



Report to: Development Services Committee

Meeting Date: May 24, 2016

SUBJECT: Whistle Cessation on Stouffville GO Line – Progress Update
PREPARED BY: Brian Lee, Deputy Director, Engineering x4838

RECOMMENDATION:

- 1) That the May 24, 2016 report “Whistle Cessation on Stouffville Go Line – Progress Update” be received;
- 2) That York Region be requested to implement a 24-hour anti-whistling by-law for their 6 Regional road grade crossings on the Stouffville GO Line from Kennedy Road (South) to Major Mackenzie Drive East;
- 3) That York Region be requested to budget \$2.20M in their 2017 budget year for their assessed cost of crossing upgrades for anti-whistling on the Stouffville Line,
- 4) That Metrolinx be requested to budget \$1.94M in their 2017 budget year for their share of grade crossing upgrades on the Stouffville Line,
- 5) That Staff provide a further progress update in Fall 2016;
- 6) That Staff be authorized and directed to do all things to give effect to this resolution.

BACKGROUND:

At the January 25, 2016 Development Service Committee meeting, staff provided a presentation to update Committee on the progress of implementation of whistle cessation on Stouffville GO Line. Committee requested that staff provide a further progress update by June 2016, which is as follows.

OPTIONS/ DISCUSSION:

Progress Update

- 1) Community Information Meeting held in March 2016
The Community Information Meeting was held on March 3, 2016 in the Council chamber and was well attended by about 50 residents. Staff made a powerpoint presentation and was followed by questions and answers. Residents are generally supportive of the timelines and satisfied with progress.
- 2) Crossing Upgrades for 13 Crossings
In a letter from staff dated May 10, 2016, staff confirmed with Metrolinx and York Region that they are in agreement with the safety upgrade measures to implement anti-whistling. Metrolinx has confirmed verbally that the safety upgrades will meet the

prescribed requirements of the *Grade Crossing Regulations* and Standards (See Attachment 'A' for the crossing upgrades).

3) Crossing Upgrade Estimates

Cost sharing of upgrades between Metrolinx, Region and Markham has been agreed to in principle. As per Attachment 'B', the assessed costs are \$1.26M for Markham, \$2.20M for York Region and \$1.94M for Metrolinx, for a total of \$5.4M. These estimates include approximately 30% contingency to cover construction contingency, design, permit and other fees payable to Metrolinx for crossing upgrades. Staff will include Markham's share (less available funds) in the 2017 Capital budget process for Council's consideration.

4) Metrolinx Indemnification Agreement

Metrolinx has provided a copy of a sample indemnification agreement which is being reviewed by the York Region and City legal departments. The Indemnity Agreement requires the road authorities obtain additional insurance and assume full responsibility/liability for any claims, damages, etc, resulting from incidents that arise from or could have arisen but for the whistle cessation. Staff will report back to Council in Fall 2016 with a further report on the Indemnification agreement for Council's approval.

5) Request for Proposal for Design Consulting Services

A Request for Proposal (RFP) to retain a consulting engineer qualified and experienced to design Anti-Whistling safety upgrades was released for competitive bidding on April 28, 2016. The RFP closed on May 19, 2016. Engineering staff are currently engaged in evaluation of the proposals. The intension is to award the design assignment by early July 2016.

6) Safety Program and Trespassing

Staff has contacted Operation Lifesaver with respect to safety and education program. Operation Lifesaver (<http://operationlifesaver.ca/>) is a public-private partnership educating road users about the hazards surrounding rail corridors, crossings and trains. In terms of preventing trespassing incidents, this will be done through education, engineering and enforcement. The education process will be implemented prior to the start of whistle cessation. A preliminary meeting with Operation Lifesavers/ Metrolinx, Region, school boards and York Region Police is being arranged for June/ July 2016.

Next Steps and Schedule

As reported in the January 2016 update to Development Services Committee, the next steps are:

- Tender Award for Consulting Service for detailed design – June/ July 2016
- 2017 Capital budget request – June 2016
- Report regarding Indemnification Agreement – Fall 2016
- Completion detailed design – Early 2017
- Execute agreements or MOU with Metrolinx and York Region for construction – Spring 2017

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- Execute agreements or MOU with Metrolinx and York Region for construction – Spring 2017
 - Tender project – Early 2017 (subject to funding approval)
 - Construction – Spring 2017 to Summer 2018

FINANCIAL CONSIDERATIONS

There are no financial implications with this progress update.

HUMAN RESOURCES CONSIDERATIONS

Not Applicable.

ALIGNMENT WITH STRATEGIC PRIORITIES:

Not Applicable.

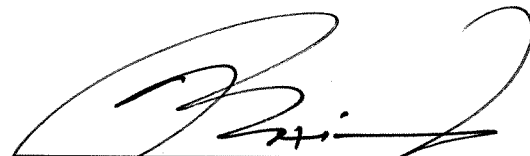
BUSINESS UNITS CONSULTED AND AFFECTED:

Not Applicable.

RECOMMENDED BY:



Alan Brown, C.E.T.
Director of Engineering



Jim Baird, M.C.I.P., R.P.P.
Commissioner, Development Services

ATTACHMENTS:

Attachment 'A' – Safety Upgrades at Each Crossing

Attachment 'B' – Assessed Estimates to York Region and Metrolinx

Attachment A: Proposed Crossing Safety Upgrades on 13 Grade Crossings

Crossing	Recommendations/Findings
Major Mackenzie Drive	Pavement markings and signs should be corrected to conform with MUTCD Standards (AWS, X-markings, Stop Bar)
	Install/relocate WA-18 signs
	Brush around the crossing should be cut back
	Install two (2) Maze "Z" Barriers and two (2) AODA surface treatments on sidewalks on the south side
	Install "No Train Whistle at This Crossing" signs
Castlemore Ave	Pavement markings and signs should be corrected to conform to MUTCD Standards (AWS, X-markings, Stop Bar)
	Install/relocate WA-18 signs
	Install "No Train Whistle at This Crossing" signs
	Install four (4) AODA surface treatments on sidewalks.
Bur Oak Ave	Pavement markings and signs should be corrected to conform with MUTCD Standards (AWS, X-markings, Stop Bar)
	Install/relocate WA-18 signs
	Install four (4) pedestrian gates with active warning lights and bells
	Brush around the crossing should be cut back
	Install "No Train Whistle at This Crossing" signs
	Install four (4) AODA surface treatments on sidewalks
16 th Ave	Install RB-1 "Maximum Speed Signs"
	Railway Crossing Sign is to be relocated
	Pavement markings and signs should be corrected to conform with MUTCD Standards (AWS, X-markings, Stop Bar)
	Grading around the signal foundation is required as it is greater than 0.1 meters from ground level
	Sightlines are impeded in the SW & NW quadrants due to brush and it should be trimmed
	Install "Do Not Stop on Tracks" sign
	Install "No Train Whistle at This Crossing" signs
	Install one (1) pedestrian gates at the NW quadrant
	Install four (4) Maze "Z" Barriers and four (4) AODA surface treatments beyond gates
	Install sidewalk at west side of plaza driveway
	Install fence at railway right-of-way to control pedestrian traffic
Main Street Markham	Sidewalk width to improve to 1.5 meters
	Railway Crossing Sign requires relocation as it is further than the allowed 0.3 meters to 2.0 meters from the face of the curb
	Pavement markings and signs should be corrected to conform with MUTCD Standards (AWS, X-markings, Stop Bar)

Attachment A: Proposed Crossing Safety Upgrades on 13 Grade Crossings

	Install "Do Not Stop on Tracks" sign
	Install "No Train Whistle at This Crossing" signs
	Install four (4) Maze "Z" Barriers and four (4) AODA surface treatments on sidewalks
Snider Drive	Install WA-19 signs on either side of the South approach (on Bullock Road)
	Signal foundation is more than 0.1 meters from the ground level on the north approach needs to be re-graded
	Pavement markings and signs should be corrected to conform with MUTCD Standards (AWS, X-markings, Stop Bar)
	Removal of trees in the NE quadrant.
	Install four (4) Maze "Z" Barriers and four (4) AODA surface treatments on sidewalks
	Install "No Train Whistle at This Crossing" signs
McCowan Road	Signal foundation is more than 0.1 meters from the ground level on the north approach needs to be re-graded
	Pavement markings and signs should be corrected to conform with MUTCD Standards (AWS, X-markings, Stop Bar)
	Install/relocate WA-18 signs
	Install four (4) pedestrian gates with active warning lights and bells.
	Remove brushes and trees in all quadrants
	Install "No Train Whistle at This Crossing"
	Install four (4) Maze "Z" Barriers and four (4) AODA surface treatments on sidewalks
Kennedy Road (North)	NW and SW sidewalk needs to be continued, and completed over the crossing
	Pavement markings and signs should be corrected to conform with MUTCD Standards (AWS, X-markings, Stop Bar)
	Install RB-1 "Maximum Speed Signs"
	Install/relocate WA-18 signs
	Trees in all quadrants are to be trimmed /removed
	Install "No Train Whistle at This Crossing" signs
	Install four (4) Maze "Z" Barriers and four (4) AODA surface treatments on sidewalks
Main Street Unionville	Install RB-1 "Maximum Speed Signs" on the north approach
	Install/relocate WA-18 signs
	Pavement markings and signs should be corrected to conform with MUTCD Standards (AWS, X-markings, No Passing lines, Stop Bar)
	Re-grade around the signal foundation as it is greater than 0.1 meters from the ground level
	Removal of hedges/brush in all quadrants
	Parking sign in the NW quadrant to be removed
	Install "No Train Whistle at This Crossing" signs
	Install four (4) Maze "Z" Barriers and four (4) AODA surface treatments on sidewalks
	Install chain link fence and signage
Clean up area around the crossing (graffiti from signal bungalow)	
Eureka	Install RB-1 "Maximum Speed Signs"

Attachment A: Proposed Crossing Safety Upgrades on 13 Grade Crossings

Street	West sidewalk width to be improved to 1.5m
	Sidewalk slope in the NW and SW quadrants are greater than allowed 1% and should be corrected
	Pavement markings and signs to conform with MUTCD Standards (AWS, X-markings, "No Passing" Lines, Stop Bars)
	Brush to be removed in all quadrants
	Install one (1) pedestrian gates with active warning lights and bells at south-west (geographic) quadrant
	Install "No Train Whistle at This Crossing" signs
	Install fencing on east side of crossing
	Remove graffiti from signals box
	Install two (2) Maze "Z" Barriers and two (2) AODA surface treatments on sidewalks
Highway 7	Pavement markings and signs should be corrected to conform with MUTCD Standards (AWS, X-markings, Stop Bar)
	Install/relocate WA-18 signs
	Bushes to be trimmed in all quadrants
	'No Trespassing' signs should be installed in the NE and SE quadrants.
	Install "No Train Whistle at This Crossing" signs
	Install four (4) Maze "Z" Barriers and four (4) Maze "Z" Barriers and four (4) AODA surface treatments on sidewalks
Denison Street	Pavement markings and signs should be corrected to conform with MUTCD Standards (X-markings, Stop Bar)
	Install/relocate WA-18 signs
	Sidewalks should be designed and installed on both sides of the crossing
	Bushes to be trimmed in all quadrants
	Install three (3) pedestrian gates with active warning lights and bells (actual number of gates to be determined)
	Install "No Train Whistle at This Crossing"
	Install four (4) Maze "Z" Barriers and four (4) AODA surface treatments on sidewalks
Kennedy Road (South)	Pavement markings and signs should be corrected to conform with MUTCD Standards (AWS, X-markings, Stop Bar)
	Install/relocate WA-18 signs
	Re-grade around the signal foundation as it is greater than 0.1 meters from the ground level
	Install four (4) pedestrian gates with active warning lights and bells
	Install "No Train Whistle at This Crossing" signs
	Install four (4) Maze "Z" Barriers and four (4) AODA surface treatments on sidewalks

Attachment 'B' – Assessed Estimates to York Region and Metrolinx

No.	Crossing	Estimated Cost	Cost Sharing		
			Metrolinx	Region	Markham
1.	Major Mackenzie Dr.	\$34,700	\$4,850	\$27,850	\$2,000
2.	Castlemore Ave	\$12,700	\$850		\$11,850
3.	Bur Oak Ave	\$816,700	\$804,850		\$11,850
4.	16 th Ave	\$266,100	\$8,050	\$249,550	\$8,500
5.	Main Street Markham	\$66,400	\$1,700		\$64,700
6.	Snider Drive	\$55,950	\$3,600		\$52,350
7.	McCowan Road	\$858,200	\$406,350	\$447,850	\$4,000
8.	Kennedy Road (North)	\$68,400	\$9,700	\$48,700	\$10,000
9.	Main Street Unionville	\$81,450	\$13,775		\$67,675
10.	Eureka Street	\$254,200	\$205,350		\$48,850
11.	Highway 7	\$57,200	\$4,100	\$49,100	\$4,000
12.	Denison Street	\$672,700	\$8,850		\$663,850
13.	Kennedy Road (South)	\$854,200	\$2,350	\$847,850	\$4,000
	Sub-total :	\$4,098,900 ≈ (\$4.1M)	\$1,474,375 ≈ (\$1.48M)	\$1,670,900 ≈ (\$1.67M)	\$953,625 ≈ (\$0.95M)
	Include 30% soft cost + 1.76% tax impact	\$1,301,810.64	\$468,261.50	\$530,677.84	\$302,871.30
	Total =	\$5,400,710.64 ≈ \$5.40M	\$1,942,636.50 ≈ \$1.94M	\$2,201,577.84 ≈ \$2.20M	\$1,256,496.30 ≈ \$1.26M

Date: May 4, 2016

Crossing at: Major Mackenzie Drive

Mileage: 44.96

Road Authority: York Region

Is there evidence of trespassing: No

Warning System:

For Vehicles	For Pedestrians
FLB & G	Sidewalk in one side- No additional measures.

Findings & Recommendations:

	Recommendations/Findings	Triggered by		Estimated Cost	Proposed Cost Sharing (%)		
		AW	GCR		Metrolinx	Region	Markham
1	Pavement markings and signs should be corrected to conform to MUTCD Standards (AWS, X-markings, Stop Bar)		√	\$4,000 (X-marking: 2*\$1,000) (Stop bars: 2*\$1,000)		\$4,000 (100%)	
2	Install/relocate WA-18 signs		√	\$1,700 (2*\$850)	\$850 (50%)	\$850 (50%)	
3	Brush around the crossing should be cut back		√	\$4,000 (2*\$2,000)	\$4,000 (100%)		
4	Install two (2) Maze "Z" Barriers (South side only)	√		\$20,000 (2*\$10,000)		\$20,000 (100%)	
5	Install "No Train Whistle at This Crossing" signs	√		\$3,000 (2* \$1,500)		\$3,000 (100%)	
6	Add two (2) AODA surface treatments on sidewalks (South side only)	√		\$2,000 (2* \$1,000)			\$2,000 (100%)
Sub-total =				\$34,700	\$4,850	\$27,850	\$2,000

Date: May 4, 2016

Crossing at: Castlemore Ave

Mileage: 45.47

Road Authority: City of Markham

Is there evidence of trespassing: No

Warning System:

For Vehicles	For Pedestrians
FLB & G	Maze gate (4)- Both sides have sidewalks

Findings & Recommendations:

	Recommendations	Triggered by		Estimated Cost	Proposed Cost Sharing (%)		
		AW	GCR		Metrolinx	Region	Markham
1	Pavement markings and signs should be corrected to conform to MUTCD Standards (AWS, X-markings, Stop Bar)		√	\$4,000 (X-Marking: 2*\$1,000) (Stop bars: 2*\$1,000)			\$4,000 (100%)
2	Install/relocate WA-18 signs		√	\$1,700 (2*\$850)	\$850 (50%)		\$850 (50%)
3	Install "No Train Whistle at This Crossing" signs	√		\$3,000 (2* \$1,500)			\$3,000 (100%)
4	Install four (4) AODA surface treatments on sidewalks.	√		\$4,000 (4*\$1,000)			\$4,000 (100%)
Sub-total =				\$12,700	\$850		\$11,850

Date: May 4, 2016

Crossing at: Bur Oak Ave

Mileage: 45.74

Road Authority: City of Markham

Is there evidence of trespassing: No

Warning System:

For Vehicles	For Pedestrians
FLB & G	Maze gate (4)- both sides have sidewalks

Findings & Recommendations:

	Recommendations	Triggered by		Estimated Cost	Proposed Cost Sharing (%)		
		AW	GCR		Metrolinx	Region	Markham
1	Pavement markings and signs should be corrected to conform to MUTCD Standards (AWS, X-markings, Stop Bar)		√	\$4,000 (X-marking: 2*\$1,000) (Stop bars: 2*\$1,000)			\$4,000 (100%)
2	Install/relocate WA-18 signs		√	\$1,700 (2*\$850)	\$850 (50%)		\$850 (50%)
3	Install four (4) pedestrian gates with active warning lights and bells.		√	\$800,000 (4* \$200,000)	\$800,000 (100%)		
4	Brush around the crossing should be cut back.		√	\$4,000 (2*\$2,000)	\$4,000 (100%)		
5	Install "No Train Whistle at This Crossing" signs.	√		\$3,000 (2* \$1,500)			\$3,000 (100%)
6	Install four (4) AODA surface treatments on sidewalks	√		\$4,000 (4*\$1,000)			\$4,000 (100%)
Sub-total =				\$816,700	\$804,850		\$11,850

Date: May 4, 2016

Crossing at: 16th Ave

Mileage: 46.31

Road Authority: York Region

Is there evidence of trespassing: No

Warning System:

For Vehicles	For Pedestrians
FLB & G	Arm gates cover the sidewalks- both sides have sidewalks.

Findings & Recommendations:

	Recommendations	Triggered by		Estimated Cost	Proposed Cost Sharing (%)		
		AW	GCR		Metrolinx	Region	Markham
1	Install RB-1 "Maximum Speed Signs"		√	\$1,700 (2*\$850)	\$850 (50%)	\$850 (50%)	
2	Railway Crossing Sign is to be relocated		√	\$1,700 (2*\$850)	\$850 (50%)	\$850 (50%)	
3	Pavement markings and signs should be corrected to conform to MUTCD Standards (AWS, X-markings, Stop Bar)		√	\$4,000 (x-Marking: 2*\$1,000) (Stop bars: 2*\$1,000)		\$4,000 (100%)	
4	Grading around the signal foundation is required as it is greater than 0.1 meters from ground level		√	\$1,500 (2*\$750)	\$1,500 (100%)		
5	Sightlines are impeded in the SW & NW quadrants due to brush and it should be trimmed.		√	\$4,000 (2*\$2,000)	\$4,000 (100%)		
6	Install "Do NOT Stop on Tracks" sign		√	\$1,700 (2*\$850)	\$850 (50%)	\$850 (50%)	
7	Install four (4) Maze "Z" Barriers	√		\$40,000 (4*\$10,000)		\$40,000 (100%)	
8	Install "No Train Whistle at This Crossing" signs	√		\$3,000 (2* \$1,500)		\$3,000 (100%)	
9	Install one (1) pedestrian gate in North West quadrant (geographic)	√		\$200,000 (1*\$200,000)		\$200,000 (100%)	
10	Install four (4) AODA surface treatments beyond gates.	√		\$4,000 (4*\$1,000)			\$4,000 (100%)
11	Install sidewalk at plaza driveway	√		\$1,500			\$1,500 (100%)
12	Install fence at railway Right-of-Way to control pedestrian movement	√		\$3,000			\$3,000 (100%)
Sub-total =				\$266,100	\$8,050	\$249,550	\$8,500

Date: May 4, 2016

Crossing at: Main Street Markham

Mileage: 46.95

Road Authority: City of Markham

Is there evidence of trespassing: No

Warning System:

For Vehicles	For Pedestrians
FLB & G	Gate arms cover the sidewalks -Both sides have sidewalks
	Fence in one side

Findings & Recommendations:

	Recommendations	Triggered by		Estimated Cost	Proposed Cost Sharing (%)		
		AW	GCR		Metrolinx	Region	Markham
1	Sidewalk width is less than 1.5 meters (1.2 meters to the East and 1.4 meters to the West)		√	\$12,000 (4*\$3,000)			\$12,000 (100%)
2	Railway Crossing Sign requires relocation as it is further than the allowed 0.3 meters to 2.0 meters from the face of the curb		√	\$1,700 (2*\$850)	\$850 (50%)		\$850 (50%)
3	Pavement markings and signs should be corrected to conform to MUTCD Standards (AWS, X-markings, Stop Bar)		√	\$4,000 (X-marking: 2*\$1,000) (Stop bars: 2*\$1,000)			\$4,000 (100%)
4	Install "Do Not Stop on Tracks" sign		√	\$1,700 (2*\$850)	\$850 (50%)		\$850 (50%)
5	Install "No Train Whistle at This Crossing" signs	√		\$3,000 (2* \$1,500)			\$3,000 (100%)
6	Install four (4) AODA surface treatments on sidewalks	√		\$4,000 (4*\$1,000)			\$4,000 (100%)
7	Install four (4) Maze "Z" Barriers	√		\$40,000 (4*\$10,000)			\$40,000 (100%)
Sub-total =				\$66,400	\$1,700		\$64,700

Date: May 4, 2016

Crossing at: Snider Drive

Mileage: 47.17

Road Authority: City of Markham

Is there evidence of trespassing: No

Warning System:

For Vehicles	For Pedestrians
FLB & G	No specific measures- both sides have sidewalks.

Findings & Recommendations:

	Recommendations	Triggered by		Estimated Cost	Proposed Cost Sharing (%)		
		AW	GCR		Metrolinx	Region	Markham
1	WA-18 sign is installed on the north approach, however, it is necessary to install WA-19 signs on either side of the South approach (on Bullock Road)		√	\$1,700 (2*\$850)	\$850 (50%)		\$850 (50%)
2	Signal foundation is more than 0.1 meters from the ground level on the north approach needs to be regraded		√	\$750	\$750 (100%)		
3	Pavement markings and signs should be corrected to conform to MUTCD Standards (AWS, X- markings, Stop Bar)		√	\$3,000 (X-marking: 1*\$1,000) (Stop bars: 2*\$1,000)			\$3,000 (100%)
4	Removal of trees in the NE quadrant.		√	\$2,000	\$2,000 (100%)		
5	Install four (4) Maze "Z" Barriers	√		\$40,000 (4*\$10,000)			\$40,000 (100%)
6	Install "No Train Whistle at This Crossing" signs	√		\$4,500 (3* \$1,500)			\$4,500 (100%)
7	Install four (4) AODA surface treatments on sidewalks	√		\$4,000 (4*\$1,000)			\$4,000 (100%)
Sub-total =				\$55,950	\$3,600		\$52,350

Date: May 4, 2016

Crossing at: McCowan Road

Mileage: 48.38

Road Authority: York Region

Is there evidence of trespassing: No

Warning System:

For Vehicles	For Pedestrians
FLB & G	No specific measures- Both sides have sidewalks

Findings & Recommendations:

	Recommendations	Triggered by		Estimated Cost	Proposed Cost Sharing (%)		
		AW	GCR		Metrolinx	Region	Markham
1	Signal foundation is more than 0.1 meters from the ground level on the North approach and requires regrading		√	\$1,500 (2*\$750)	\$1,500 (100%)		
2	Pavement markings and signs should be corrected to conform to MUTCD Standards (AWS, X-markings, Stop Bar)		√	\$4,000 (X-Marking: 2*\$1,000) (Stop Bars: 2*\$1,000)		\$4,000 (100%)	
3	Install/relocate WA-18 signs		√	\$1,700 (2*\$850)	\$850 (50%)	\$850 (50%)	
4	a) Install pedestrian gate for the west sidewalk		√	\$400,000 (2*\$200,000)	\$400,000 (100%)		
	b) Install Pedestrian gate for the east sidewalk	√		\$400,000 (2*\$200,000)		\$400,000 (100%)	
5	The removal of the brush and trees in the NE, NW, and SW quadrants are required.		√	\$4,000 (2*\$2,000)	\$4,000 (100%)		
6	Install "No Train Whistle at This Crossing"	√		\$3,000 (2* \$1,500)		\$3,000 (100%)	
7	Install four (4) AODA surface treatments on sidewalks	√		\$4,000 (4*\$1,000)			\$4,000 (100%)
8	Install four (4) Maze "Z" Barriers	√		\$40,000 (4*\$10,000)		\$40,000 (100%)	
Sub-total =				\$858,200	\$406,350	\$447,850	\$4,000

Question to Metrolinx: Can we consider additional platform on north side of the track?

Date: May 4, 2016

Crossing at: Kennedy Road (North)

Mileage: 49.42

Road Authority: York Region

Is there evidence of trespassing: No

Warning System:

For Vehicles	For Pedestrians
FLB & G	No special measures- Both sides have sidewalks.

Findings & Recommendations:

	Recommendations	Triggered by		Estimated Cost	Proposed Cost Sharing (%)		
		AW	GCR		Metrolinx	Region	Markham
1	NW and SW sidewalk needs to be continued, and completed over the crossing		√	\$6,000 (2*\$3,000)			\$6,000 (100%)
2	Pavement markings and signs should be corrected to conform to MUTCD Standards (AWS, X-markings, Stop Bar)		√	\$4,000 (x-Marking: 2*\$1,000) (Stop bars: 2*\$1,000)		\$4,000 (100%)	
3	Install RB-1 "Maximum Speed Signs"		√	\$1,700 (2*\$850)	\$850 (50%)	\$850 (50%)	
4	Install/relocate WA-18 signs		√	\$1,700 (2*\$850)	\$850 (50%)	\$850 (50%)	
5	Sightlines are impeded in all quadrants due to trees and houses. Trees are to be trimmed /removed.		√	\$8,000 (4*\$2,000)	\$8,000 (100%)		
6	Install four (4) Maze "Z" Barriers on sidewalks	√		\$40,000 (4*\$10,000)		\$40,000 (100%)	
7	Install "No Train Whistle at This Crossing" signs	√		\$3,000 (2* \$1,500)		\$3,000 (100%)	
8	Install four (4) AODA surface treatments on sidewalks	√		\$4,000 (4*\$1,000)			\$4,000 (100%)
Sub-total =				\$68,400	\$9,700	\$48,700	\$10,000

Date: May 4, 2016

Crossing at: Main Street Unionville

Mileage: 49.78

Road Authority: City of Markham

Is there evidence of trespassing: No

Warning System:

For Vehicles		For Pedestrians
FLB & G		No special measures- both sides have sidewalks

Findings & Recommendations:

	Recommendations	Triggered by		Estimated Cost	Proposed Cost Sharing (%)		
		AW	GCR		Metrolinx	Region	Markham
1	Install RB-1 "Maximum Speed Signs" on the north approach		√	\$850	\$425 (50%)		\$425 (50%)
2	Install/relocate WA-18 signs		√	\$1,700 (2*\$850)	\$850 (50%)		\$850 (50%)
3	Pavement markings and signs should be corrected to conform to MUTCD Standards (AWS, X-markings, No Passing lines, Stop Bar)		√	\$3,000 (X-marking: 2*\$1,000) (No Passing: 1*\$1,000)			\$3,000 (100%)
4	Regrading around the signal foundation as it is greater than 0.1 meters from the ground level		√	\$1,500 (2*\$750)	\$1,500 (100%)		
5	Sightlines are impeded in NE, NW, and SW quadrants due to hedges/brush. The removal of hedges/brush is required.		√	\$6,000 (3*\$2,000)	\$6,000 (100%)		
6	Parking sign in the NW quadrant should be removed as a parked vehicle obstructs visibility of the crossing warning system (Need clarification from AECOM)		√	\$1,000			\$1,000 (100%)
7	Install four (4) Maze "Z" Barriers on sidewalks	√		\$40,000 (4*\$10,000)			\$40,000 (100%)
8	Install "No Train Whistle at This Crossing" signs	√		\$3,000 (2* \$1,500)			\$3,000 (100%)
9	Install four (4) AODA surface treatments on sidewalks	√		\$4,000 (4*\$1,000)			\$4,000 (100%)
10	Install chain link fence and signage	√		\$15,400			\$15,400 (100%)
11	Clean up area around the crossing (graffiti from signal bungalow)		√	\$5,000	\$5,000 (100%)		
Sub-total =				\$81,450	\$13,775		\$67,675

Date: May 4, 2016

Crossing at: Eureka Street

Mileage: 49.94

Road Authority: City of Markham

Is there evidence of trespassing: No

Warning System:

For Vehicles	For Pedestrians
FLB & G	No special measures- sidewalk in one side.

Findings & Recommendations:

	Recommendations	Triggered by		Estimated Cost	Proposed Cost Sharing (%)		
		AW	GCR		Metrolinx	Region	Markham
1	Install RB-1 "Maximum Speed Signs"		√	\$1,700 (2*\$850)	\$850 (50%)		\$850 (50%)
2	West sidewalk width needs to be addressed as it is less than required (1.3 meters instead of 1.5 meters)		√	\$6,000 (2*\$3,000)			\$6,000 (100%)
3	Sidewalk slope in the NW and SW quadrants are greater than allowed (NW-1.1% , SW- 1.4% instead of 1%) and should be corrected		√	\$6,000 (2*\$3,000)			\$6,000 (100%)
4	Pavement markings and signs to conform to MUTCD Standards (AWS, X-markings, "No Passing" Lines, Stop Bars * note that there were no X-markings)		√	\$6,000 (X-Marking: 2*\$1,000) (No Passing: 2*\$1,000) Stop bars: 2*\$1,000)			\$6,000 (100%)
5	Sightlines are impeded in all quadrants due to bushes, houses, and curvature of rail beyond the crossing. Brush should be removed.		√	\$4,000	\$4,000 (100%)		
6	Pedestrian lights, bells, and gates at south-west (geographic) quadrant		√	\$200,000 (1*\$200,000)	\$200,000 (100%)		
7	Install "No Train Whistle at This Crossing" signs	√		\$3,000 (2* \$1,500)			\$3,000 (100%)
8	Install fencing on east side of the crossing	√		\$5,000			\$5,000 (100%)
9	Remove graffiti from signals box		√	\$500	\$500 (100%)		
10	Install two (2) AODA surface treatments on sidewalks	√		\$2,000			\$2,000 (100%)
11	Install two (2) Maze "Z" Barriers on sidewalks	√		\$20,000 (2*\$10,000)			\$20,000 (100%)
Sub-total =				\$254,200	\$205,350		\$48,850

Date: May 4, 2016

Crossing at: Highway 7

Mileage: 50.13

Road Authority: York region

Is there evidence of trespassing: Yes

Warning System:

For Vehicles	For Pedestrians
FLB & G	No specific measures- both sides have sidewalks.

Findings & Recommendations:

	Recommendations	Triggered by		Estimated Cost	Proposed Cost Sharing (%)		
		AW	GCR		Metrolinx	Region	Markham
1	Pavement markings and signs should be corrected to conform to MUTCD Standards (AWS, X-markings, Stop Bar)		√	\$4,000 (X-marking: 2*\$1,000) (Stop bars: 2*\$1,000)		\$4,000 (100%)	
2	Install/relocate WA-18 signs		√	\$1,700 (2*\$850)	\$850 (50%)	\$850 (50%)	
3	Sightlines are impeded in all quadrants, especially the SW quadrant, due to bushes, buildings, and the curvature of the rail beyond the crossing. Bushes should be trimmed to improve sightlines		√	\$2,000	\$2,000 (100%)		
4	'No Trespassing' signs should be installed in the Northeast and Southeast quadrants.	√	√	\$2,500 (2*\$1,250)	\$1,250 (50%)	\$1,250 (50%)	
5	Install four (4) Maze "Z" Barriers	√		\$40,000 (4*\$10,000)		\$40,000 (100%)	
6	Install "No Train Whistle at This Crossing" signs	√		\$3,000 (2* \$1,500)		\$3,000 (100%)	
7	Install four (4) AODA surface treatments on sidewalks	√		\$4,000 (4* \$1,000)			\$4,000 (100%)
Sub-total =				\$57,200	\$4,100	\$49,100	\$4,000

Date: May 4, 2016

Crossing at: Denison Street

Mileage: 51.98

Road Authority: City of Markham

Is there evidence of trespassing: Yes

Warning System:

For Vehicles	For Pedestrians
FLB & G	No specific measures- both sides have sidewalks.

Findings & Recommendations:

	Recommendations	Triggered by		Estimated Cost	Proposed Cost Sharing (%)		
		AW	GCR		Metrolinx	Region	Markham
1	Pavement markings and signs should be corrected to conform to MUTCD Standards (X-markings, Stop Bar)		√	\$4,000 (X-Marking: 2*\$1,000) (Stop bars: 2*\$1,000)			\$4,000 (100%)
2	Install/relocate WA-18 signs		√	\$1,700 (2*\$850)	\$850 (50%)		\$850 (50%)
3	Sidewalks should be designed and installed on both sides of the crossing		√	\$12,000 (4*\$3,000)			\$12,000 (100%)
4	Sightlines are impeded in all quadrants due to curvature of rail beyond the crossing, buildings, trees, and bushes. Trees and bushes should be trimmed to improve sightlines		√	\$8,000 (4*\$2,000)	\$8,000 (100%)		
5	Install three (3) Pedestrian gates (Actual number of gates to be determined)	√		\$600,000 (3*\$200,000)			\$600,000 (100%)
6	Install "No Train Whistle at This Crossing"	√		\$3,000 (2* \$1,500)			\$3,000 (100%)
7	Install four (4) AODA surface treatments on sidewalks	√		\$4,000 (4*\$1,000)			\$4,000 (100%)
8	Install four (4) Maze "Z" Barriers	√		\$40,000 (4*\$10,000)			\$40,000 (100%)
Sub-total =				\$672,700	\$8,850		\$663,850

Date: May 4, 2016

Crossing at: Kennedy Road (South)

Mileage: 52.40

Road Authority: York Region

Is there evidence of trespassing: No

Warning System:

For Vehicles	For Pedestrians
FLB & G	No specific measures- both sides have sidewalks.

Findings & Recommendations:

	Recommendations	Triggered by		Estimated Cost	Proposed Cost Sharing (%)		
		AW	GCR		Metrolinx	Region	Markham
1	Pavement markings and signs should be corrected to conform to MUTCD Standards (AWS, X-markings, Stop Bar)		√	\$4,000 (X Marking: 2*\$1,000) (Stop bars: 2*\$1,000)		\$4,000 (100%)	
2	Install/relocate WA-18 signs		√	\$1,700 (2*\$850)	\$850 (50%)	\$850 (50%)	
3	Regrading around the signal foundation as it is greater than 0.1 meters from the ground level		√	\$1,500 (2*\$750)	\$1,500 (100%)		
4	Install four (4) pedestrian gates	√		\$800,000 (4*\$200,000)		\$800,000 (100%)	
5	Install "No Train Whistle at This Crossing" signs	√		\$3,000 (2* \$1,500)		\$3,000 (100%)	
6	Install four (4) AODA surface treatments on sidewalks	√		\$4,000 (4*\$1,000)			\$4,000 (100%)
7	Install four (4) Maze "Z" Barriers	√		\$40,000 (4*\$10,000)		\$40,000 (100%)	
Sub-total =				\$854,200	\$2,350	\$847,850	\$4,000