MARKHAM

Report to: General Committee | Report Date: June 6, 2017

SUBJECT: Emerald Ash Borer 2016 Year End Summary

PREPARED BY: David Plant, Manager, Parks Operations, Ext. 4893

RECOMMENDATION:

1) THAT the staff report dated June 6, 2017 entitled "Emerald Ash Borer 2016 Year End Summary" be received AND
2) THAT staff be authorized and directed to do all things necessary to give effect to this resolution

PURPOSE:

The purpose of this report is to provide an update to Council regarding the 2016 year end results of the Emerald Ash Borer (EAB) program and inform target deliverables for 2017, the final year of the five year capital program.

BACKGROUND:

Initiated by the December 2013 ice storm, Markham's urban forest has suffered great losses, particularly our Ash trees. Long used as a well formed and reliable street and park tree, our Ash tree inventory was severely depleted. As a direct result of abundant Ash tree planting in the City, it became apparent that our limited tree diversity was going to leave complete neighborhoods devoid of tree canopy. The demonstrated fragility of the Ash trees infested by EAB, as well as the escalating demise of the species, left us no option but to focus the EAB program on citywide large scale removals starting in 2014.

DISCUSSION:

Trees are key components of the urban environment, contributing greatly not only to the quality of life in Markham, but providing essential environmental benefits. Trees contribute to air quality improvements; carbon sequestration; significant energy savings in heating and especially in cooling through hot summer months; enhanced property values; as well as storm water management, as trees soak up runoff that otherwise necessitates storm water infrastructure builds. Trees are now considered "green infrastructure" with quantitative, internationally-recognized capital valuations.

2013-2016 EAB MANAGEMENT PLAN ACTUALS:

1. Removals and Stumping

By the end of 2016, Operations completed the removal of 16,130 dead Ash trees and ground a total of 15,100 stumps to facilitate planting of replacement trees in all non woodland. The 2016 program presented challenges that we had never faced before, namely the realization of 100+ "utility stumps" located directly above buried lines which did not allow grinding to take place. The year ended strong with solutions in place to resolve our challenges, and positioned us to be successful in our 2017 planting efforts.

City staff has been very effective in managing this project by planning and awarding to multiple contractors to ensure deliverables are met. The standards developed by City staff for this project has provided the framework for other municipalities to use with respect to their EAB programs, a testament to Markham's leadership in Urban Forestry.

2. Planting

Markham's extensive replanting plan strengthens diversity of tree species, with over 50 species in the planting program. Diversity will help mitigate potential devastation due to urban forest pests or disease. Markham replanted 5,800 trees in 2016 just short of the target for planting 6,000 new trees due to an issue with utility lines below stumps in a few areas. This issue has been resolved for the 2017 program year with this shortfall being completed in the spring of 2017.

3. Woodland Assessments and Removals

In 2016 our strategy to manage EAB within the City's 1,200 hectares (1,800 locations) of woodland areas moved forward with very positive results. While not identified in the original capital project scope, risk assessments were completed for approximately 2,800 Ash trees which comprised the majority of nearly 4,300 total trees with high risk to people or property. These trees were marked for removal or pruning adjacent to trails, private properties, and buffer woodlands of manicured areas of parks. Favorable pricing for contracted services within the original project scope allowed the program to include these woodlands, while keeping within the original budget of $13.1M.

Contractors have currently completed removal of approximately 90% of hazardous trees. Trunk wood will generally remain in woodlands, where the wood will decompose to restore organic matter and nutrients to the soil. In some cases, trunks may be left to provide wildlife habitat. EAB infests live trees only, so the remnant debris will not harbor any more insects.

4. Tree Injections

In 2016, we undertook a comprehensive evaluation of our injection program and reported positive results. Our mortality assumptions for previously treated Ash trees did not align with actual results, suggesting that the continued treatment has been cumulatively more effective. We made the decision at the end of the 2016 program year to suspend treatment injections for 2017 so that we can evaluate mortality moving forward and allow the trees to recover from injection wounds. There are currently approximately 326 Ash trees which remain healthy within the City.

5. Tree Inventory

The tree inventory for the City wide street and park trees continued in 2016, with individual inventory records totaling over 200,000 trees. All work performed on each tree is now logged to create work records with history. Since 2015, Parks Forestry has recorded more than 45,000 work reports.

6. Communications

Positive feedback continued regarding the EAB communications efforts through 2016 with City arborists engaging the public at Tree Talks at numerous City events including Applefest, Unionville Festival, Milliken Childrens Festival and Canada Day celebrations. Strong communications plan also included portal updates, a strong social media campaign and print publications. Items for children such as temporary tattoos and colouring books helped to draw children with their parents to our displays.

2017 – YEAR 5 OF 5 EAB MANAGEMENT PLAN:

As we enter the final year of the EAB capital project, our EAB management strategies require minor ongoing refinements of factors such as pricing, availability, and survivability during the final year. Markham's EAB management plan has evolved to reflect changes in market conditions, shifting environmental factors, new treatment and monitoring options, and experiential knowledge.

With cost effective contracts in place to complete our scope of work in the final year, our focus has shifted beyond these activities to the ongoing maintenance of the 17,000 trees we have replaced, and how to reduce mortality rates with a proactive approach.

After experiencing a severe drought in the summer of 2016, combined with reduced snowfall amounts in the winter of 2015/16, staff are looking at longer term trends with a view to identifying precipitation trends. Through this examination, staff will develop a risk reduction strategy by way of a watering program to help our newly replaced canopy survive.

1. Annual Ash Tree Condition Re-assessment

Due to the nature of the EAB life cycle and Ash trees, each tree must be assessed immediately after leaf out in spring. As of the end of 2016, staff believe that all Ash trees City wide have been identified.

2. Tree Removal & Stumping Program

The City is planning on removing 400 dead and dying Ash trees in 2017 in streets and parks. A total of 2,710 stumps are targeted for grinding in preparation for new tree replacements for Fall plantings.

3. Replanting Program

Forestry staff has been challenged with continuously reworking planting plans to ensure diversity, as peak demand on nursery stock has resulted in depletion of several species. Our overall plan for diversity in species planted has been reworked several times in response to availability of good quality nursery stock as municipal demand within the province and south of the border increases. In 2017, another 4,500 trees will be planted, revitalizing once mature neighborhoods and restoring all of the ecological benefits that trees provide.

Tree replacements on City boulevards will continue with the intention to maintain the City standard 60mm caliper tree size, wherever available. Larger size trees have not been planted due to limitations of the size of the hole stumped in preparation for planting. Research shows that smaller caliper trees generally establish faster than larger trees, and catch up in size within a couple of years post-planting. Trees to be planted have been chosen from over 50 different species, with City arborists planning diligently to plant the "right tree in the right place" to optimize survivability in harsh boulevard conditions, as well as minimize conflicts with overhead utilities.

4. Woodland Removals

Woodland removals are on-target and are expected to be completed by year end 2017. We have gone through these woodland areas once and will perform the second round by the end of 2017.

5. Tree Injections

City arborists will continue to monitor our injected tree inventory through 2017 and evaluate viability as well as injection site wound recovery. The 5-10% mortality assumptions that we have used appear to be high when looking at the 2016 data.

6. All Tree Inventory and Risk Assessment

All City trees have now been inventoried and assessed, totaling over 155,000 trees on streets and 45,000 trees in maintained parklands. An inventory of significant trees (over 40cm in diameter and/or rare species) has been completed along trails and will continue around perimeters of woodlands which will be completed in 2017.

7. Corporate Communications

The EAB Communications Strategy continues to evolve in response to feedback from the public and Corporate Communications. The 2017 Communications Strategy will continue to provide a strong focus on educating private property owners to remove hazardous trees which have not been addressed in any City inventories. Actions will include:

- Markham "Tree Talks" – to continue at the most successful locations to engage citizens to discuss tree concerns with City arborists. Booths will be staffed at events and festivals, leveraging the presence of Fire and Emergency Services display to draw the public to our aerial bucket truck and display. From our past experiences we believe that this will provide a great opportunity to engage the public with City forestry staff in an approachable, friendly atmosphere
- Key messages updates on the City website
- Media releases including Markham Life and newspapers, and social media messaging
- Strong ethnic media communications
- Notices conveying information about removals and replanting programs are handed out to residents at the time of all work.
- EAB updates to Councillors and City staff to facilitate clear, concise and consistent explanations to residents
- 3 videos uploaded to the City portal and YouTube

- Continued encouragement of residents as partners including community tree planting

8. Private Trees

Public messaging by Corporate Communications will continue to provide information to encourage citizens to remove private Ash trees which pose risks for safety, in a timely manner. City staff will continue to expedite private property owners' requests for permits for private ash tree removals.

FINANCIAL CONSIDERATIONS AND TEMPLATE:

In 2013, staff presented the estimated total EAB program cost of $13.1M, which included trees on streets and in manicured areas of parks, and excluded woodlands as no data was available at that time.

EAB Program Summary

	Budget 2013-2016	Actual Cost 2013-2016	Remaining Budget 2013-2016	Program 2017	Total Project Favourable Variance 2013-2017
Total ($ M)	$ 13.1	$ 9.8	$ 3.3	$ 2.8	$ 0.5

The significant risks previously identified in woodland areas, along with hazardous trees on trails, in park buffer areas, and adjacent to private properties have been assessed and removed. While these costs were not included in the original estimate of $13.1M, favorable contract pricing throughout the project allowed us to include these areas within the original budget.

Several key factors have contributed to favorable program costs and facilitated the expanded program to include woodlands, while keeping within the original budget of $13.1M.

Approximately 2,000 ash trees were removed in 2014 due to the ice storm, and the associated costs were recovered, following submission to the Province for reimbursement. As well, the City received favorable pricing for contracted services related to tree removal, stumping and tree replanting which surpassed staff's expectations. Staff projects a positive variance of $0.5M at the end of the project or favorable by 4% of the total budget.

Council approved a 0.5% tax rate increase in 2013 to fund the EAB infestation, equivalent to annual funds of $0.59M. As part of the 2017 budget, Council approved using the Ramp-up Reserve to fund the remaining Emerald Ash Borer costs of $7,046,000 (as of end of 2016) and starting 2017, the 2013 Council approved

infrastructure surcharge of $590,000 for the Emerald Ash Borer program has been redirected to the Life Cycle Replacement and Capital Reserve.

FUTURE STEPS TO PROTECT OUR INVESTMENT:

The City's replanting of 17,000 trees is a large investment valued at $6.0M, when only the planting costs are considered. The overall health, condition, and ultimately the mortality of trees are highly dependent on how well its root system is established, particularly within the first few years after planting. In an effort to proactively protect the City's substantial investment, our planting contracts stipulate that contractors secure the trees with stakes to keep them straight, install Gator bags (slow release self watering reservoir) and mulch in the shape of a saucer around the base of the tree. The stakes help to train the tree to grow straight while developing its root system. The Gator bags, which are filled a minimum of six times per year by the contractor, combined with mulch, help retain water for the trees. As part of the final inspection the mulch is replenished by the contractor in the final year of warranty. Our planting contracts contain a two year warranty for tree plantings, which includes the replanting of a replacement tree should it not survive or meet the City's criteria as an acceptable tree at the end of the warranty period. A tree planted as a warranty replacement is provided only one additional year of warranty.

Based on Environment Canada data collected at Buttonville Airport, Markham has experienced significantly less than average precipitation in recent years. The historical 5-year average annual precipitation in Markham is 861.4mm per year. Markham experienced 16% and 21% less precipitation than the historical average in year 2015 and 2016, respectively. Despite the provisions within the contract, and precautions taken, the net result of two consecutive years of lower than average precipitation is that the newly planted trees will not have established an optimal root system. As the warranty only allows for one replanting per tree, and one additional year of warranty, some trees are only under the care of the contractor for half the time compared to those that survived.

In 2016, staff closely monitored the frequency of contractor watering for newly planted trees in order to help trees establish their root system and ensure their survival. Additionally, for the trees that were no longer covered by warranty, staff carried out a comprehensive watering program to mitigate the risk of losses during the significant drought of 2016. Staff will continue to perform inspections and condition assessments in 2017, and develop a fulsome plan proposed to mitigate the risks currently facing the newly planted trees. Staff will report back and establish next steps, which may include tree inspections, capital project auditing, a proactive watering and maintenance program, and replacement plantings where necessary, or any combination thereof.

HUMAN RESOURCES CONSIDERATIONS:

Additional contract staffing needs have enabled us to meet the accelerated program demands, and will continue through to the end of 2017.

ALIGNMENT WITH STRATEGIC PRIORITIES:
The Emerald Ash Borer Management Plan aligns with the goals and objectives of the Municipal Services Greenprint as well as Parks, Recreation, Culture and Library Master Plan components of Markham's strategic priorities.

BUSINESS UNITS CONSULTED AND AFFECTED:
Finance teams continue to assist with the program.

RECOMMENDED BY:

David Plant
Manager, Parks Operations

Morgan Jones
Director, Operations

Brenda Librecz
Commissioner, Community & Fire Services

ATTACHMENTS:
Presentation