Contractor will be permitted to close one of three westbound lanes during construction, traffic queuing would be similar to that experienced during the Highway 417 Expansion construction from 2007 to 2009 where two traffic lanes were maintained at all times. A detailed queuing analysis would be required to further quantify the maximum queue length and average waiting time.

As indicated above, the potential temporary closure of the Holly Acres westbound on-ramp in Stage 3 will require detours to general traffic and possibly westbound bus service between Bayshore Station and Moodie Drive. A traffic analysis of potential detours would be required to assess the impact to intersections along the detours.

It should be noted that construction of the Transitway lanes would be carried-out in the final stage. Opening of the Transitway facility would therefore not occur until 3 years after the start of construction. Construction of the Transitway north of Highway 417 (Mainline Alternative A) from Holly Acres to Moodie would be completed at least 1 year earlier than Mainline Alternative B.