



Report to: Development Services Committee

Date: November 7, 2016

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**SUBJECT:** Highway 404 Ramp Extension (Aristotle Avenue) at Highway 7, and  
Highway 404 Mid-Block Crossing (Norman Bethune Avenue) between Allstate Parkway and East Beaver Creek Road

**PREPARED BY:** Alice Lam, Manager, Capital Works, Ext 2354  
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**RECOMMENDATION:**

- 1) THAT the report entitled “Highway 404 Ramp Extension (Aristotle Avenue) at Highway 7, and Highway 404 Mid-Block Crossing (Norman Bethune Avenue) between Allstate Parkway and East Beaver Creek Road” be received;

**HIGHWAY 404 MID-BLOCK CROSSING (NORMAN BETHUNE AVENUE) BETWEEN HIGHWAY 7 AND 16TH AVENUE - (the “Highway 404 Mid-Block Crossing”)**

- 2) THAT the Engineering Department Capital Administration Fee in the amount of \$156,640.58, be charged to revenue account 640-998-8871 (Capital Admin Fees);
- 3) THAT the 2018 operating budget for the Asset Management Department (\$3,388.00) and Operations Department (\$21,642.37) be increased to fund annual operations and maintenance requirements for Highway 404 Mid-Block Crossing as set out in this report;
- 4) THAT the 2018 Lifecycle Replacement and Capital Reserve study be updated to include an additional \$533,731.00 (Streetlights: \$324,965.00 + Roads and Sidewalk: \$69,266.00 + Traffic Signals: \$139,500.00) for the future replacement of streetlighting, road, sidewalk, and traffic signals for the Highway 404 Mid-Block Crossing;
- 5) THAT the 2018 Lifecycle Replacement and Capital Reserve study be updated to include a one-time payment for Markham’s share of the Ministry of Transportation’s (“MTO”) long-term maintenance and replacement cost for the Highway 404 Mid-Block Crossing structure to a maximum amount of \$1,731,333.33, being 33% of the total cost of \$5,194,000;
- 6) THAT the Mayor and Clerk be authorized to execute an agreement with the Town of Richmond Hill (“**Richmond Hill**”) for road surface maintenance of the Highway 404 Mid-Block Crossing structure, provided that the form and content of such agreement are satisfactory to the Chief Administrative Officer and the City Solicitor;

**HIGHWAY 404 RAMP EXTENSION AT HIGHWAY 7 (ARISTOTLE AVENUE) - (the “Highway 404 Ramp Extension”)**

- 7) THAT the Mayor and Clerk be authorized to execute an agreement with the Region of York (“**Region**”) to govern the design, property acquisition, project management, construction, operation, long-term maintenance and replacement of the Highway 404 Ramp Extension and cost sharing with respect to same, provided that the form and content of such agreement are satisfactory to the Chief Administrative Officer and the City Solicitor;
- 8) THAT staff be authorized to issue a Purchase Order to the Region, for 50% of the project costs for the Highway 404 Ramp Extension, to a maximum amount of \$12,900,012.58;
- 9) THAT the Engineering Department Capital Administration Fee in the amount of \$291,964.12, be charged and transferred to revenue account 640-998-8871 (Capital Admin Fees);
- 10) THAT the amount of \$1,698,193.64 (comprising a 20% contingency for project costs and the Region’s administration fees) be added to the budget for capital project #16041 ‘Highway 404 Ramp Extension, North of Hwy 7’;
- 11) THAT Markham’s portion of the project cost in the amount of \$14,890,170.34 (inclusive of the City’s Capital Administration Fee of \$291,964.12), be funded from the capital project #16041 ‘Highway 404 Ramp Extension, North of Hwy 7’ with an available budget of \$12,346,400 as outlined in this report;
- 12) THAT the additional financial requirement of \$2,543,770.34 (\$12,346,400.00 - \$14,890,170.34) be funded from the Development Charges Reserve;
- 13) THAT the 2018 operating budgets for the Asset Management Department (\$1,716.00) and Operations Department (\$25,396.04) be increased to cover annual operations and maintenance requirements for the Highway 404 Ramp Extension as set out in this report;
- 14) THAT the 2018 Lifecycle Replacement and Capital Reserve study be updated to include an additional \$192,890.00 (Streetlights: \$136,828.00 + Roads & Multi-Use Pathway: \$56,062.00) and financial program for the future replacement of streetlighting, underground stormwater facility, road and multi-use pathway for the Highway 404 Ramp Extension;
- 15) THAT the 2018 Lifecycle Replacement and Capital Reserve study be updated to include a one-time payment to the Region to a maximum amount of \$378,000, being 50% of MTO’s long-term maintenance and replacement cost for the Highway 404 Ramp Extension structure;

- 16) That in accordance with By-law 178-96, the lands legally described as Part of Block 9, Plan M-2029 designated as the Parts 6, 8, 11, 12 and 13 on Reference Plan 65R-36152 (the “**MTO Ramp Lands**”) be declared surplus to municipal purposes;
- 17) THAT subject to recommendation #16 and after the Highway 404 Ramp Extension is complete, the Mayor and Clerk be authorized to execute any documents and/or agreements required to transfer the MTO Ramp Lands to MTO for nominal consideration, provided that the form and content of such documents and agreements are satisfactory to the Chief Administrative Officer and the City Solicitor;
- 18) THAT after the Highway 404 Ramp Extension at Highway 7 is complete, the Mayor and Clerk be authorized to execute any documents and agreements required to acquire the lands legally described as Part of Block 9, Plan M-2029 designated as the Parts 1 and 3 on Reference Plan 65R-36152 (the “**City Ramp Lands**”) from the Region for nominal consideration, provided that the form and content of such documents and agreements are satisfactory to the Chief Administrative Officer and the City Solicitor;
- 19) THAT staff be authorized and directed to do all things necessary to give effect to this resolution.

**EXECUTIVE SUMMARY:**

The purposes of this report are to:

- (i) provide a project update on the Highway 404 Mid-Block Crossing and Highway 404 Ramp Extension;
- (ii) obtain Council authorization to issue a PO to the Region for 50% of the project cost for the Highway 404 Ramp Extension to a maximum amount of \$12,900,012.58;
- (iii) obtain Council authorization to fund the financial requirement of \$2,543,770.34 from the Development Charges Reserve;
- (iv) identify future operation, maintenance and replacement costs;
- (v) obtain Council authorization to convey and acquire real property; and
- (vi) obtain Council authorization to execute agreements to implement the staff recommendations.

The Region, Richmond Hill and the City have been working together on the design and construction of the Highway 404 Mid-Block Crossing and the Highway 404 Ramp Extension. The Region has been taking the lead on negotiations with MTO and construction. Currently, the agreement governing the terms for property acquisition, project management, construction, operation, long term maintenance and replacement, and the cost sharing arrangement is being finalized.

With respect to the Highway 404 Ramp Extension, there is a \$2,543,770.34 budget shortfall against the City’s approved budget. The shortfall is a result of the updated requirements received during detailed design since the environmental assessment phase

(see Table 2 of report). Upon completion, real property conveyances between the City, MTO and the Region will be required to reflect each jurisdiction boundary.

This report also outlines the City's long term operation, maintenance, and life cycle financial requirements, including the payment to MTO for the long term maintenance and replacement cost for the grade separated structures.

**PURPOSE:**

The purpose of this report is to provide a project update on the Highway 404 Mid-Block Crossing and Highway 404 Ramp Extension and to seek Council authorization for the following:

- to enter into an agreement with the Region to govern the design, property acquisition, project management, construction, operation, long-term maintenance and replacement and cost sharing of the Highway 404 Ramp Extension;
- to issue Purchase Order to the Region for 50% of the project costs for the Highway 404 Ramp Extension to a maximum amount of \$12,900,012.58;
- to increase the 2016 capital project #16041 'Highway 404 Ramp Extension, North of Hwy 7' to fund the additional financial requirement of \$2,543,770.34 for the Highway 404 Ramp Extension, to be funded from Development Charges;
- to include the annual operating costs for the Highway 404 Mid-Block Crossing and the Highway 404 Ramp Extension into the 2018 budget;
- update the 2018 Lifecycle Replacement and Capital Reserve study to include the replacement cost of the Highway 404 Mid-Block Crossing and Highway 404 Ramp Extension;
- update the 2018 Lifecycle Replacement and Capital Reserve study to include a one-time payment for Markham's share of MTO's long term maintenance and replacement cost for the Highway 404 Mid-Block Structure to a maximum amount of \$1,731,333.33 (33% of the total cost of \$5,194,000) and the Highway 404 Ramp Structure to a maximum amount of \$378,000.00 (50% of the total cost of \$756,000), and to issue such payments to the Region;
- to convey the MTO Ramp Lands to MTO and to acquire the City Ramp Lands from the Region for nominal consideration.

**BACKGROUND:**

Between Highway 7 and 16th Avenue, the arterial roads currently experience severe traffic congestion and the demand on the east-west road network is now above its capacity. The Markham Transportation Planning Study (June 2002), the Region's Mid-Block Crossing Study (2012) and Region's Transportation Master Study (2016) indicate that construction of a crossing of Highway 404 north of Highway 7 and a northbound ramp extension would help to achieve a better distribution of traffic demand by providing additional capacity to the network. The provision of additional road capacity is important given the significant congestion currently being experienced on Highway 7 and future development in the area including the re-development of the Buttonville airport lands.

Staff have been working with the Region and Richmond Hill on the design and construction of the Highway 404 Mid-Block Crossing and the Highway 404 Ramp Extension. Grade separated structures forming part of both the Highway 404 Mid-Block Crossing and the Highway 404 Ramp Extension will be constructed over Highway 404 and the realigned Highway 404 northbound ramp located on MTO's lands respectively. A sketch showing the location of the Highway 404 Mid-Block Crossing, the Highway 404 Ramp Extension and grade separated structures is included as Attachment "A".

#### **OPTIONS/ DISCUSSIONS:**

##### **A) HIGHWAY 404 MID-BLOCK CROSSING:**

Staff have previously reported to Council and obtained approval for the following:

- In June of 2010, Council passed a resolution to execute a cost sharing agreement with the Region and Richmond Hill for the design of the Highway 404 Mid-Block Crossing.
- On May 8, 2012 and April 23, 2013, Council authorized the execution of the Tri-Party Agreement to govern the terms for property acquisition, project management, construction, operation, long term maintenance and replacement, and cost sharing of the Highway 404 Mid-Block Crossing (the "**Tri-Party Agreement**"). Council also authorized staff to proceed with property acquisition and approved an annual payment to MTO in the amount of \$70,000 (1/3 of \$210,000) per year over a 100 year span (\$70,000/year x 100 years = \$7,000,000 total cost) for the long-term structure maintenance and replacement for the Highway 404 Mid-Block Crossing grade separated structure.
- On September 16, 2014, Council authorized the City to upfront the total cost for the relocation of utility facilities.

Staff are working with the Region and Richmond Hill to finalize the Tri-Party Agreement, which has been updated to reflect changes in the project. Originally, the City was the project lead but now, the Region has taken the project over for construction. This change was brought about because of MTO requirements. The Tri-Party Agreement will provide that all project costs of the Highway 404 Mid-Block Crossing be shared equally by the three parties.

#### **Operation and Maintenance Agreement between MTO and Region for Mid-Block Structure**

The Region has finalized and signed an agreement with MTO (the "**MTO Agreement**") on the long-term maintenance and replacement of the grade separated structures that forms part of the Highway 404 Mid-Block Crossing (the "**Mid Block Structure**") and the Highway 404 Ramp Extension (the "**Ramp Structure**") to be located on MTO Lands, shown in Attachment "A".

The MTO Agreement provides that the Region will be providing MTO with a one-time lump sum payment in 2018 for the long-term maintenance and replacement of the Mid-

Block Structure. The Tri-Party Agreement will provide that the Region, Richmond Hill and the City will share equally in the one-time payment for the Mid-Block Structure (1/3 each). After the one-time payment is made, MTO will be responsible for the costs of long-term maintenance and replacement of the Mid-Block Structure in perpetuity.

MTO will be preparing a life cycle study by April 2020 to estimate the cost of long-term maintenance and replacement for all municipal crossings of MTO highways. The one-time payment for the long term maintenance and replacement cost of the Mid Block Structure will be payable to the Region (to be paid to MTO on behalf of the City) and will be the lesser of the amount estimated in MTO's (lifecycle) study or \$5,194,000. The payment will be due when the life cycle study is completed. The City is responsible for 1/3 of the one-time payment to a maximum of \$1,733,333.33 (\$5,194,000/3).

In the Council report dated May 8, 2012, Council approved an annual payment to MTO of \$210,000 for long-term maintenance and replacement costs of the Mid-Block Structure, to be cost shared amongst the three parties. The City's share of this amount (1/3) was \$70,000 annually (\$210,000/3 for 100 years). This annual payment would be payable each year over the 100 year life cycle structure, which would equal \$7,000,000 (not including interest).

The Region has been negotiating with MTO to reduce the life cycle costs related to all the municipal crossings of MTO Highways. The most recent cost estimate from MTO has reduced the operations and maintenance requirement from \$21,000,000 to \$5,194,000. Staff conducted a Net Present Value (NPV) analysis, comparing the original \$70,000/year payment schedule versus the one-time payment to a maximum of \$1,731,333.33 and support the one-time payment as the more financially viable option.

MTO's agreement to accept the above noted maximum cap of \$5,194,000 on the long term maintenance and replacement cost is the result of Region's negotiations and represents significant cost savings to the City. Accordingly, staff recommend that Council approve the one-time lump sum payment to a maximum of \$1,731,333.33 payable to the Region (to be paid to MTO on behalf of the City) for the Mid-Block Structure and to include this amount in the 2018 Lifecycle Replacement and Capital Reserve study.

The City and Richmond Hill have been discussing the division of summer and winter road surface maintenance responsibilities on the Mid-Block Structure and will enter into a separate agreement to set out their obligations.

### **Operations and Maintenance Costs for Municipal Infrastructure**

#### **Operations Department**

Following construction, the City will be responsible for conducting road surface maintenance of the Highway 404 Mid-Block Crossing within its jurisdictions.

The Operations Department estimates that the annual cost of the operations and maintenance of the Highway 404 Mid-Block Crossing situated in the City's jurisdiction is

\$21,642.37 starting in 2018. It is recommended that the operating budget be adjusted annually to reflect all rates related to future contract awards/quotations or extensions.

In addition to the operations and maintenance cost as identified above, the Lifecycle Replacement and Capital Reserve study be updated to include an additional \$208,766 (\$69,266 + \$139,500) for the future replacement of sidewalks and traffic signals.

Asset Management Department

The Asset Management Department estimates that the annual cost of operations and maintenance cost for the streetlight system is \$3,388.00 starting in 2018.

In addition to the operations and maintenance cost as identified above, the Lifecycle Replacement and Capital Reserve study will need to be updated to include an additional \$324,965 for the future replacement of the poles and LED fixtures.

The proposed increase in the 2018 annual operations and maintenance costs and update to the Lifecycle Replacement and Capital Reserve study are set out in Attachment “B”.

Staff recommend that Council approve the proposed increase in the 2018 budget for the Operations Department and the Asset Management Department and the proposed update to the Lifecycle Replacement and Capital Reserve study.

***B) HIGHWAY 404 RAMP EXTENSION:***

Previously, the City planned to design and construct the Highway 404 Ramp Extension independently. A Municipal Class Environmental Assessment Study for the Highway 404 Ramp Extension at Highway 7 was approved in 2008. In 2013, the City put a hold on the project due to lack of funding from the Region and because MTO imposed a condition that the ramp extension be constructed for northbound traffic only.

Since 2013, the Region has taken the lead on this project and has successfully negotiated with MTO for a two-way ramp extension. On March 2015, Regional Council directed the Region’s staff to commence detailed design, property acquisition and construction of the Highway 404 Ramp Extension and authorized the Region to share project costs equally with the City. Following construction, the City will be responsible for the maintenance of the Highway 404 Ramp Extension located on the City’s lands. MTO will require a one-time lump sum payment for the long-term maintenance and replacement of the grade separated structure to be constructed over its lands. The City will need to enter into an agreement with the Region governing the design, property acquisition, project management, construction, operation, long term maintenance and replacement, and cost sharing of the Highway 404 Ramp Extension.

Construction

MTO has imposed a requirement on the Region to complete construction of the Mid-Block grade separated structure located over its lands by Spring 2017 so that MTO can

commence construction of a widening of Highway 404 within their schedule. On December 14, 2015, the Region issued a tender for the construction of both the Highway 404 Mid-Block Crossing and the Highway 404 Ramp Extension. Detailed design of the Highway 404 Ramp Extension had not been fully completed but the Region decided to award the tender for the Highway 404 Ramp Extension concurrently with the Highway 404 Mid-Block Crossing to meet MTO's deadline for construction.

The Region awarded the contract to the lowest bidder (Brennan Paving & Construction Ltd.) on March 1, 2016 and construction commenced on April 18, 2016. The anticipated overall construction completion for the Highway 404 Ramp Extension and the Highway 404 Mid-Block Crossing is Spring 2018.

### **Property Conveyance**

After it is completed, the City will have jurisdiction over the Highway 404 Ramp Extension, save and except the Ramp Structure, which will be under the jurisdiction of MTO. The City and the Region have both acquired real property for the construction of the Highway 404 Ramp Extension. After construction is completed, the City will need to convey the lands legally described as Part of Block 9, Plan M-2029 designated as the Parts 6, 8, 11, 12 and 13 on Reference Plan 65R-36152 to MTO. Also, the Region will need to convey the lands legally described as Part of Block 9, Plan M-2029 designated as the Parts 1 and 3 on Reference Plan 65R-36152 to the City. A table showing the foregoing land conveyances is in Attachment C. A sketch showing the location of the land to be conveyed is in Attachment D.

### **Agreements**

As indicated above, the Highway 404 Ramp Extension project is to be funded jointly by the Region and the City. The current City of Markham development charge background study (2013) identified that this project is to be fully funded by the City (100%).

As discussed in the above section on the Highway 404 Mid-Block Crossing, the MTO Agreement will govern the long-term maintenance and replacement of the Ramp Structure.

The Region and the City will also need to enter into an agreement governing the design, property acquisition, project management, construction, operation, long term maintenance and replacement, and cost sharing of the Highway 404 Ramp Extension. The Region has agreed to upfront the cost for the project and the City will be responsible for reimbursing the Region for 50% of the project cost following the execution of the agreement.

### **Highway 404 Ramp Extension Project Cost and Budget**

The following table shows the estimated total cost for the Highway 404 Ramp Extension based on the Region's contract. It also shows the City's share of such costs.

Table 1: Project Design and Construction Cost

<b>Ramp Extension at Highway 404 and Highway 7</b>		
<b>Item</b>	<b>Total</b>	<b>Markham Share (50%)</b>
Capital Project Works*	\$ 5,223,299.42	\$ 2,611,649.71
Capital Construction Works	\$ 15,728,064.96	\$ 7,864,032.48
Municipal Construction Works**	\$ 300,360.00	\$ 300,360.00
Contract Administration	\$ 1,597,641.60	\$ 798,820.80
<b>Sub-total:</b>	<b>\$ 22,849,365.98</b>	<b>\$ 11,574,862.99</b>
<b>Contingency (10% of Construction Works):</b>	\$ 1,602,842.99	\$ 816,439.25
<b>Admin Fees – York***</b>	\$ 1,004,204.8	\$ 508,710.34
<b>SUB-TOTAL:</b>	<b>\$ 25,456,413.28</b>	<b>\$ 12,900,012.58</b>
<b>Additional Contingency + Region Admin Fees (20% of Construction Works):</b>	\$ 3,333,913.42	\$ 1,698,193.64
<b>Admin Fees – Markham – 2%</b>	\$ 291,964.12	\$ 291,964.12
<b>GRAND TOTAL:</b>	<b>\$ 28,954,062.39</b>	<b>\$ 14,890,170.34</b>

\* Capital Project Works include detailed design, property acquisition and utility relocation

\*\* Municipal Works are estimated based on actual quantity within the City's jurisdiction (such as streetlight and sidewalk)

\*\*\* Fee of 4% of total project cost paid to the Region for tendering and administrating the construction contract and 4.5% for the Region administrating Capital Project Works.

The total project cost is \$28,954,062.39, of which, \$14,890,170.34 is Markham's share of the costs.

During the Class EA stage, the total project cost was estimated to be in the order of \$14,364,670. However, there have been a number of challenges that were identified during the detailed design stage which increased the project cost to \$28,954,062.39. The following are the list of challenges:

- Relocation of existing regional watermain (600mm in size and 435m in length)
- Additional real property requirements
- Multi-use pathway and wider lane width requirement by MTO
- Additional contingency costs associated with accelerating the tender and construction stage to comply with MTO's schedule
- Additional contract administration and engineering fees associated with the increased in scope of work

The new items not identified during the Class EA stage reflects about 50% of the original cost estimate for the project (\$14,589,392.39).

During the detailed design of the Highway 404 Mid-Block Crossing, the Region approached City staff and recommended that the Highway 404 Ramp Extension design be completed immediately and tendered concurrently with the Highway 404 Mid-Block Crossing. In addition, the Region's staff advised that the Region will fund 50% of the project cost of the Highway 404 Ramp Extension.

Council previously approved project #16041 in the amount of \$12,346,400.00 for the Highway 404 Ramp Extension. Given that the City's share of the project cost is now \$14,890,170.34, there is a budget shortfall of \$2,543,770.34. The 2013 DC Background Study shows the total project cost for the Hwy 404 Ramp Extension to be in the amount of \$14,364,670.00,

Table 2: Markham Project Cost Summary

<b>Item</b>	<b>Markham Share 50%</b>
City's Total Project Cost (A)	<b>\$ 14,890,170.34</b>
Approved Budget (Project 16041) (B)	\$ 12,346,400.00
<b>Budget Shortfall (C) = (A) – (B)</b>	<b>(\$ 2,543,770.34)</b>

\*Staff requests the Region of York to provide notification to the City for funding approval if the project cost exceeded PO amount prior to commencing work.

Based on the above, staff recommends that the budget be increased by \$2,543,770.34 to be funded from Development Charges and that the project cost for the Highway 404 Ramp Extension be revised in the next update of the Development Charges (DC) Background Study to reflect the new project cost (\$14,890,170.34).

### **Operation and Maintenance Agreement between MTO and Region for Ramp Structure**

The long-term maintenance and replacement of the Ramp Structure will be dealt with in the MTO Agreement in a manner similar to the Mid Block Structure. The Region will be responsible for paying a one-time lump sum payment to MTO in 2018, which amount would be shared equally between the Region and the City.

The agreement between the City and the Region on the construction of the Highway 404 Ramp Extension will provide that the Region and the City will share equally in such costs (1/2 each). After the one-time payment to MTO is made, MTO will be responsible for the costs of long-term maintenance and replacement of the Ramp Structure in perpetuity.

MTO will be preparing a life cycle study by April 2020 to estimate the cost of long-term maintenance and replacement for all municipal crossings of MTO highways. The one-time payment for the long term maintenance and replacement of the Ramp Structure payable to the Region (to be paid to MTO on behalf of the City) will be the lesser of the amount estimated in MTO's (lifecycle) study and \$756,000. The payment will be due when the life cycle study is completed. The City is responsible for 1/2 of the one-time payment to a maximum of \$378,000.

The Region has been negotiating with MTO to reduce the life cycle costs related to all the municipal crossings of MTO Highways. MTO's agreement to accept the above noted maximum cap of \$756,000 on the long term maintenance and replacement cost is the result of such negotiations and represents significant cost savings to the City. Staff recommend that Council approve the one-time lump sum maximum payment to MTO of

\$378,000 and to include this amount in the 2018 Lifecycle Replacement and Capital Reserve study.

### **Operations and Maintenance Costs for Municipal Infrastructures**

#### **Operations Department**

Following construction the City will be responsible for conducting road maintenance for the Highway 404 Ramp Extension.

The Operations Department estimates that the annual cost of the operations and maintenance of the Highway 404 Ramp Extension is \$25,396.04 starting in 2018. It is recommended that the operating budget be adjusted annually to reflect all rates related to future contract awards/quotations or extensions.

In addition to the operations and maintenance cost identified above, the Lifecycle Replacement and Capital Reserve study will need to be updated to include an additional \$56,062.00 for the future replacement of multi-use pathway.

#### **Asset Management Department**

The Asset Management Department estimates that the annual cost of operations and maintenance cost for the Highway 404 Ramp Extension is \$1,716.00 starting in 2018.

In addition to the operations and maintenance cost as identified above, the Life Cycle Reserve study will need to be updated to include \$136,828.00 for the future replacement of LED fixtures, streetlight poles, future underground stormwater facility maintenance and replacement.

The proposed increase in the 2018 annual operations and maintenance costs and update to the Lifecycle Replacement and Capital Reserve study are set out in Attachment "B".

Staff recommend that Council approve the proposed increase in the 2018 budget for the Operations Department and the Asset Management Department and the proposed update to the Lifecycle Replacement and Capital Reserve study.

### **FINANCIAL CONSIDERATIONS AND TEMPLATE:**

The total project cost for the Highway 404 Ramp Extension is \$28,954,062.39. The City's share (50%) of the cost for design, property acquisition, utility relocation and construction is estimated at \$12,900,012.58. Staff recommend issuing a Purchase Order to the Region for this amount. The Capital Administration Fees will be charged in the amount of \$291,964.12 to revenue account 640-998-8871. Staff recommend that the amount of \$1,698,193.64 (being comprised of contingency 20% contingency for project costs and the Region administration fees) be added to the project budget. Total cost to the City is \$14,890,170.34 (\$12,900,012.58 + 291,964.12 + 1,698,193.64)

Capital Budget #16041 – ‘Highway 404 Ramp Extension, North of Hwy 7’ was approved with a budget of \$12,346,400 to fund the Highway 404 Ramp Extension. The budget shortfall of \$2,543,770.34 (\$12,346,400 - \$14,890,170.34) will be funded from the Development Charges Reserve study. Staff request the 2016 Engineering Capital Budget (Account 083-5350-16040-005) be revised to include the additional \$2,543,770.34.

The Region requested a Purchase Order (PO) to include a contingency in the amount of 30% of the construction costs. Upon review by staff, it is recommended that a PO including a 10% contingency be issued to the Region and that if required, the CAO approve a maximum increase in the PO in the amount of 30% of the construction costs.

### Annual Operating Impact

Table 3: Annual Operating Cost Summary

Department	Item	Mid-Block (\$'s)	Ramp (\$'s)	Total (\$'s)
Operations	Road Maintenance - Summer	\$4,857.30	\$8,467.89	\$13,325.19
	Road Maintenance - Winter	\$8,527.02	\$14,865.44	\$23,392.46
	<b>Road Maintenance – Total (A)</b>	<b>\$13,384.32</b>	<b>\$23,333.33</b>	<b>\$36,717.65</b>
	Sidewalk Maintenance – Summer	\$332.59	\$323.59	\$656.18
	Sidewalk Maintenance - Winter	\$1,787.46	\$1,739.12	\$3,526.58
	<b>Sidewalk Maintenance – Total (B)</b>	<b>\$2,120.05</b>	<b>\$2,062.71</b>	<b>\$4,182.76</b>
	<b>Traffic Signals Maintenance – Total (C)</b>	<b>\$6,138</b>	<b>0</b>	<b>\$6,138</b>
	<b>Total Operations Impact</b>	<b>\$21,642.37</b>	<b>\$25,396.04</b>	<b>\$47,038.41</b>
Asset Management	Streetlighting	\$2,888.00	\$1,216.00	\$4,104.00
	Stormwater management	\$500.00	\$500.00	\$1,000.00
	<b>Total Operations Impact</b>	<b>\$3,388.00</b>	<b>\$1,716.00</b>	<b>\$5,104.00</b>
<b>Total Operating and Maintenance Costs</b>		<b>\$25,030.37</b>	<b>\$27,112.04</b>	<b>\$52,142.41</b>

\* (Source: Provided by Operations and Asset Management Departments)

The Operations and Maintenance Impact for the Highway 404 Mid-Block Crossing and the Highway 404 Ramp Extension of \$52,142.41 will be included as part of the 2018 operating budget process.

### Life Cycle Impact

The 2018 Lifecycle Replacement and Capital Reserve study update will include the future replacement of the following:

#### Highway 404 Mid-Block Crossing:

- Streetlights - \$324,965 (Luminaires - 20 yrs, Poles – 72 yrs)
- Roads and Sidewalk - \$69,266 (Road – 35 yrs, Sidewalk 39 yrs)
- Traffic Signals - \$139,500 (Signal Heads – 25 yrs, Controller – 20 yrs, Poles – 30 yrs, Pedestrian Station & Pre-emption – 10 Yrs, LED Indications – 7 yrs)
- Total \$533,731

Highway 404 Ramp Extension:

- Streetlights – \$136,828 (Luminaires - 20 yrs, Poles – 72 yrs)
- Roads & and Multi-Use Pathway - \$56,062 (Road – 35 yrs, Sidewalk 39 yrs)
- Total \$192,890

The total replacement value of is \$726,621 (\$533,731 + \$192,890).

**ALIGNMENT WITH STRATEGIC PRIORITIES:**

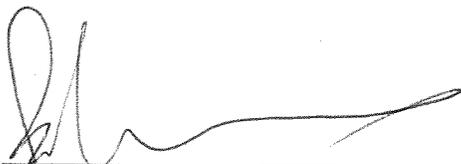
The construction of the Highway 404 Mid-Block Crossing and the Highway 404 Ramp Extension provides the necessary infrastructure, including sidewalks and bike lanes, to allow for the existing and future traffic and pedestrian movements with existing and future development. In addition, this construction will provide an increase in the level of service and improved traffic movement in the City of Markham, which in turn will reduce the traffic congestion in the corridor.

This project is in line with the City of Markham's strategic focus relating to Growth Management, Transportation/Transit, Safety, the Environment and Municipal Services.

**BUSINESS UNITS CONSULTED AND AFFECTED:**

The Operations, Asset Management, Finance and Legal Departments have been consulted and their comments have been incorporated.

**RECOMMENDED BY:**



Brian Lee, P. Eng.  
Director of Engineering



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

**ATTACHMENTS:**

Attachment 'A' – Site Location Plans

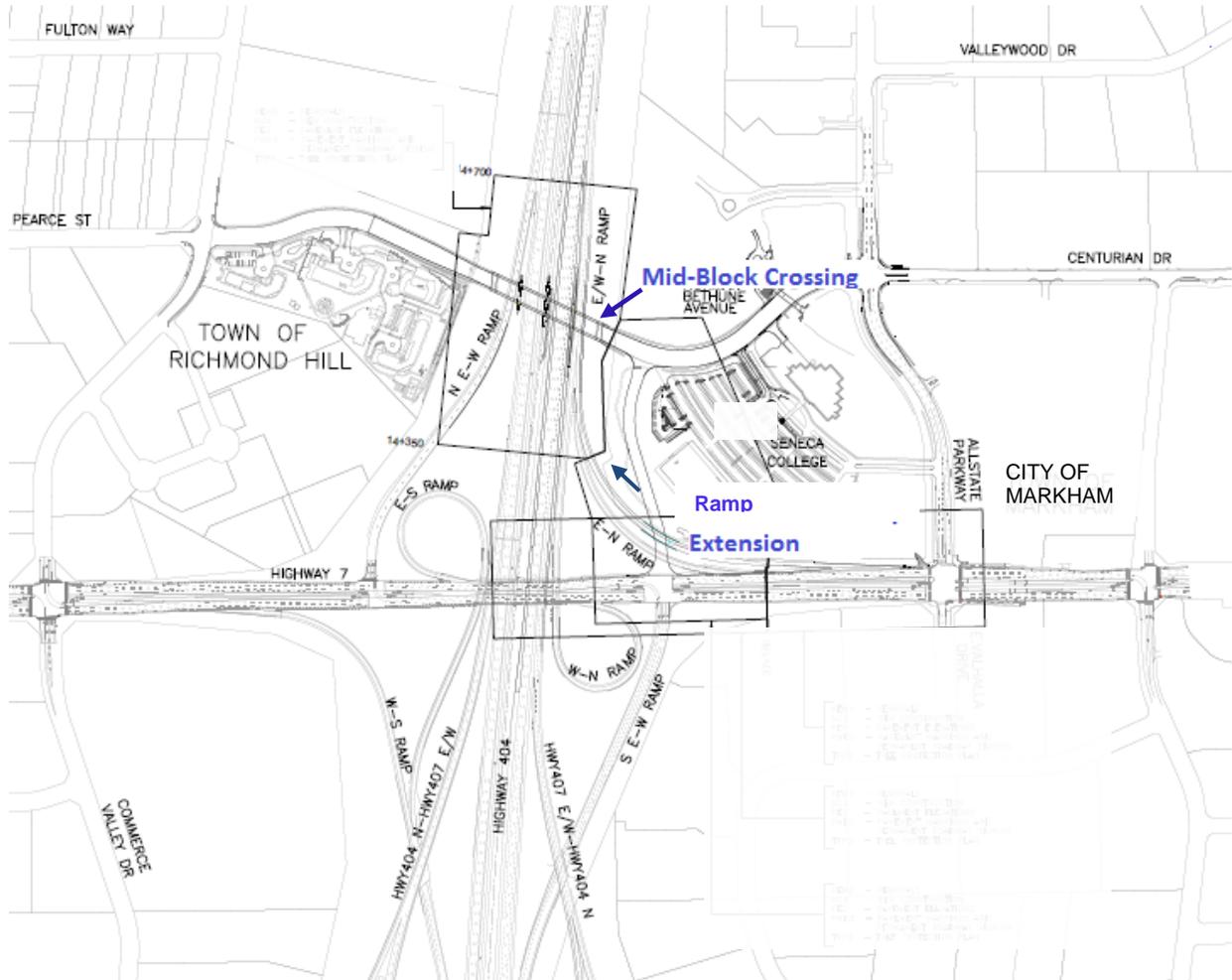
Attachment 'B' – Operation and Maintenance Annual and Life Cycle Cost

Attachment 'C' – Lands to be Conveyed

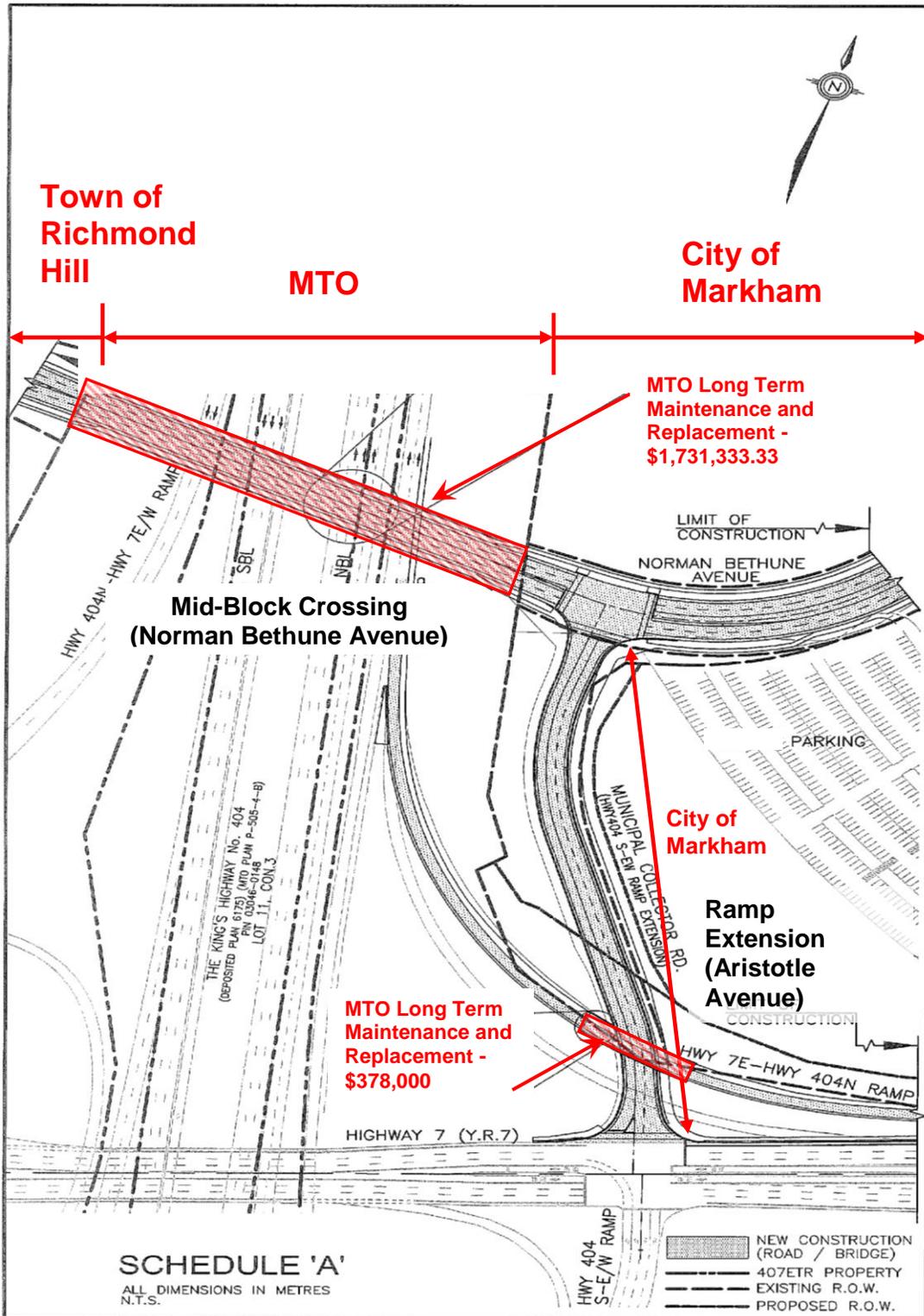
Attachment 'D' – Sketches of Lands to be Conveyed

**Attachment 'A'**  
**Site Location Plans**

**Map 1**



Map 2



**Attachment 'B'**  
**Operation and Maintenance Annual and Life Cycle Cost**

**A) HIGHWAY 404 MID-BLOCK CROSSING (NORMAN BETHUNE AVENUE)  
BETWEEN HIGHWAY 7 AND 16TH AVENUE**

**Operations and Maintenance Costs:**

The breakdown of future Operations and Asset Management costs are as follows:

Table 1: Annual Operating costs

Department	Item	Annual cost (\$'s)
<b>Operations</b>	Winter Maintenance of Road and Sidewalk	10,314.48
	Summer Maintenance of Road and Sidewalk	5,189.89
	Traffic Signals Maintenance	6,138.00
	<b>Sub-total</b>	<b>21,642.37</b>
<b>Asset Management</b>	Streetlighting - Annual Maintenance Cost	950.00
	Streetlighting - Annual Hydro Cost	1,938.00
	Stormwater Maintenance Cost	500.00
	<b>Sub-total</b>	<b>3,388.00</b>
<b>Total Operating and Maintenance Costs</b>		<b>25,030.37</b>

Note: Annual maintenance to commence in 2018.

**B) HIGHWAY 404 RAMP EXTENSION AT HWY 7 (ARISTOTLE AVENUE)**

**Operations and Maintenance Costs:**

The breakdown of future Operations and Asset Management costs are as follows:

Table 2: Annual Operating costs

Department	Item	Annual cost (\$'s)
<b>Operations</b>	Winter Maintenance of Road and Sidewalk	16,604.56
	Summer Maintenance of Road Sidewalk	8,791.48
	<b>Sub-total</b>	<b>25,396.04</b>
<b>Asset Management</b>	Streetlighting - Annual Maintenance Cost	400.00
	Streetlighting - Annual Hydro Cost	816.00
	Stormwater Maintenance Cost	500.00
	<b>Sub-total</b>	<b>1,716.00</b>
<b>Total Operating and Maintenance Costs</b>		<b>27,112.04</b>

Note: Annual maintenance to commence in 2018.

Table 3: Asset Management - Life Cycle Costs for Underground Stormwater Facility

<b>Program</b>	<b>Frequency (uninflated)</b>	<b>25 Years LC Impact (uninflated)</b>
Condition Inspection	\$2,000/every 2 years	\$25k
Sediment Cleaning	\$6,000/ every 10 years	\$15k
Rehabilitation (% of Replacement Cost)	At 15 Years: 5% - \$16,467.35; At 30 Years: 15% - \$49,402.05; At 50 Years: 30% - \$98,804.10; At 75 Years: 100% (Replacement) - \$329,347.00	Calculate based on construction cost*

\* Construction cost based on tender price of \$329,347.00

**Attachment 'C'**  
**Lands to be Conveyed**

Nov 08 2015 Draft R Plan Correlation against AECOM prop. Req. plan					Current Owner	"Seneca Deal" Label	Ultimate Owner	Purpose
Draft R Plan	Prop Req.	Area						
Part	Plan	m2	acres	hectares				
1	2	171.80	0.04245	0.01718	RY	TE TO FS	CM	Municipal ROW
2	2.1	248.00	0.06128	0.02480	Private	TE TO TE	Private	Private Land
3	1	1108.40	0.27390	0.11084	RY	FS	CM	Municipal ROW
4	6	6052.80	1.49571	0.60528	Private	TE	Private	Private Land
5	8	10414.90	2.57363	1.04149	Private	PTE	Private	Private Soccer Pitch
6	11	143.80	0.03553	0.01438	CM		MTO	MTO ROW
7	11	6.90	0.00171	0.00069	CM		MTO	MTO ROW / 1ft reserve
8	10.3	78.80	0.01947	0.00788	CM		MTO	MTO ROW / GM easement
9	11	0.20	0.00005	0.00002	CM		MTO	MTO ROW / 1ft reserve
10	10.2	62.50	0.01544	0.00625	CM		MTO	MTO ROW
11	9	1662.40	0.41080	0.16624	CM		MTO	MTO ROW MTO ROW / WM easement
12	10.1	478.60	0.11827	0.04786	CM		MTO	MTO ROW / GM easement
13	12	287.50	0.07104	0.02875	CM		MTO	MTO ROW / 1ft reserve
14	12	19.70	0.00487	0.00197	CM		MTO	MTO ROW / 1ft reserve
15	3.6	36.10	0.00892	0.00361	RY	FS	MTO	MTO ROW / 1ft reserve
16	3.1	1384.30	0.34207	0.13843	RY	FS	MTO	MTO ROW
17	3.6	785.40	0.19408	0.07854	RY	FS	MTO	MTO ROW / GM easement MTO ROW / WM easement
18	3.5	1242.80	0.30711	0.12428	RY	FS	MTO	MTO ROW / 1ft reserve
19	3.6	68.70	0.01698	0.00687	RY	FS	MTO	MTO ROW / GM easement MTO ROW / WM easement
20	3.2	40.00	0.00988	0.00400	RY	FS	MTO	MTO ROW
21	3.4	415.10	0.10258	0.04151	RY	FS	MTO	MTO ROW / 1ft reserve
22	3.3	325.70	0.08048	0.03257	RY	FS	MTO	MTO ROW
23	3.7	1035.90	0.25598	0.10359	RY	FS	MTO	MTO ROW
24	3.7	1.80	0.00044	0.00018	RY	FS	MTO	MTO ROW / 1ft reserve
25	3.7	18.60	0.00460	0.00186	RY	FS	MTO	MTO ROW
26	3.6	131.00	0.03237	0.01310	RY	FS	MTO	MTO ROW / GM easement MTO ROW / GM easement
27	3.5	36.10	0.00892	0.00361	RY	FS	MTO	MTO ROW / GM easement & WM easement

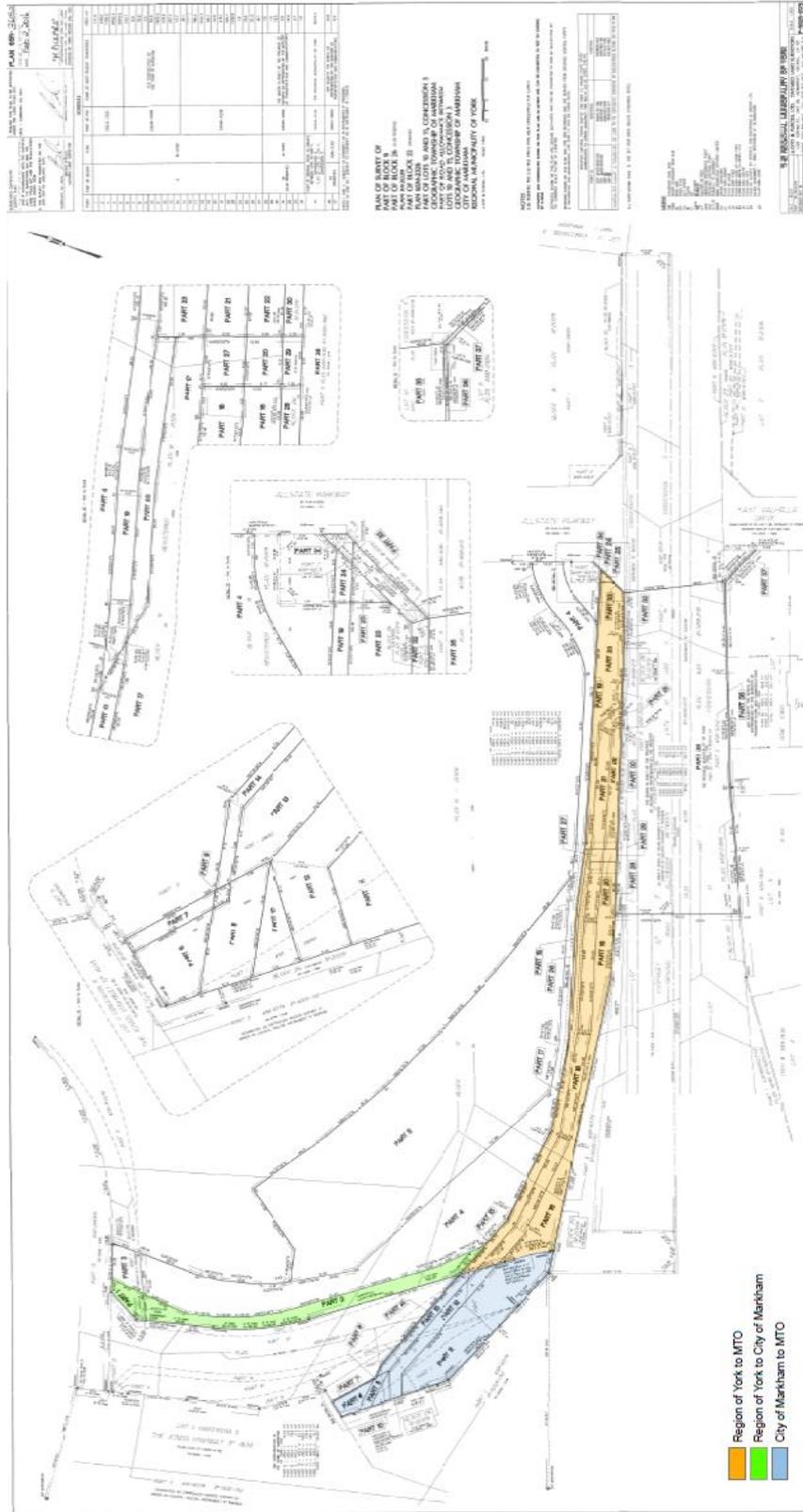
\*CM = City of Markham

RY = Region of York

MTO = Ministry of Transportation

# Attachment 'D' Sketches of Lands to be Conveyed

## R-Plan (65R-36152)



## Property Transfer

