Bradford Bypass Tolling Evaluation

Progress meeting March 2, 2021

Objectives

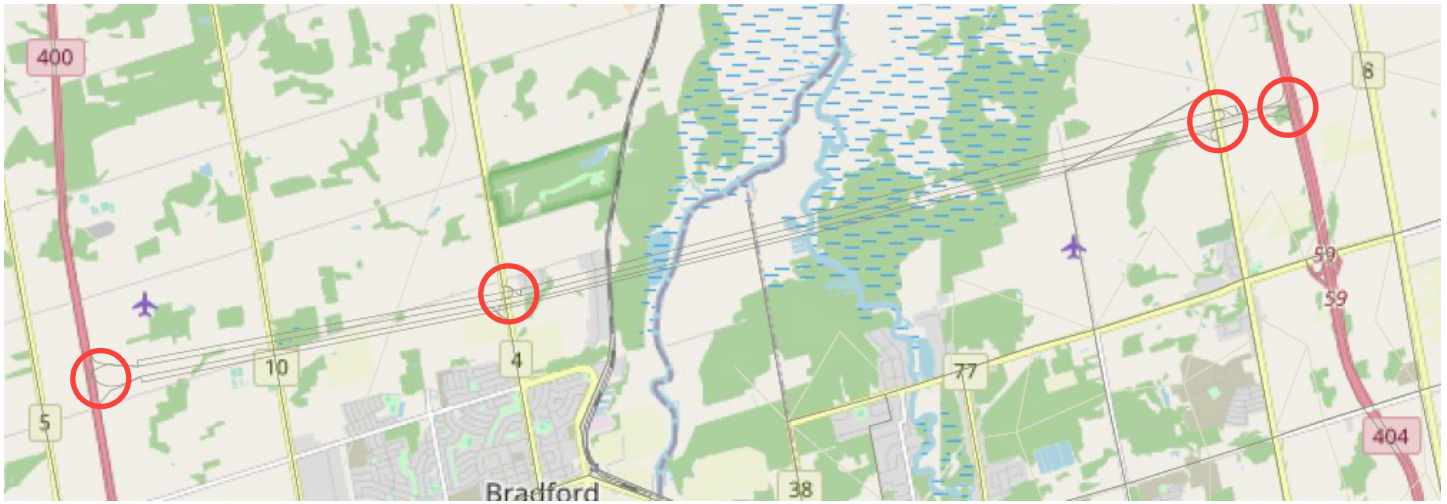
- Evaluate utilization and revenue associated with tolling the proposed Bradford Bypass
- Compare the tolled and untolled scenarios
- Develop business case related to tolling

Baseline scenarios

- Opening day 2031 – travel demand (trip matrices) consistent with the ongoing Preliminary Design/EA update
- Baseline 2031 scenarios *(without GTAW)*:
  A. *Untolled*
  B. *Tolled using current Hwy 407 East rates*

Some key assumptions

- 2 general-purpose lanes in each direction (no HOV lanes)
- Full interchanges at Hwy 400, Hwy 404, Yonge St. and Leslie St.



- Baseline 2031 scenarios do not include the GTAW corridor

More key assumptions

— Use Hwy. 407 East tolling structure as baseline

$/km	Weekday				Weekend	
	6 am - 10 am	10 am – 3 pm	3 pm – 7 pm	7 pm – 6 am	11 am – 7 pm	7 pm – 11 am
Auto/light truck	.30	.24	.30	.19	.23	.19
Single-unit (medium) truck	.59	.47	.59	.39	.45	.39
Multi-unit (heavy) truck	.89	.71	.89	.58	.68	.58

— Tolls assessed between interchanges

— Willingness-to-pay to save time (value of time) based on HOTL surveys as starting point – adjusted through calibration of GGHM

$/h	SOV	HOV2	HOV3+	Light truck	Medium truck	Heavy truck
HOTL survey values	$20/h	$23/h	$26/h	$35/h	$50/h	$70/h
Calibrated values	$36/h	$42/h	$47/h	$60/h	$69/h	$104/h

Modelling methodology

- Use of MTO's GGHM (macroscopic travel demand forecasting model) to assign the same traffic demand to the network:
  - *with and without tolls on the Bypass*
  - *under other alternative scenarios*
- Model assigns traffic to the Bypass vs. alternative routes based on:
  - *Trip origins and destinations*
  - *Relative travel times on routes including the Bypass and on alternative routes not including the Bypass*
  - *Toll rates on the Bypass and the willingness of drivers to pay the toll in exchange for travel time saved (and other perceived advantages)*

Revenue expansion methodology

- Needed to expand AM peak hour traffic volumes (from the model) and toll revenues to weekly/annual values
- The proposed methodology
  - *recognizes vehicle classes and toll rates*
  - *based on available hourly traffic distribution data (Cordon Count and MTO VDS) for 20 407ETR and Highway 407 East counting stations across the GTA*

    (tolled highway used as an analogue since traffic volumes on tolled highways likely to be proportionately lower than untolled highways during off-peak periods and weekends)
- Provisional expansion factors pending evaluation of Highway 407 East traffic counts:
  - *AM peak hour to weekday:* ***8.97***
  - *weekday to week:* ***6.01***
  - *week to annual:* ***51.25***

Progress to date

- Calibration of the GGHM was refined for the AM peak hour
  - *calibration challenging for the mid-day and PM peak periods*
  - *decision made jointly with SAFO to base evaluation on AM peak hour modelling to meet timelines)*
- Baseline scenarios modelled using the calibrated GGHM
- Methodology developed to expand modelled AM peak-hour traffic volumes/toll revenue to annual levels

  (provisional pending consideration of traffic data from Highway 407 East)
- Preliminary results developed for the baseline scenarios

Key results – estimated 2031 AM peak-hour traffic volumes along the Bypass

Veh/hour		Untolled	Tolled	Difference
Eastbound	Hwy 400 - Yonge	2,500	1,900	-24%
	Yonge - Leslie	3,750	3,380	-10%
	Leslie – Hwy 404	3,590	3,150	-12%
Westbound	Hwy 404 - Leslie	2,370	1,670	-30%
	Leslie - Yonge	2,740	2,010	-27%
	Yonge – Hwy 400	2,930	1,710	-42%

Key results – estimated 2031 revenue

	$2016
Average week	$1,335,000
Annual	$68,401,000

Note:

- *These are gross estimates – they have not been adjusted for tolling costs*
- *The numbers may change slightly when the expansion process is verified and enhanced*

Next steps

- Refine and finalize volume/revenue expansion methodology (consider Hwy 407 East data)
- Identify, develop, and evaluate:
  - *Sensitivity scenarios (tolling structure, rates, willingness-to-pay, impact of GTAW, etc.)*
  - *'Optimization' – evaluate relationship between different toll structure/rates and utilization (elasticity) – consider balance between utilization and revenue*
  - *2041 scenarios*
- Extract and expand inputs for estimation of benefits/disbenefits associated with tolling (travel time cost, vehicle operating cost, collision cost)
- Estimate costs associated with tolling implementation and operation
- Develop business case (financial, economic, strategic) for 3 key scenarios (scenarios to be determined)
- Undertake screenline analysis to assess changes in area traffic patterns resulting from tolling of the Bypass

Thank you!

wsp.com

Key results – estimated 2031 AM peak-hour traffic volumes along the Bypass (PCEs) - baseline untolled and tolled scenarios