The Corporation of the Town of Milton

Report To:	Council
From:	M. Paul Cripps, P. Eng., Commissioner, Engineering Services
Date:	September 24, 2018
Report No:	ENG-020-18
Subject:	2018 Fall Forestry Update Report

Recommendation: **THAT Council receive this forestry update report highlighting works completed over the year, high level tree inventory data interpretation and future forestry management considerations;**

AND THAT Council approve delegated authority to the Commissioner, Engineering Services to authorize agreements enabling various organizations, and their volunteers, on Town owned lands for tree planting and clean-up activities in Town naturalized areas moving forward, subject to indemnification agreements being signed and insurance being secured for such activities;

AND FURTHER THAT the Mayor and the Town Clerk be authorized to execute any necessary documentation or agreements.

EXECUTIVE SUMMARY

Over 2018, Town staff have been increasing both our in-house forestry capabilities and our contractor works to address pressing forest management requirements. This report will highlight our projects performed over the year, introduce some preliminary information resulting from the Town's tree inventory data collection and will touch on some upcoming potential projects and proposals. This report provides an update to ENG-005-18 as staff identified that further information would be provided to Council once we received the completed tree inventory data set from our consultant.

REPORT

Background

Forestry Staff

The following works have been accomplished by dedicated forestry staff this year:

- A tree inventory featuring approximately 50,000 data points (existing and proposed trees) has been accomplished to assist staff in making “data driven” proactive decisions. Staff will use the inventory to continue to strive towards creating a more systematic, proactive approach to larger forestry programs and less reactive approaches to forestry work.
- In 2018, to date, 774 new street trees have been planted.
- An urban tree pruning program is underway to try and catch up with the back log of clearance tree issues accumulated after 15+ years of growth, with the ultimate goal of a proactive neighbourhood by neighbourhood pruning program on a five to ten year cycle.
- An urban juvenile tree watering program has been initiated to reduce tree mortality and urban canopy loss and assist with growth and development of trees at this critical stage of their lives.
- Approximately 223 ash trees have been treated with TreeAzin to continue a “successional approach” to large ash tree removals, leaving approximately 25 large urban ash trees with 30% or more dieback to be removed and replaced this fall.
- Of the 1276 service requests directed to the Operations division in the first six months of this year, 366 (or 29%) of those requests were directly related to forestry. These service requests were over and above our regularly scheduled programs and include street tree health concerns, requests to remove dead trees, wind and ice storm clean-up, sightline issues, pruning and tree planting requests, etc. Considering the volume of tree related service requests, it is important to note that the forestry division operates primarily with a limited, seasonal staff complement that is only available during a four month window. This staffing limitation creates challenges in addressing all service requests received, in addition to our regularly scheduled programs.
- Systematic “brushing” has been undertaken in select rural roads that are now undergoing surface treatments. Unfortunately, current budgets enable staff to only pre-clear approximately half of the roads needed prior to surface treatment works.
- Ash, dead trees and trees with potential risk hazards along rural roads are being removed based on priority and risk.
- Critical site triangle clearing has been performed at various rural intersections (both Town and Region-owned right-of-ways per our MOU with the Region).
- Regional forestry service requests are being addressed per the MOU between the Town and Halton Region.
- Warranty trees planted in 2016 have been replaced.
- Warranty trees from 2017 are currently being mulched, watered and straightened where required and warranty tree replacements will be undertaken in the fall.
- Staff have been trained on Book 7 traffic control and select staff attended a two day chainsaw safety course hosted by the Town. Both courses have been

pursued in an effort to expand our in-house capabilities with an eye to creating a “blended approach” to our programs and finding whatever efficiencies we can with an appropriate in-house labour vs. contractor labour balance.

Despite the successes this year and the scope of what staff have achieved, there are still many challenges to face with the forestry portfolio. The goal is to eventually become more proactive, turn around service requests quicker and advance towards stable cyclical programs that run concurrently (e.g. pruning, watering and mulching programs, removals and planting, etc.). With the large volume of service requests and backlog of “catch up,” we have not reached the ideal proactive goal yet for all aspects of our work, but we are working diligently to move towards a comprehensive, proactive approach across all our endeavours, which will help improve the Town’s forest assets, mitigate risk, increase efficiency and cost effectiveness.

Primary Forestry Goals Moving Forward
(Pending annual Council budget approvals)

1. Three year systematic removals of both Town and Region (per the MOU) dead, ash, diseased elm and potential hazard trees along rural road right-of-ways;
2. Rural cyclical pruning and clearing on a five-ten year program;
3. Urban cyclical pruning and clearing on a five-ten year program;
4. Rural brushing to cover all roads requiring surface treatment on an annual basis;
5. Annual urban cyclical mulching and watering of juvenile street and park trees;
6. Woodlot and naturalized area cyclical pruning and clearing on a five-ten year program;
7. Planting approximately 1000 street trees every year for the next ten years subject to budget approval;
8. Planting approximately 200 park trees every year for the next ten years subject to budget approval;
9. EAB treatments and removals of over 223 trees (over 2019 and 2020) to further pursue a successful successional approach to removals and replacements of large ash trees we are treating;
10. Work closely with by-law staff to ensure that known private hazards (that may impact Town assets) are dealt with systematically (e.g. letters to residents to manage private trees that are potentially impacting Town right-of-ways and other Town-owned lands);
11. Work towards an appropriate balance of in-house vs. contract work to ensure that forestry work is accomplished using the most efficient and effective use of budgets and staff labour available.

Tree Inventory
As previously discussed through ENG-013-17 a portion of the funds within the 2017 EAB Implementation Strategy project (C33013417) were directed towards completing an inventory study for trees located on Town-owned properties and right-of-ways.

As of the end of July, the complete inventory data set has been provided to the Town by our consultant. Quality of data has been verified by staff. The data is useable on GIS based platforms and can be available on tablets for field use.

The ultimate goal of the data is to have the inventory connect to our AMANDA system (service request management software) and switch to an efficient paperless work order system (to the greatest extent possible). Forestry staff are working with our counterparts in IT to assist with our gradual move in this direction. Converting to a digital approach will allow for “real time” assessments of our forestry assets.

Attached to this document is Appendix A – Tree Inventory Data Maps. Forestry staff have worked closely with IT staff to create a high level picture of the “State of the Union” in terms of forestry assets. Further interpretation information related to Appendix A is found under the “Discussion” heading below.

Volunteer Work
Town staff had a very successful spring woodlot clean up at Meighen Woodlot by Field and Stream Rescue Team and local volunteers. The cleanup and tree planting initiatives completed over the past few years have been very successful. They have been a great outlet where Town staff can work closely with the community and other partners to make things better for all involved and the community at large.

Town staff have been approached to work with other organizations and volunteers this fall such as Conservation Halton, local schools and Union Gas, on planting projects in a couple of different locations. Staff are interested in accommodating such requests, however, with volunteer projects, timing of the work can be in flux and often times plans do not come together with appropriate lead time required to send it all adequately completed for Council approval and signature of the Mayor and Town clerk prior to the event.

As a result, staff requests approval from Council that the Commissioner of Engineering Services have delegated authority to authorize agreements with our volunteer groups for both our volunteer clean-up projects and tree planting initiatives. We have in place agreement templates that indemnify the Town. The agreements used are approved by risk management staff and will continue to be run by such staff prior to moving ahead with each individual project.

Discussion

Tree Inventory Data Interpretation for Appendix A
Town staff have had Aboud and Associates Inc. conduct an inventory of our trees with the understanding that the data will assist with proactive management approaches to our valuable forestry assets. The following information will explain what the maps in Appendix A represent and what the tree inventory data tells us:

Map 1: Overall Rural Map
Town staff have divided the rural areas into three management sections based on a general assumption of scope of risk per section (e.g. more forested in the north vs. more farmland in the south, etc.).

All of the data "dots" in the rural areas represent trees that are potentially in need of removal along all of our rural road right-of-ways based on our third party independent assessment.

In the rural areas it was practical to scope the inventory to depict data representing ash, elm, dead and potential hazards (trees that will ultimately require removal due to decline, risk, pests and proximately to Town right-of-ways).

Based on the inventory, there are approximately 4,252 trees in the rural area that should be removed in the next few years. The vast majority of these trees being ash trees. This number does not include the hamlets, 401 Business Park and some right-of-way (ROW) areas that Town staff have cleared of hazards so far this year. Hamlet data is primarily trees in good condition. It is the rural ROW data shown that requires a concentrated effort of systematic, road segment by road segment, removals.

Town staff recommend that these trees be systematically removed over a three year period in order to manage all known potential risks pertaining to safety along the rural road right-of-ways. Once the risks are mitigated, Town staff will be able to then create a five to ten year cyclical pruning approach moving forward. The costs to remove the noted trees are discussed in the "Financial Impact" section below.

Map 2: Rural Section 1
Town staff have been clearing high risk areas of ash, potential hazards and declining elm and other declining species and have been systematically clearing various road segments such as Sixth Line Nassagaweya from No. 5 Side Road to No. 20 Side Road. Staff have been working with Purchasing and Risk Management staff and our blanket contractor to mitigate high risk areas. There are approximately 2,752 further tree removals required once our current removals are complete. Staff recommend that such trees be cleared over the course of 2019.

Map 3: Rural Section 2
Based on the data there are approximately 965 trees to remove in rural section 2. Staff recommend that we systematically remove such trees in this section in 2020. This recommendation does not negate the fact that staff may need to advance removals should imminent risk concerns arise in Section 3 while focusing on Section 2.

Map 4: Rural Section 3
Based on the data there are approximately 535 trees to remove in rural section 3. Staff recommend that we systematically remove such trees in this section in 2021. Again, this approach does not negate the fact that staff may need to mitigate areas within Section 3 prior to that date based on risk concerns.

Map 5: 401 Industrial Business Park
The data indicates that we currently have 686 trees in the right-of-ways of the 401 Industrial Business Park. Our consultants found opportunities for 773 additional trees to be planted. There may be some constraints based on specific road profiles but the data clearly indicates that we have an opportunity to double our forest assets in this area.

Map 6: Established Urban Area
The noted area represents Milton boundaries prior to the Bristol, Sherwood and Boyne surveys developing. Most of the ash in this urban area have been removed as a result of the Emerald Ash Borer. As we replace trees we are working to increase species cultivar diversity. This will make the urban forest more resilient if other pests and diseases such as Dutch Elm disease or Emerald Ash Borer arise. In all new developments we are shooting for a range of having no more than 5%-6% of any one species cultivar represented. As you can see we still have 25% Norway maple and 11% honey locust above that 5%-6% mark (trees that have been established over several decades).

Trees such as ash, Norway maple and honey locust are extremely tough urban trees and that is why urban forest managers used to overuse them along our streetscapes. We know now that the “monocultured” approach exposes the urban forest to potential pests, diseases, etc. Diversifying species means more care and management upfront of juvenile trees (pruning, watering, etc.) but it will pay off in the long run when we have a mature, resilient and diverse urban forest. The forestry work we do today will pay huge dividends for future generations and hopefully help us avoid massive losses of trees when pests and diseases strike.

Map 7: Bristol Survey – Residential
In 2007 development was well underway in this survey. Upon understanding that EAB would not stop advancing and would make its way to Milton, staff placed a moratorium on all future ash plantings. There were still many ash trees to remove and replace in

this area. As a result of the diversification approach, we have three species at 6% and the remaining at less than 5% species cultivar representation. This urban forest is very much in line with what we need to achieve. But note also that we have the opportunity to plant over 2000 additional trees and there is also much work to be done in terms of systematic cyclical pruning, watering, mulching, stake removals, etc.

It is important to note that for the Established Urban Area, Bristol and Sherwood surveys, the inventory was scoped to include only areas requiring extensive management by the Town (e.g. street trees, trails, park and park pathways, etc.) and does not include the tens of thousands of trees in 16 Mile Creek, interior to woodlots and interior to engineered channels etc. This is done deliberately to assess immediate management needs and set data points where trees exist, trees are required, ongoing work is required, etc. that are all under our day to day management regime.

Map 8: Sherwood Survey – Residential

Again, Sherwood serves as an example of a more appropriate and resilient forest. There are several anticipated plantings and a requirement of ongoing cyclical care and maintenance of this urban forest segment to ensure that we achieve the best results of what this forest can be as it matures and develops.

What the Tree Data Maps Tell Us (generally)

1. There are approximately 4,252 trees to remove throughout rural Milton at a cost of approximately $240.00 each, plus tax (the $240 being a value based on the removal of multiple trees in a road segment (allowing for efficiencies of scale, and is derived utilizing present costs). In rural section 1 there are approximately 2,752 trees to remove. In rural section 2 there are approximately 965 trees to remove. In rural section 3 there are approximately 535 trees to remove.

2. Overall, the Town has planting opportunities for over 4000 new trees on our road right-of-ways. If we factor in a very conservative value of 500 regular street trees to plant (that are replacement trees) on an annual basis and allocate the 4000 trees over 8 years, the Town (very conservatively) should be planting approximately 1000 street trees per year for the next 8 years. Town staff may be able to drive down such numbers as we continue with in-house watering, mulching and pruning and overall cyclical forestry care. However, new development as the Town grows will put further upward pressure on that value as well keeping it in the 1000+ plus range for the first 8-10 years and growing as developments are assumed by the Town and new Secondary Plans are built out.

3. The forest is relatively young while at the same time we have many century old trees to care for in the established area that are nearing the end of their respective life cycles. This continues to speak to the need of cyclical in-house care and maintenance which will allow for trees to make it through their critical juvenile stage in their respective life cycles as well as allowing us to highlight any risks in older trees and mitigate such risk appropriately.

4. We have made great strides in diversifying species so that the urban forest is more resilient to pests and diseases (which are often more destructive on "monocultured" plantings such as what we have seen with ash and elm over the past 60 years). We are diversifying species, however, diversification presents its own challenges such as availability, zone hardiness, tenderness and sensitivity to urban conditions, salt tolerance, etc. We are working through those issues with our contractors and confirming solutions with our colleagues across the municipal sector, conservation authorities and academia to hone in on the most appropriate mix of species and approach to forestry management.

In summary, the tree inventory gives staff a very good snap shot of our total scope of work across the vast geographic area of our responsibility. Having it all laid out allows us to manage the Town's forests project by project, in order of importance, to utilize our resources effectively and to mitigate risk to the greatest extent possible.

Financial Impact

There are approximately 4,252 trees in the rural area that are recommended to be removed based on the results of the inventory study. It is estimated that the cost to remove these trees would be approximately $1.1Million and ideally these removals would take place systematically over a three year period.

In the urban area there are 248 treated ash trees remaining. Of this amount it is expected that 25 will need to be removed and replaced before the end of the year due to their condition. The remaining 223 were treated with TreeAzin in 2018 to prolong their life. This work is being undertaken within the previously approved budget of $107,188 for the 2018 EAB Implementation Strategy (C33013418).

Of the remaining 223 urban trees it is expected that 66 will need to be removed and replaced in 2019 with the balance being treated once again for the disease in that same year. It is recommended that the final 157 trees be removed and replaced in 2020. However, the health of these trees will be assessed annually. The cost of treating, removing and replacing the 223 trees over a two year period is estimated to be $450,000.

The above mentioned programs will complete the removal of all remaining ash trees in the Town. Staff intend to incorporate these programs into the 2019 capital budget and

forecast subject to project prioritizations, funding constraints and ultimately Council approval.

All other tree removals not identified through the inventory study, such as emergency removals, will be managed through the tree maintenance program within the operating budget. Similarly, tree replacements excluding the aforementioned urban ash tree replacements will be managed within the operating budget and subject to annual budget constraints. In 2018 the total operating budget for forestry activities (both internally and externally provided) amounts to $1,099,306.

Respectfully submitted,

M. Paul Cripps, P. Eng.
Commissioner, Engineering Services

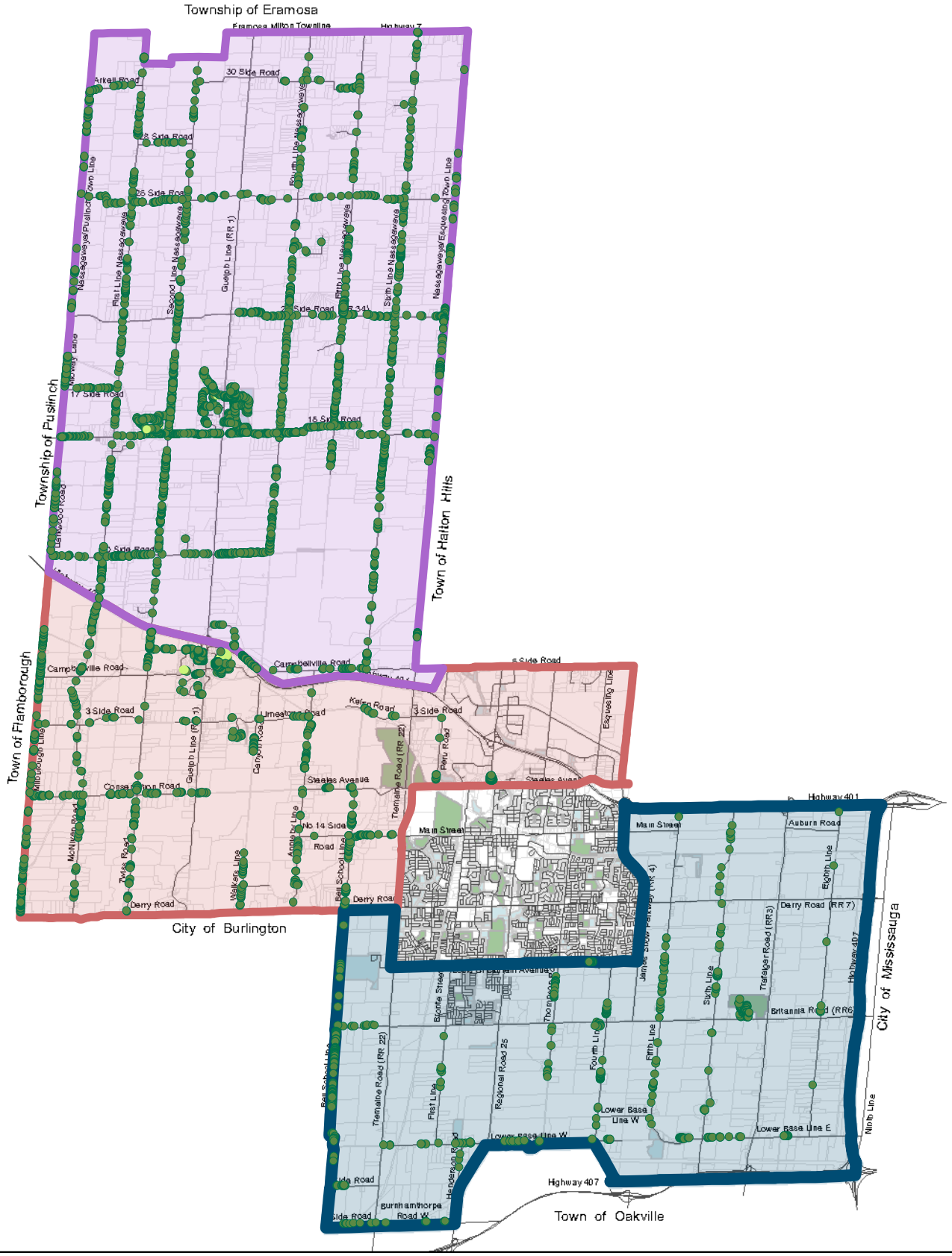
For questions, please contact:	Jon Meyer, Manager of Forestry & Horticulture	905-878-7252 x2556

Attachments
Appendix A – Tree Inventory Data Maps

CAO Approval
William Mann, MCIP, RPP, OALA, CSLA, MCIF, RPF
Chief Administrative Officer

Map 1 - Overall Rural

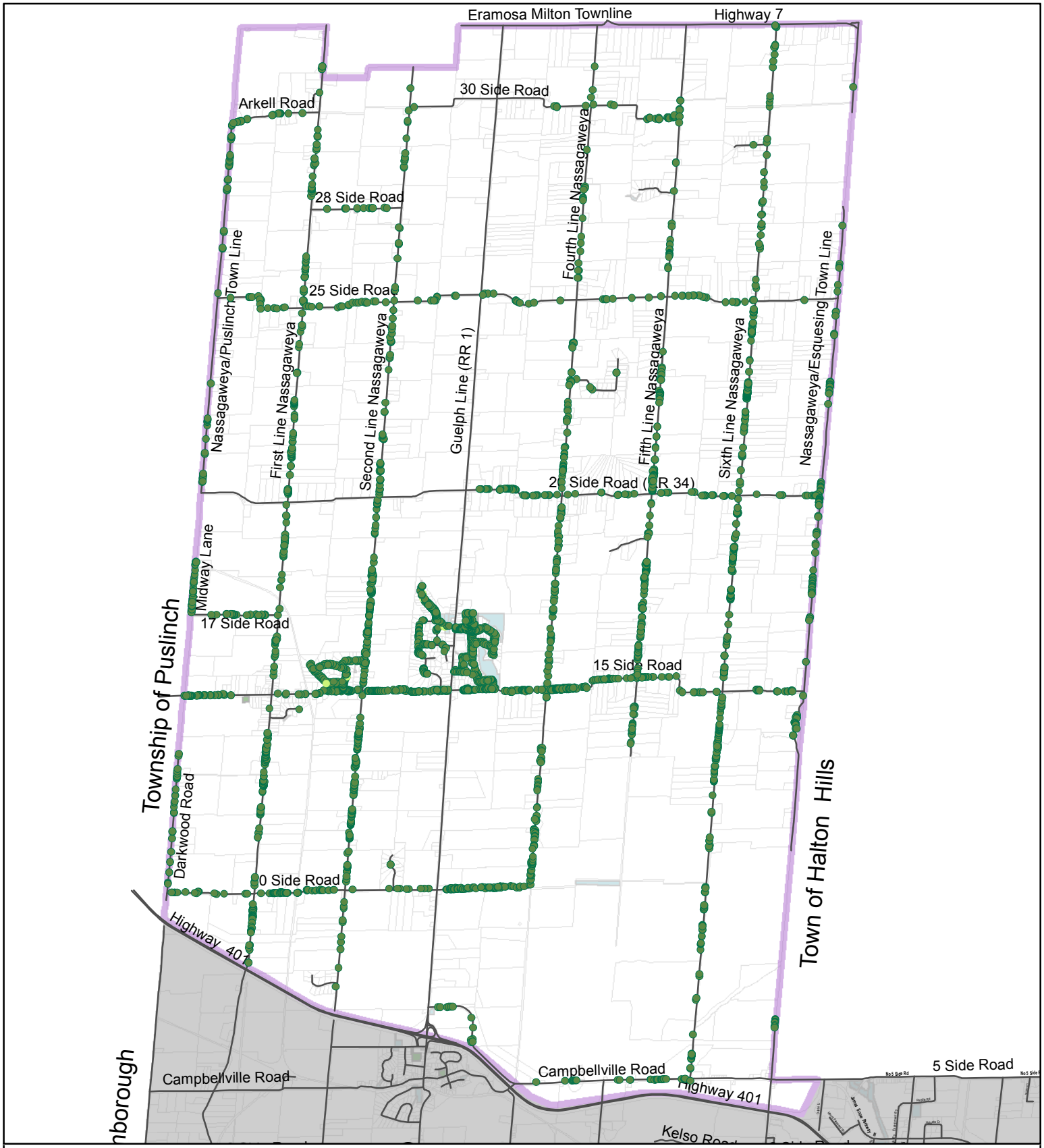
Appendix A



Excludes Moffat, Brookville, Sixth Line (from Campbellville Road to No 20 Side Road), Campbellville, the 401 Industrial Business Park, Drumquin Park and associcated woodlot. Includes a 10% contingency on tree values.

Apprendix A

Map 2 - Rural Section 1



Section 1
Parks
Town Lands

Potential Removals (**2752 trees)
Potential Plantings In Hamlets (9 trees)

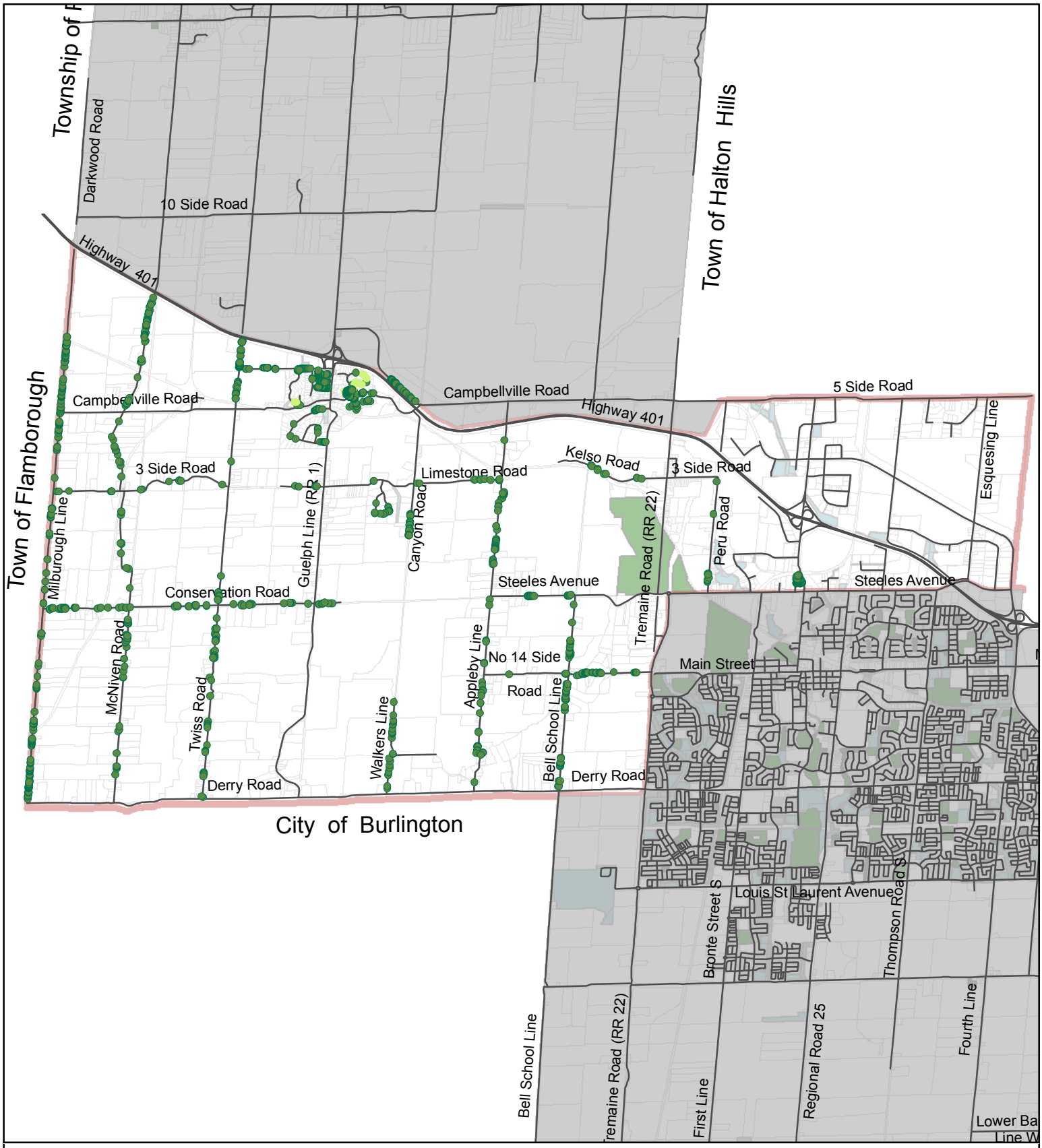
***Excludes Moffat, Brookville &
Sixth Line Nassagaweya (from Campbellville Road to No 20 Side Road).
Includes a 10% contingency on tree values.***

0 625 1,250 2,500 3,750 5,000 Meters

MILTON

Map 3 - Rural Section 2

Appendix A



Section 2
Parks
Town Lands

Potential Removals (**965 trees)
Potential Plantings in Cambellville (39 trees)

Excludes Campbellville and the 401 Industiral Business Park. Includes a 10% contingency on tree values.

0 625 1,250 2,500 3,750 5,000 Meters

Apprendix A

Map 4 - Rural Section 3

Section 3
Parks
Town Lands

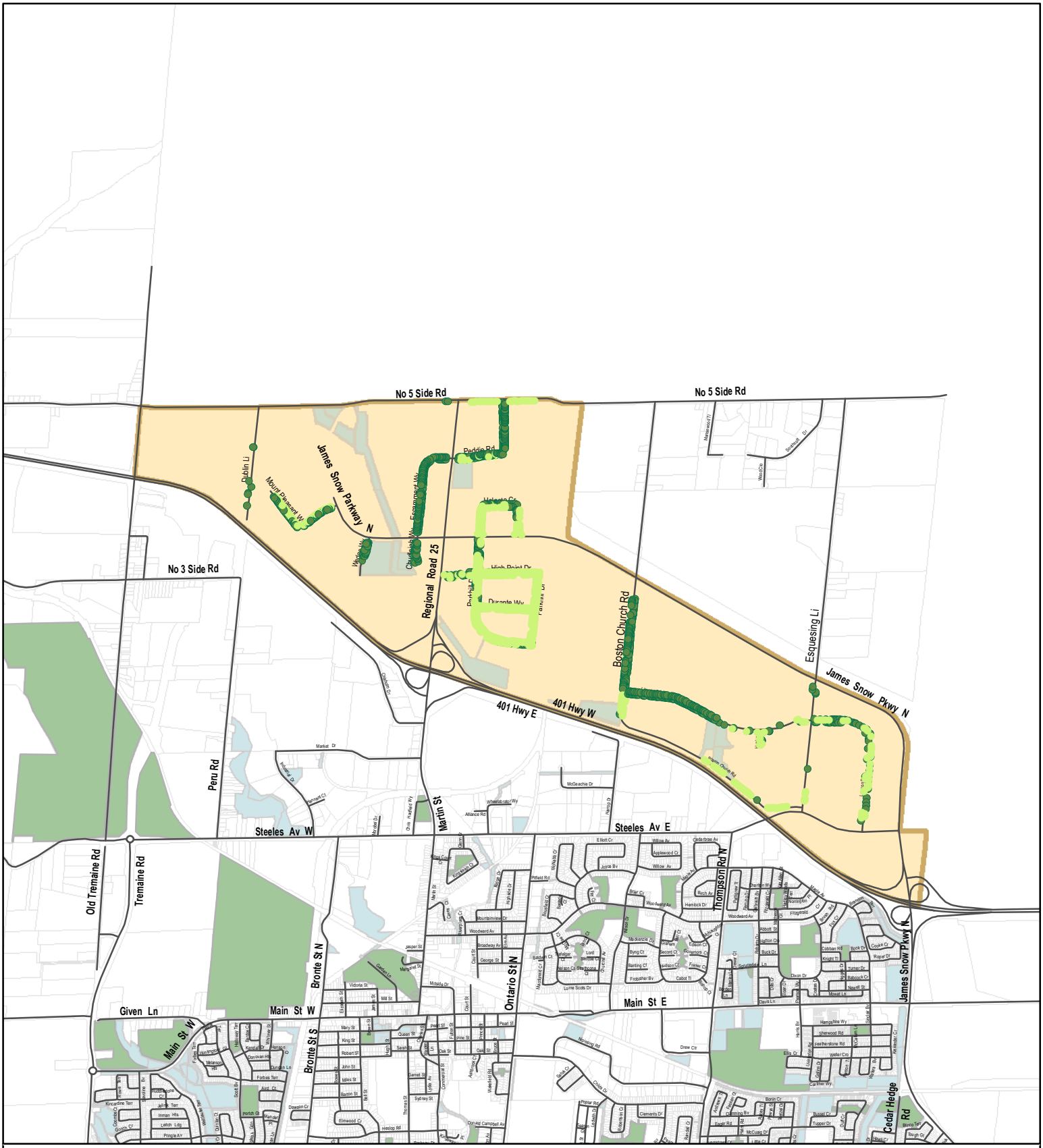
Potential Removals (**535 trees)
Potential Plantings (0 trees)

Excludes Drumquin Park and Associated Woodlot. Includes a 10% contingency on tree values.

Meters
0 625 1,250 2,500 3,750 5,000

Apprendix A

Map 5 - 401 Industrial Business Park



401 Industrial Business Park
Parks
Town Lands
Trees (686 trees)
Potential Plantings (773 trees)

Top 5 Species Cultivars and Percentages (rounded)

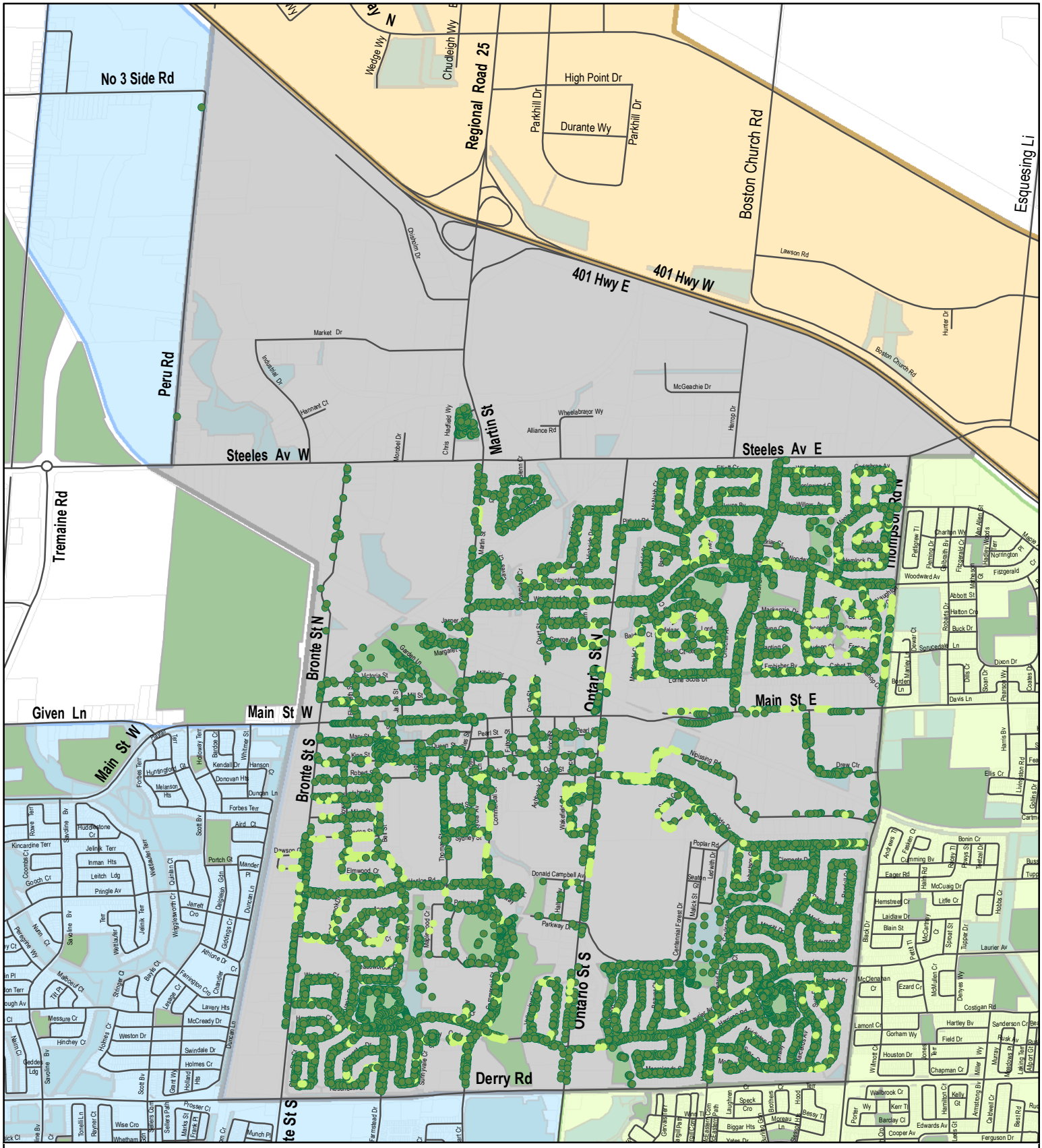
1) Honey Locust (Thornless) - 18%
2) Red Maple - 12%
3) Sugar Maple - 11%
4) Red Oak - 9%
5) Japanese Tree Lilac - 6%

The remaining 44% represents less than 5.5% for each cultivar

0 250 500 1,000 1,500 2,000 Meters

Apprendix A

Map 6 - Established Urban Area



Established Urban Area
Parks
Town Lands

Trees (7922 trees)
Potential Plantings (673 trees)

Top 5 Species Cultivars and Percentages (rounded)

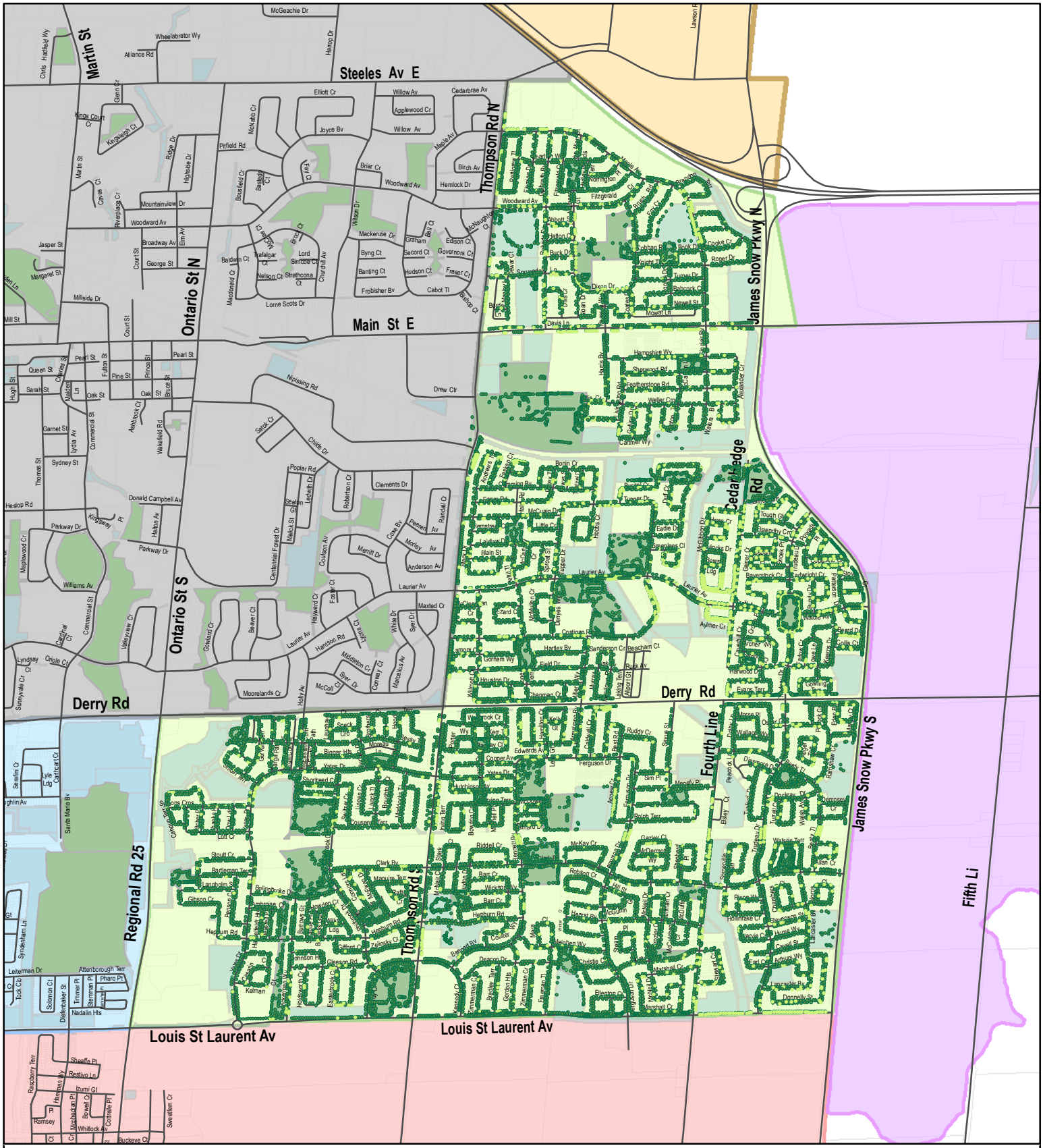
1) Norway Maple - 25%
2) Honey Locust (Thornless) - 11%
3) Sugar Maple - 5%
4) Austrian Pine - 4%
5) Autumn Blaze Maple - 4%

The remaining 51% represents less than 4% for each cultivar

0 187.5 375 750 1,125 1,500 Meters

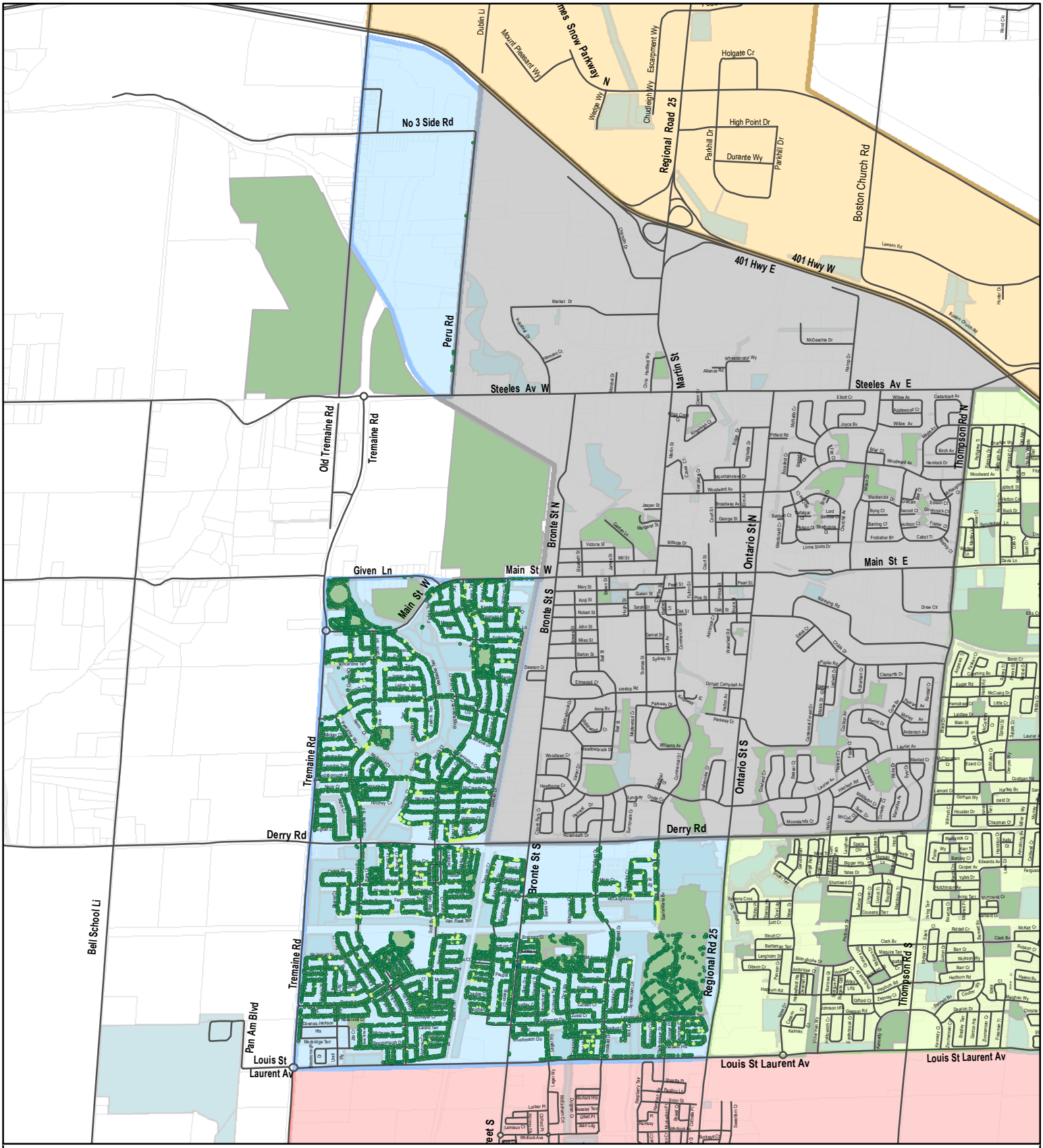
Appendix A

Map 7 - Bristol Survey - Residential



Appendix A

Map 8 - Sherwood Survey - Residential



Sherwood Survey - Residential
Parks
Town Lands

Trees (12217 trees)
Potential Plantings (366 trees)

Top 5 Species Cultivars and Percentages (rounded)

1) Sugar Maple - 6%
2) Red Oak - 6%
3) Hackberry - 6%
4) Maidenhair Tree - 6%
5) Honey Locust (Thornless) - 4%

The remaining 72% represents less than 5% for each cultivar

Meters
0 250 500 1,000 1,500 2,000