



City of
Peterborough

To: Members of the Committee of the Whole

From: W.H. Jackson, Director of Utility Services

Meeting Date: May 30, 2016

Subject: Report USDIR16-007
Urban Forest Strategic Plan Update

Purpose

A report to provide information on proposed updates to the Urban Forest Strategic Plan and to suggest that additional reports be prepared for Council's consideration.

Recommendations

That Council approve the recommendations outlined in Report USDIR16-007, dated May 30, 2016 of the Director of Utility Services as follows:

- a) That the amendments to the UFSP Implementation Schedule as detailed in Appendix A to Report USDIR16-007 be adopted;
- b) That a basic replanting policy of 3 trees for 1 as detailed in Appendix B to Report USDIR16-007 be adopted;
- c) That the tree species list as detailed in Appendix C to Report USDIR16-007 be adopted; and
- d) That staff be requested to report to Council on potential public and private tree protection and compensatory proposals that would secure the future sustainability of the Urban Forest.

Budget and Financial Implications

Implementation of Recommendation d) will have budget implications for those City Divisions (Public Works, Engineering & Construction, Parks and Recreation) that must remove trees to undertake their mandates. The costs of this policy will vary depending on the level of construction activity in any particular year however, as an example, to plant 3 trees for every 1 tree the Public Works Division removes each year would cost an estimated additional \$240,000. The full implementation of this program may take a number of budget years.

Background

Council at its meeting of June 27, 2011 in considering Report USPW11-008, “Urban Forest Strategic Plan for the City of Peterborough” approved the recommendations outlined in that report with the additional recommendation that

“All the recommendations contained within e) would be subject to Budget approval and all costs associated with the implementation be subject to a further council approval.”

The Urban Forest Strategic Plan (UFSP) is an action-oriented plan, with eight Strategic Objectives, supported by Recommendations, designed to underpin the vision statement.

Recommendation 3.7 of the UFSP requires that the UFSP be reviewed every 5 years to update the Strategic Plan to support the development of management priorities in order to respond to the condition and sustainability of the urban forest.

This report is the 5-year update and review of the 2011 UFSP. The report will firstly highlight what has occurred toward achieving the Objectives of the 2011 UFSP, then discuss critical issues that have to be considered in the next version of the UFSP, how the UFSP might be revised and the next steps.

1. Current Assessment of the UFSP

The 2011 UFSP consisted of 8 objectives and 49 distinct recommendations to move the vision statement forward. The following sections provide a broad overview of the status of the individual Objectives to date. Appendix A provides specific details on the progress made during the last 5 years on each Recommendation and proposed next steps as the UFSP moves forward.

1.1 Objective 1: “To maintain and enhance a sustainable urban forest in the City of Peterborough.”

Much work over the past five years has involved collecting tree inventory, improving canopy assessment through leaf-on aerial photography and promoting

the use of a more diverse range of tree species with the introduction of a recommended species list and trials of Carolinian tree species. Partnerships with Otonabee Region Conservation Authority (ORCA) and community volunteers have helped plant trees across the City.

1.2 Objective 2: “To maximize the benefits of the urban forest for the well-being of the community.”

Maximizing the benefits of the urban forest requires an assessment of existing canopy and analysis of tree inventory collected to determine the health of the urban forest and the opportunities for new planting. Staff has identified significant problems with the provision of adequate tree planting space and growth conditions in new subdivisions and is seeking to address this concern through revised engineering cross sections, improved soil volumes and new canopy compensation models.

1.3 Objective 3: “To formalize and enhance the City’s accountability as a steward, manager, regulator and promoter of the urban forest.”

Progress within this objective has been furthered by the provision of a new work order management system for forestry, ISA certifications for three staff and improved networking and professional collaborations. This objective has been further advanced since 2011 through a standardized inventory procedure and the clarification of staff roles and responsibilities within the City.

1.4 Objective 4: “To recognize and manage the urban forest as a key element of the City’s green infrastructure.”

A number of software tools are now used to assess urban forest benefits and to guide the development of compensatory tree planting models and improved engineering specifications.

1.5 Objective 5: “To preserve and protect the health of the urban forest and prevent unnecessary damage or removal.”

With the recognition of the environmental benefits of trees and value of the City’s urban forest, comes increasing concern over the protection of trees for wider community benefit. Council has recognized the importance of the urban forest through the adoption of the EAB management plan and staff has made considerable improvements in assessment and retention of trees where possible during sidewalk and road construction projects since 2011.

Public works staff have been trained in tree risk assessment enabling safe and proportionate assessment of private and public trees going forward.

1.6 Objective 6: “To identify and recognize significant valuable trees based on historic, aesthetic, cultural, social and ecological criteria.”

Heritage and significant tree recognition was advanced through Peterborough GreenUp and the initial development by City staff of a Draft Heritage Tree Policy. Seed collection is anticipated in the fall of 2016 from significant/heritage ash trees.

1.7 Objective 7: “To create a regulatory framework that includes ongoing monitoring and assessment.”

A segment recognizing the urban forest has been included in the current draft of the Official Plan. Pending review by staff and public consultation it is anticipated this revision will be finalized by year end 2016.

Canopy analysis shows that as much as 27% of the urban forest (or 1300 acres of trees) is unprotected by existing City by-laws. This is approximately double the percentage of canopy that will be lost through the EAB. It is proposed that staff review and bring forward tree protection and compensatory proposals necessary to secure the future sustainability of the Urban Forest in tandem with a public outreach on the value of the urban forest.

Improvements to inventory will provide greater accountability for tree losses through future compensatory models.

1.8 Objective 8: “To increase community awareness of the benefit of trees, encourage community involvement and create a shared responsibility for the stewardship of the urban forest.”

Progress has been made through increased public involvement and awareness of trees, driven forward by the EAB Management Plan public communications and outreach element. Much of the urban forest data collected by the City since 2011 is available publicly through the City web pages and improvements to public consultation on City projects affecting trees have been implemented.

Greater community involvement is anticipated in the future as existing partnerships with ORCA and TreeCanada are renewed and strengthened.

2. Critical Factors to Consider in the Immediate Future

Over the last 5 years various pressures on the urban forest have required a modification of focus for the UFSP. These changes are described in more detail in the following sections.

2.1 The Urban Forest and Human Health

The link between human health and the urban forest was recognized in the 2011 UFSP under Objective 4, Recommendation 4.2 – “Promote the contribution that the urban forest, as an element of green infrastructure, provides to the health and well-being of the community”. This recommendation has now assumed greater importance as recognition grows about the impact of urban heat islands and the lack of shade (i.e. tree canopy). By 2030 the costs to the provincial health service from skin cancer alone are projected to reach almost \$1 Billion. The impacts upon human physical health were not fully recognized in the 2011 UFSP.

In addition, scientific studies since 2011 support the link between cardiovascular benefits and the urban forest. Studies undertaken following the loss of ash trees from the EAB in the United States show a significant increase in Cardio-pulmonary deaths directly linked to the loss of tree canopy.

Clearly, maintenance of existing shade and provision of new shade now assumes a greater role than thought in 2011.

2.2 Emerald Ash Borer

Although recognized as a significant threat in the 2011 UFSP, the Emerald Ash Borer (EAB) was not officially confirmed in the City until 2014. Preparations for this invasive insect, which has the potential to kill all of the ash trees in the City (14% of the urban forest canopy), were implemented through the EAB Management Plan starting in 2013. Early preparation for EAB will reap future rewards by spreading the resources needed to deal with the problem over a longer period of time. However, as the insect becomes established and progresses through an exponential growth phase, ash trees will be killed at an equivalent rate. The focus of urban forest management and many resources over the next 5 years will be heavily weighted toward dealing with the damage that the EAB causes.

An offshoot of the preparations for the EAB has been the advancement of many other aspects of urban forest management such as inventory, geo-location of trees, work programming, public outreach and communications, health monitoring practices and wood utilization. All of these will have long term positive impacts on the management and sustainability of the urban forest.

2.3 New Subdivision Design

Current provincial planning standards and the “new urbanism” call for greater densities in new subdivision development. Reduced road allowances, reduced building setbacks, active transportation policies and changing infrastructure standards and regulations, are creating the perfect storm for trees. Space for large stature, native trees is no longer available within current engineering cross sections for new subdivision development. The concern is that the whole

character of the City may change as a result and that the essential environmental benefits of medium to large trees will be lost forever. Clearly the focus has to recognize this shift in design and acknowledge the need for trees by including clearly identified tree corridors, i.e. viable space that is specifically reserved for trees within new subdivision design.

New cross section designs are required that make room for trees by grouping some utilities, placing some utilities in locations that have not normally been used and by utilizing new techniques to provide adequate root growth zones for trees.

2.4 Growth in City Infrastructure

The City continues to upgrade its infrastructure at a significant rate. When main arterial roads are reconstructed they are designed to be all inclusive of the various on and off-road users typically resulting in less room for trees and tree roots. For these major reconstruction projects, it can be difficult to retain existing trees and the focus has moved toward accurate pre-design assessment and adequate compensation for lost trees.

2.5 Urban Forest Composition

Since 2011 an on-going inventory of most of the City's right-of-way and some parks has shown the urban forest to be comprised of very few tree species and an urban forest that is generally mature and in a declining condition. Much management in the next 5 years needs to focus on gathering more data, diversifying tree species, planting many more trees and retaining mature trees for longer periods through improved management practices.

2.6 Canopy Cover

Based on 2011 leaf-on aerial photography, the baseline data for canopy cover in the City was approximately 29%. Although the 2015 leaf-on imagery has not yet been evaluated, it is believed that the tree canopy lost through major city works and private developments since 2011 have resulted in a net loss of tree canopy.

3. Revisions to the UFSP

Significant revisions to the UFSP are proposed over the next 5 year period. These revisions are guided by information collected since 2011, data that continues to be collected and the need to address key problems of human health impacts, sustainability and climate change. The sections below discuss in detail the proposed changes.

3.1 Revised Implementation Schedule

Revisions to the implementation schedule identified in the 2011 UFSP are shown in Table 1 (Appendix A).

Planned revisions address the critical factors identified in Section 2. The revisions reallocate resources toward addressing threats to the urban forest, human health, sustainability and climate change.

Those objectives that relate to maintaining and increasing canopy, such as identifying planting sites, increasing space for additional planting and adopting a compensatory model have been brought forward, while those activities that relate more to studies and long-term management of the urban forest have been pushed further into the future. Examples of recommendations that do not immediately address the revised focus of the urban forest would be detailed studies, plot sampling and further analysis.

By doing this staff will be utilizing their time to better deal with the activities that have now become the priorities.

3.2 Proposed Replanting Policy

A detailed City tree planting policy has never been formally received or endorsed by Council. A tree planting policy is mentioned in By-law 90-231 together with a tree planting levy, but only to the extent that one tree should be planted for every 50ft of linear lot frontage in new subdivisions.

An updated replanting policy is required to protect and grow the tree canopy. It is important that both private and public trees be considered in any replanting policy given the losses that have occurred, or will occur, from EAB, construction and new subdivision/site plan development. For example, it takes one replacement tree over 55 years to replace the yearly environment benefits of the loss of a mid-age ash tree.

A replanting policy needs to address the loss of trees, in a reasonable and proportionate manner and must sustain the urban forest in the light of losses not only from “man-made” factors, but also from biotic, or natural factors, such as invasive species, wind storms, ice storms and old age.

Recognizing that environmental benefits are one of the primary reasons that we value the urban forest, modeling tree loss and urban forest renewal from an environmental value focus suggests that a 3 for 1 policy for replacement of individual trees (woodlot and hedgerows are treated differently) is both reasonable and affordable, (see Appendix B for a summary).

The EAB Management Plan update of 2013 (USDIR13-012 Section 3.3) speaks to a 3 for 1 replacement policy based upon the early work undertaken in this area and, accordingly, it is prudent now to move forward and report to Council in the near future on such a tree replacement policy. It is important to note that this policy will impact both municipal and private works and that there will be a cost involved. It is equally important to understand that the cost is relatively minor over

the life of a tree and that the benefits gained by all the residents of the City outstrip the costs.

It is proposed that this replanting policy will be Corporate wide as well as include all tree removals whether municipal or private.

A detailed Replanting Policy will be brought back for Council’s consideration that incorporates the basic 3 for 1 policy but makes appropriate allowances for specific field conditions, such as woodlots, hedgerows and removal of dead trees etc. Payment in lieu procedures will also be considered for those instances where sufficient replanting space is not available.

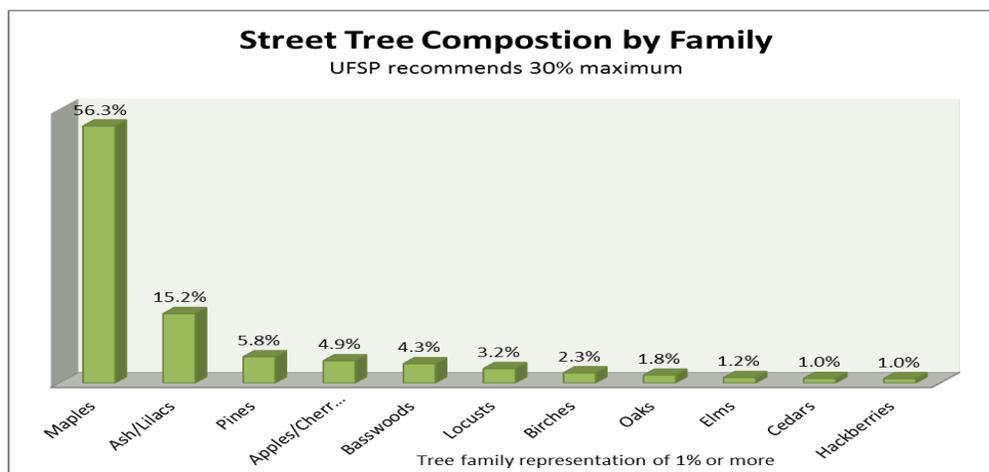
3.3 Species Recommendations and Biodiversity

Based on the 2011 inventory, it is now apparent that the urban forest is heavily biased towards a limited number of species. In particular, maple species represent 56% of the current inventory (see Figure 3.1). As noted in the 2011 UFSP high percentages of any one species (monocultures) exposes the urban forest to significant damage should any species-specific pest or condition emerge in the future. Already the Asian Long-horned Beetle, whose preferred host is maple, has twice been found and eradicated in the Toronto area.

In an effort to work toward a more diverse forest canopy, staff have developed a species list for replanting purposes (see Appendix C). This list is regularly reviewed by staff. However, the range of tree species that will tolerate our climatic and urban conditions is significantly limiting, so the focus of species planning is directed toward species evenness rather than species richness over the next 5 year period.

More inventory is required to include Parks and Open Spaces to gain greater insight into our current urban forest composition.

Figure 3.1: Street Tree Composition by Family



Of the Maple family, 29.3% are Norway Maples and 16.9% are Sugar Maples. The UFSP recommends that no species be more than 10% to limit the damage from any future adverse species-specific pest or disease.

3.4 Tree Protection By-Laws

Currently there are two by-laws that relate to the protection of public and private trees in the urban forest. By-law 82-82, prohibits the injury or destroying of trees on highways. This by-law relates to City owned trees in the road allowance, a limited area of the urban forest and one that is controlled by the City.

By-law 97-68 prohibits and regulates the injury, destruction or removal of trees in “defined” areas of the City. This by-law regulates tree removal within a parcel of land having an area in excess of 5 acres under common ownership. With our geo-located tree canopy we are now able to identify the reach of this By-law. Forty-three percent of the urban forest exists in private properties (243 properties) greater than 5 acres, so the destruction or removal of trees is controlled by this By-law within these areas although it is doubtful if many of the owners of these properties are aware of this.

Over 27 % (1300 acres) of the urban forest canopy exists in private properties 5 acres or less (just over 25,000 properties), and is currently unprotected by any By-law.

A growing number of instances of healthy tree removals have attracted public attention since the adoption of the 2011 UFSP and it is now prudent to regulate more stringently the removal of all healthy trees if the objectives of the UFSP are to be achieved.

Summary

The Urban Forest Strategic Plan has been in existence for five years. A review of the Plan Objectives indicate that they are still relevant today but that the activities of this Plan need to be refocused toward addressing threats to the urban forest, human health, sustainability and climate change.

Changes have been proposed in the timelines of certain activities within the Plan together with tree replanting and tree species policies. A further report is proposed that will provide protection for both public and private trees in the City.

Submitted by,

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Attachments:

Appendix A: Revised Implementation Schedule for the Urban Forest Strategic Plan

Appendix B: Replanting Policy of 3 Trees for 1

Appendix C: City of Peterborough Replanting Species List

Objective 1: To maintain and enhance a sustainable urban Forest in the City of Peterborough.

UFSP No.	Recommendation	Current Status as of May 2016	Next Steps	Revised Implementation*		
				1	2	3
1.1	Develop and implement management plan targets for trees in Natural Areas, Parks, on the Right of Way and on Residential, Industrial, Commercial and Institutional lands.	The City is divided into 30 Forest Management Zones (FMZ). The Street Tree inventory has been completed in 21 FMZ. Identification of infill planting sites has been completed in 8 FMZ.	Complete the Street Tree inventory and the identification of infill planting opportunities in the outstanding FMZs.		✓	
1.2	Conduct plot samples, applying a recognized classification system to complete periodic inventories of the urban forest within prescribed timelines and integrate data with the City GIS system	Geomatics secured leaf-on aerial photography in 2011. High resolution, leaf-on aerial photography flown in 2015. As part of the EAB program, spectral imaging to identify Ash species completed in 2015 from leaf-on City wide aerial photography. Lidar completed 2015. Project specific plot sampling completed for Byersville Detention Area, Kawartha Heights Detention Area, City Snow Dump perimeter and Trent Ball Field project areas.	New technology achievements of Lidar, high resolution leaf-on aerial photography and spectral imaging for tree species identification supersedes the need for City wide plot sampling. Future action will be directed to plot sampling to characterize specific construction and development project areas that impact the urban forest and site specific species inventory (e.g. Parks and Natural Areas)		(✓)	✓

* (✓) = 2011-2016 Original Implementation Schedule approved by Council (Report USPW11-008)

✓ = 2016-2021 Revised Implementation Schedule

Objective 1: To maintain and enhance a sustainable urban Forest in the City of Peterborough.

UFSP No.	Recommendation	Current Status as of May 2016	Next Steps	Revised Implementation*		
				1	2	3
1.3	Set percentage limits for cultivars, species and genera to encourage biodiversity in public tree planting programs.	Guideline advanced in the UFSP No more than: 10% of the same Species 20% of the same Genus 30% of the same Family Recommended list for Street, Park and Site Plan Trees ordered by Family, Genus and Species completed (Specification CP 801.02).	Continue to implement Guideline for tree planting projects.	Implementation complete and ongoing		
1.4	Establish targets for native species composition in various land use classes.	Recommended native species for street trees are identified in Specification CP 801.02. No targets advanced for native species percentage for street tree inventory. Site conditions may restrict native tree species suitability due to urban conditions (e.g. salt tolerance) and site constraints (e.g. planting space).	Continue where sites are suitable to plant native species for City tree planting projects. Conduct plot sample inventories in select City woodlots to record native species representation (e.g. Mapleridge, Nichols Oval, and Sherbrooke Woods).	(✓)	✓	

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✓ = 2016-2021 Revised Implementation Schedule

Objective 1: To maintain and enhance a sustainable urban Forest in the City of Peterborough.

UFSP No.	Recommendation	Current Status as of May 2016	Next Steps	Revised Implementation*		
				1	2	3
1.5	Encourage the production of high quality native trees grown from local genetic seed sources by regional nurseries.	Potential seed bank (storage facility) under review for selected EAB affected native Ash.	Following selection of a contract grower, the project will be expanded to also include other species. For 2016/2017 seed collection and propagation is recommended for preservation of significant Bur Oak.	✓		(✓)
1.6	Create and maintain a list of recommended native and exotic tree species. Make this list available to City staff, local garden centres, community groups and individual property owners	Recommended List for Street, Park and Site Plan Trees ordered by Family, Genus and Species (Specification CP 801.02) approved by the Director (March 2012). CP 801.02 posted on the City of Peterborough Urban Forest web site.	Review CP 801.02 on an annual basis for new introductions successfully tested and potential deletions. Include reference to CP 801.02 in City of Peterborough Engineering and Design Standards.	Implementation complete and ongoing		
1.7	Implement trials with Carolinian tree species in public parks to enhance the percentage of climate adaptable species in future plantings	In 2013/2014 the following Carolinian species were introduced on a trial basis: Liriodendron tulipifera (Tulip tree), Platanus occidentalis (Sycamore) and Nyssa sylvatica (Black Gum)	Trial performance assessment will continue.	Implementation complete and ongoing		
1.8	Develop response plans for severe weather events such as high winds, ice storms and drought to minimize impact. On the long term health of the urban forest.	All PW urban forest arborists completed Tree Risk Assessment training in 2015.	Assessment protocols are incorporated in the new City Works urban forest data base.	Implementation complete and ongoing		

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Objective 1: To maintain and enhance a sustainable urban Forest in the City of Peterborough.

UFSP No.	Recommendation	Current Status as of May 2016	Next Steps	Revised Implementation*		
				1	2	3
1.9	Create and maintain corridors of mature trees as connecting links between Natural Areas in the City.	Woodlot and Hedgerow protection advanced through Planning initiatives through the Subdivision Development protocols.	Ongoing	✓		(✓)
1.10	Restore and enhance canopy cover to improve the ecological benefits in Open Space.	In 2015, Open Space and Parkland tree planting in partnership with ORCA and community volunteers included: Medical Drive SWMP, Bears Creek Gardens and Franklin/Hilliard flood plain, Glover and Barnardo Park, Water Street parkland along Otonabee River south of Parkhill Road. In 2016, Kiwanis Park and Sir Sandford Fleming Drive	Additional planting locations for 2016 and beyond are under review.	✓		(✓)

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✓ = 2016-2021 Revised Implementation Schedule

Objective 2: To maximize the benefits of the urban forest for the well-being of the community.

UFSP No.	Recommendation	Current Status as of May 2016	Next Steps	Revised Implementation*		
				1	2	3
2.1	Establish a baseline for canopy cover and periodically update canopy cover (e.g. with each upgrade of the City orthographic record.	'Leaf-on' aerial photography completed in 2011. Canopy analysis completed by Geomatics. 2011 canopy cover estimate: 29%.	'Leaf-on' aerial photography at increased resolution obtained through RFP in 2015. Canopy to be re-analyzed in 2016. Investigate an i-Tree Eco analysis for the City. Examine potential for canopy cover increase to 34%	✓	(✓)	
2.2	Increase the area available for tree planting in Site and Subdivision developments.	Continue to consult with Engineering and Planning on urban forest management plans and requirements. Review plans for new subdivisions, site development and construction projects and make recommendation to achieve the objectives of the approved Urban Forest Strategic Plan.	Reduction of residential building set back as part of 'new urbanism' design has limited the space to plant large stature trees such as sugar maple and red oak. This impact will significantly change the landscape character of the City. Staff are currently reviewing options to reconfigure utility location in the Right of Way in order to increase the opportunity to plant a wider range of trees including traditional, large stature native species.	✓	(✓)	
2.3	Identify suitable planting locations to sustain large trees and provide the environmental conditions to enable each species to reach maturity.	See 2.2	See 2.2	✓	(✓)	

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✓ = 2016-2021 Revised Implementation Schedule

Objective 2: To maximize the benefits of the urban forest for the well-being of the community.

UFSP No.	Recommendation	Current Status as of May 2016	Next Steps	Revised Implementation*		
				1	2	3
2.4	Seek opportunities for planting and protecting groves of recommended species on public and private land to help mitigate the impact of climate change	Tree inventory, preservation, protection and replacement requirements are under review for new subdivision development. Current practice falls short in maintaining a record of net canopy changes. In addition to subdivision planning, other site development and construction projects fall short in addressing potential net canopy preservation and tree inventory enhancement.	Staff are currently reviewing policy options to replace canopy losses resulting from construction and development including Street Tree replanting ratios and Woodlot/Hedgerow replacement. See also 7.4	✓	(✓)	

* (✓) = 2011-2016 Original Implementation Schedule approved by Council (Report USPW11-008)

✓ = 2016-2021 Revised Implementation Schedule

Objective 3: To formalize and enhance the City's accountability as a steward, manager, regulator and promoter of the urban forest.

UFSP No.	Recommendation	Current Status as of May 2016	Next Steps	Revised Implementation*		
				1	2	3
3.1	Provide sufficient qualified personnel, equipment and other supporting resources for planned urban forest management programs. Recommend budget requirements for personnel, equipment, software and inventory to fulfil the objectives of the UFSP.	The approval of a Management Plan for EAB (Report USDIR 13-004) provided a contract position of 1 staff member, development of new management software and progress in completing a Street Tree inventory. These resources are required to manage the EAB program but have significant spin-offs for the overall management of the urban forest.	Continue to review staff and resource deployment. Consider organizational structure adjustments in 2016 to maximize service delivery.	✓		(✓)
3.2	Develop and update training programs and provide professional membership for arborist personnel.	In 2015, three staff members successfully completed their certification as recognized professional arborists registered under the International Society of Arboriculture (ISA)	Continue to provide professional training and network opportunities for staff	✓	(✓)	
3.3	Investigate providing line clearing services for other utilities and develop strategic alliances for urban forest management.	Review of Line Clearing Specifications in current PUS contracts. Evaluate contract performance	Continue to observe contract performance. Await outcome of Hydro One proposal to buy the utility (2016/2017)		(✓)	✓
3.4	Participate in professional associations and extend professional relationships with other municipalities to share urban forest best management practices.	Priority directed to networking for EAB. In 2015, the City partnered with TreeCanada to financially assist land owners to treat private ash trees for EAB control.	Ongoing participation in Regional EAB Technical Working Group. Maintain and enhance local and regional relationships.	Implementation complete and ongoing		

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Objective 3: To formalize and enhance the City's accountability as a steward, manager, regulator and promoter of the urban forest.

UFSP No.	Recommendation	Current Status as of May 2016	Next Steps	Revised Implementation*		
				1	2	3
3.5	Develop and maintain a common information system on woodlots, street trees, heritage trees and invasive species. For new developments, require consultants to provide information in a compatible format	Standardized procedure for tree inventory data for new subdivisions is currently under review. Street tree and woodlot assessments follow ISA Best Management Practices.	Refine the standard format to enable calculation of tree benefits and canopy data.	✓	(✓)	
3.6	Track, monitor, evaluate and communicate the progress of the UFSP using recognized criteria to evaluate and monitor progress	Implementation Plan approved by Council Report USPW11-008, June 27, 2011. Revised priority recommendations are advanced in the 2016 update review.	Ongoing review of implementation status and priority classification.	✓	(✓)	
3.7	Adopt a 5 year time frame to update the UFSP to support the development of management priorities in order to respond to the condition and sustainability of the urban forest	Initial implementation time lines for completion of recommendations have been revised to respond to new priorities. The most significant challenge influencing the projected 2011 time lines relate to the EAB program and its impact on staff resource availability	Submit to Council updated recommendations for the UFSP.	✓	(✓)	
3.8	Establish departmental, individual and associated roles and responsibilities for management of the urban forest	Management responsibilities will be clarified as an outcome of Policy/Specification development. Initial review of UFSP implementation commenced with Engineering, Planning and Public Works.	Continue to review staff and resource deployment. Consider organizational structure adjustments in 2016 to maximize service delivery.	(✓)	✓	

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✓ = 2016-2021 Revised Implementation Schedule

Objective 4: To recognize and manage the urban forest as a key element of the City's green infrastructure.

UFSP No.	Recommendation	Current Status as of May 2016	Next Steps	Revised Implementation*		
				1	2	3
4.1	Recognize the urban forest as a key element of the City's green infrastructure	Contribution of the urban forest highlighted at Green Infrastructure Workshop March 2011	See 4.4		✓	
4.2	Promote the contribution that the urban forest, as an element of green infrastructure, provides to the health and well-being of the community.	Opportunity was provided at a Sustainable Peterborough Workshop and the inaugural Peterborough Shade Forum to present the benefits provided by the urban forest.	See 4.4		✓	
4.3	Invest in a corporate compatible asset management program for trees that combines tree inventory, GIS spatial information and work order tracking capability	City Works Software configured for the urban forest management program	In 2016, initiate in the field data entry by work crews to keep data base up to date		✓	
4.4	Monitor and assess the performance and benefits of the urban forest through the use of models such as the Urban Forest Effects Model (UFORE)	i-Tree Eco application replaced UFORE (2011). Application of i-Tree benefit calculations used for tree compensatory model in future USD Capital projects. i-Tree benefit calculations integral to EAB Management Plan.	In 2016-2017 apply i-Tree valuation to tree replacement policy for municipal projects. Following this make recommendation City wide application. Investigate i-Tree Eco assessment of the urban forest..	✓	(✓)	

* (✓) = 2011-2016 Original Implementation Schedule approved by Council (Report USPW11-008)

✓ = 2016-2021 Revised Implementation Schedule

Objective 4: To recognize and manage the urban forest as a key element of the City's green infrastructure.

UFSP No.	Recommendation	Current Status as of February 2016	Next Steps	Revised Implementation*		
				1	2	3
4.5	Require that all Development Agreements include an approved green infrastructure plan whereby a developer, as part of the development improvements, is required to plant trees of approved species along the ROW and provide landscape and environmental improvements to Open Space lands within the development area.	Specification CP 801.02 and Specification CP 801.01 have been included in Subdivision Agreements. New urbanism (e.g. Mason subdivision) has demonstrated the need to rethink the standard ROW cross section in order to achieve suitable planting space for trees fronting development with restricted set back..	In 2016 adopt revised ROW standard utility configuration.	✓		
4.6	Undertake a study to identify canopy cover targets for land use classes as described in the Official Plan and identify locations to increase tree planting in order to meet these targets.	Commenced infill planting following sidewalk reconstruction (Fall 2011). 8 FMZ have been evaluated for infill Street tree planting Canopy cover by land use class completed for 2011 data	Complete the analysis of infill planting opportunities in remaining Forest Management Zones. Complete canopy cover by land use class using 2015 data.		✓	

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✓ = 2016-2021 Revised Implementation Schedule

Objective 5: To preserve and protect the health of the urban forest and prevent unnecessary damage or removal.

UFSP No.	Recommendation	Current Status as of February 2016	Next Steps	Revised Implementation*		
				1	2	3
5.1	Investigate a permitting process for the removal of healthy trees.	No Activity	See 7.3	✓		
5.2	Introduce regular inspection cycles and utilize inventory data of City owned trees to establish cyclic maintenance programs and a system of Work Order response priority.	Ash tree inspections on a biennial cycle. Inventory of all forestry management zones (FMZ) remains to be completed.	Review and recommend priority task activity for PW Urban Forest Management operations utilizing new Tree Risk Assessment procedure within City Works	✓		(✓)
5.3	Inform the community of the potential for damage from invasive species and the preventative actions that may be taken. Respond to threats from invasive species in cooperation with stakeholders.	City Council adopted an EAB Management Plan (Reports USDIR13-004, USDIR13-012 and USDIR15-002). Public relations, Ash tree inventory, ongoing monitoring and wood management, commenced 2013. Tree injection program commenced June 2014. Funding for private Ash tree injection provided through partnership with Tree Canada.	Review program status and service delivery options including trap installation and monitoring, tree injection, Ash tree removal and tree replacement planting. Develop an Invasive Species Management Strategy	Implementation complete and ongoing		
5.4	Establish a committee of City departments and utility representatives to develop and recommend corporate policy and procedures to ensure the protection of trees during installation and/or maintenance of grey infrastructure.	Tree protection presentation delivered to Engineering and Public Works.	Ongoing		✓	

* (✓) = 2011-2016 Original Implementation Schedule approved by Council (Report USPW11-008)

✓ = 2016-2021 Revised Implementation Schedule

Objective 5: To preserve and protect the health of the urban forest and prevent unnecessary damage or removal.

UFSP No.	Recommendation	Current Status as of February 2016	Next Steps	Revised Implementation*		
				1	2	3
5.5	Produce a guidance document for planners, developers and architects on trees and development that includes minimum protection distances and methods of tree protection during the development process.	Reference OPSS 801 Presentation delivered to Engineering and Public Works. Action Plans prepared for Engineering rehabilitation and sidewalk projects. Tree protection guidelines included in tree preservation planning for new subdivision development (e.g. Lily Lake)	Develop City of Peterborough Tree Protection Specification CP 801.03 for tree preservation for all new development areas.	✓		
5.6	Adopt a method of risk assessment that safeguards the public while preserving the benefits of the urban forest.	This needs to be completed before adopting a protection/preservation By-law (see 7.3) In 2015, PW Arborists completed training in Tree Risk Assessment procedures	Tree Risk Assessment to be incorporated into new City Works management software and incorporated into Property Standards private tree evaluations.		✓	
5.7	Re-establish an environmental or sustainability committee to oversee the management and protection of designated Natural Areas in the City with a proactive and planning review mandate	No activity	Consult with Sustainable Peterborough Committee	(✓)	✓	

* (✓) = 2011-2016 Original Implementation Schedule approved by Council (Report USPW11-008)

✓ = 2016-2021 Revised Implementation Schedule

Objective 6: To identify and recognize significant valuable trees based on historic, aesthetic, cultural, social and ecological criteria.

UFSP No.	Recommendation	Current Status as of February 2016	Next Steps	Revised Implementation*		
				1	2	3
6.1	Implement a heritage tree identification, designation and protection program following recognized standards (e.g. Ontario Heritage Tree Alliance)	A three year work plan to identify and designate heritage and significant trees advanced by GreenUp in consultation with USD and Heritage and Culture completed third quarter 2011. Funding from PACAC and Ontario Trillium Foundation approved. Project completed with publication in 2013 of "Beneath the Canopy". Trees within proposed Avenues Heritage Control District identified as integral to the district character.	Review the potential for heritage and significant tree designation for select trees from Beneath the Canopy, Neighbourhoods surveys and City inventory. Continue participation in the preparation of a heritage landscape plan for the proposed Avenues Heritage Control District.		✓	
6.2	Investigate economic incentives for land owners with designated heritage trees on their property	No activity	This is one possible outcome of Item 6.1. To be administered by Heritage and Culture Division		✓	
6.3	Implement a seed collection and propagation program in cooperation with regional nurseries to preserve the genetic heritage of significant trees in the City	See 1.5	See 1.5		✓	

* (✓) = 2011-2016 Original Implementation Schedule approved by Council (Report USPW11-008)

✓ = 2016-2021 Revised Implementation Schedule

Objective 7: To create regulatory framework that includes ongoing monitoring and assessment.

UFSP No.	Recommendation	Current Status as of February 2016	Next Steps	Revised Implementation*		
				1	2	3
7.1	Amend the Official Plan (Section 3) to include a segment directly related to the urban forest. Include the term urban forest in the appropriate context in the Official Plan	Draft inclusion in the forthcoming Official Plan revision being reviewed by staff.	Public comment on inclusion of specific item on the urban forest scheduled for summer of 2016. Inclusion anticipated late 2016	✓		
7.2	Investigate developing a By-law to maintain the urban forest with no net loss of canopy cover	A replanting policy of 3 trees for 1 is recommended in this report.	Refine compensatory replanting policy to acknowledge the various circumstances encountered in the field.	✓	(✓)	
7.3	Review existing tree By-laws and make recommendation to protect and preserve trees on private and public lands, including the adoption of an appropriate compensatory model for tree removal	There are presently six by-laws, 1982-82,1990-231,1990-329,1991-116,1992-158,1997-68, that deal with various aspects of trees. Only by-laws 1982-82 and 1997-68 talk to the preservation of trees on private and public lands. Canopy analysis shows that 27% of the urban forest is unprotected by existing by-laws, i.e. tree cover on private property of 5 acres or less. Development of a trial compensatory model completed 2015. Roll-out of the model anticipated in 2016	Revise existing tree by-laws (see 7.2)	✓	(✓)	

* (✓) = 2011-2016 Original Implementation Schedule approved by Council (Report USPW11-008)

✓ = 2016-2021 Revised Implementation Schedule

Objective 7: To create regulatory framework that includes ongoing monitoring and assessment.

UFSP No.	Recommendation	Current Status as of February 2016	Next Steps	Revised Implementation*		
				1	2	3
7.4	Implement a mechanism for replacing losses to the urban forest either on a development site or at an off-site location as directed by the City by providing a monetary contribution to a tree reserve fund. The reserve fund will be designated for planting trees on municipally managed or other protected lands to replace leaf area lost through development and construction.	Number 7.3 needs to be completed first. See also 4.4.	Ongoing See 7.2 and 7.3		✓	
7.5	Create an incentive and recognition program for developers who through creative planning develop sites that preserve and protect existing significant trees, woodlots and hedgerows	No activity	Review and implement procedures to formalize the appropriate review of smaller projects. See also 7.3		✓	
7.6	Require that prior to approval, all applications for Committee of Adjustment, Site Plans and Subdivision Agreements provide an arborist report on the health and condition of trees on the site and a statement of impact.	Council raised concern in 2011 regarding financial impact for small projects. Recommended that Planning Landscape Architect administer this recommendation for Committee of Adjustment and Site Plans on a case by case basis. Arborist reports provided for new subdivisions as agreed	Ongoing Also see 7.3 Review and implement procedures to formalize the appropriate review of smaller projects.	Implementation complete and ongoing		

* (✓) = 2011-2016 Original Implementation Schedule approved by Council (Report USPW11-008)

✓ = 2016-2021 Revised Implementation Schedule

Objective 7: To create regulatory framework that includes ongoing monitoring and assessment.

UFSP No.	Recommendation	Current Status as of February 2016	Next Steps	Revised Implementation*		
				1	2	3
7.7	Implement and enforce development standards for the preservation, protection and enhancement of the urban forest during site development and construction projects.	Number 5.5 needs to be completed first			✓	
7.8	Provide professional support to implement and administer the UFSP	Conversion of Urban Forest contract to full-time position.	Review of succession planning in Public Works Forestry section to facilitate the recommendations of the Strategic Plan. Review of USD staff resources allocated to administration of the UFSP.	✓	(✓)	

* (✓) = 2011-2016 Original Implementation Schedule approved by Council (Report USPW11-008)

✓ = 2016-2021 Revised Implementation Schedule

Objective 8: To increase community awareness of the benefit of trees, encourage community involvement and create a shared responsibility for the stewardship of the urban forest.

UFSP No.	Recommendation	Current Status as of January 2016	Next Steps	Revised Implementation*		
				1	2	3
8.1	Develop and maintain alliances with stake holders to engage the community and maximize opportunities for the protection and enhancement of the urban forest.	Presentations made to the community on the benefits of trees. Informative 'Door-Hanger' provided to residents receiving a new Street Tree; effective spring 2012. Communication and Public Outreach campaign (ongoing) for EAB since 2013 has also been used to promote the Urban Forest	Continue to improve communication practices to engage the community with the urban forest.	✓	(✓)	
8.2	Provide public access to information through a City urban forest web page	"Peterborough Trees" web pages developed 2014. EAB public map available since 2014	Improve and enhance urban forest web pages. Publish tree inventory on public map	✓	(✓)	
8.3	Work with community stake holders to provide a variety of incentives and support services to encourage stewardship of the urban forest.	Planting partnership with ORCA to encourage urban forest stewardship. Partnership with TreeCanada developing and implementing a private ash tree treatment subsidy in 2015.	Investigate incentives for planting and other urban forest support initiatives to the community		✓	

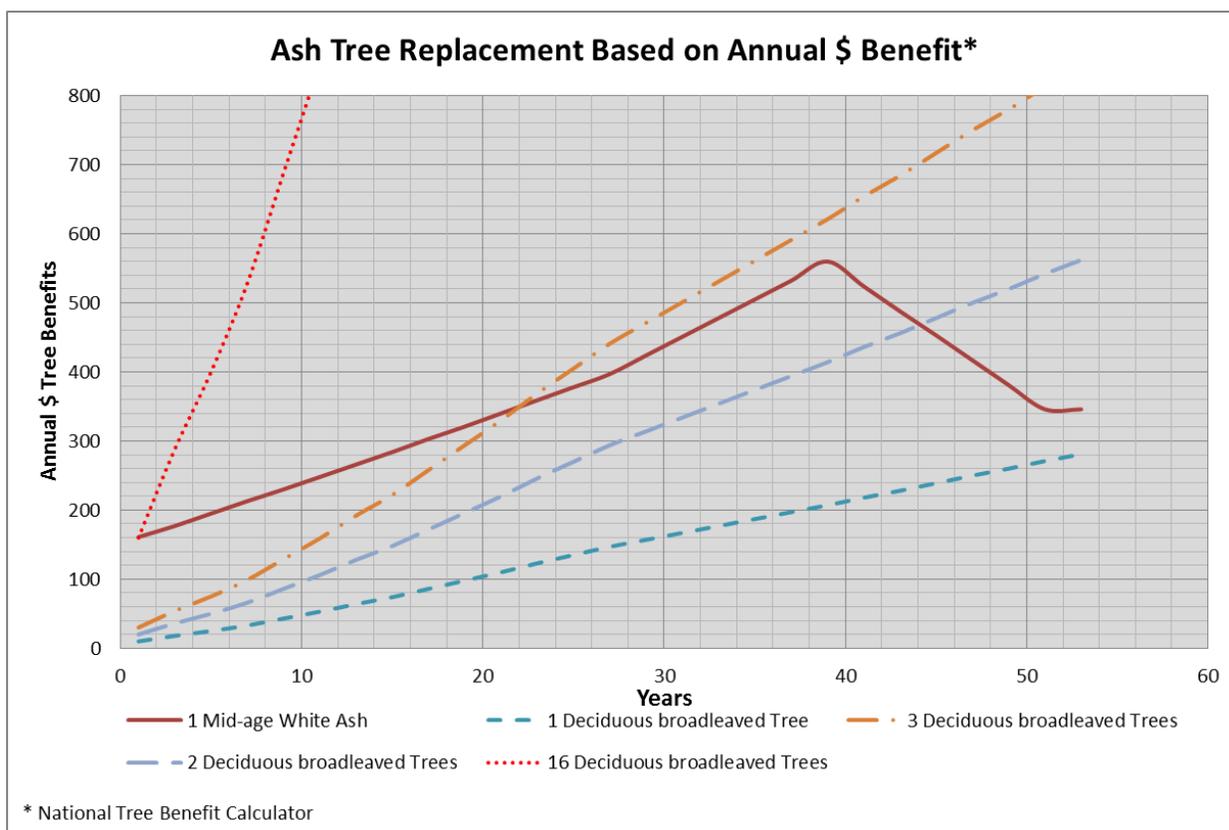
* (✓) = 2011-2016 Original Implementation Schedule approved by Council (Report USPW11-008)

✓ = 2016-2021 Revised Implementation Schedule

Appendix B – Canopy Compensation Models

Canopy compensation models based upon quantifiable environmental benefits show that equivalency of benefits can be achieved in a decreasing number of years as the number of replacement trees increases.

In the chart below, the dollar benefit for environmental services provided by an average mid-age ash tree of 35cm trunk diameter (calculated using the i-Tree National Tree Benefit Calculator) are compared with a variety of tree replacement options.



The removed tree (dark red solid line) in the charted example is about 30 years old and was providing about \$170 per year in quantifiable environmental benefit.

If this tree is replaced with one new tree (dark blue short dash line), equivalency of benefit is not reached for over 50 years.

Replacing with 2 trees (light blue long dash line) reaches equivalency at about 45 years.

Replacing with 3 trees (brown dot dash line) reaches equivalency of benefits in about 25 years.

The chart shows that immediate equivalency is obtained by replacing the lost tree with 16 new trees (red dotted line). This is considered a somewhat impractical and unaffordable option.

The balance between costs and benefit replacement is estimated to be a 3 for 1 replacement. In this scenario, the benefits of the lost tree are replaced within 25 years with an additional 20-25 years of increased benefits provided by the replacement trees.

Based on the average tree removals now undertaken by the Public Works Division, a 3 for 1 replacement program would add approximately \$240,000 to the annual replacement costs within Public Works alone. Although this is a substantial cost, it can be implemented in phases as funding is available and with a set tree replacement program in place, funding from other sources that require matching funds may be easier to obtain because the City will have budgeted for our own replacements.

Appendix C Specification CP 801.02 Recommended Species List for Street, Park and Site Plan Trees**Aceraceae (Maple Family)**

Genus / Species	Common Name	Notes	Zone	Height (m)	Spread (m)	Size	Salt Tolerance
<i>Acer campestre</i> (ST), (P), (SP)	Hedge maple		5	10	9	M	high
<i>Acer ginnala</i> 'Flame' (P), (SP)	Amur maple		2	6	5	S	medium
<i>Acer platanoides</i> 'Emerald Queen' (ST), (P), (SP)	Emerald Queen maple	not near natural area	4	12	10	M	high
<i>Acer platanoides</i> 'Columnare' (ST), (P), (SP)	Columnar maple	not near natural area	4	12	5	M	high
<i>Acer platanoides</i> 'Crimson King' (ST), (P), (SP)	Crimson King maple	not near natural area	4	12	10	M	high
<i>Acer platanoides</i> 'Deborah' (ST), (P), (SP)	Deborah maple	not near natural area	4	14	12	M	high
<i>Acer rubrum</i> 'Frank Jr' (ST), (P), (SP)	Red Point maple	spring dig only	4	15	10	M	low
<i>Acer saccharinum</i> 'Silver Queen' (ST), (P), (SP)	Silver Queen maple	spring dig only	4	16	12	L	medium
<i>Acer saccharum</i> 'Green Mountain' (ST), (P), (SP)	Green Mountain sugar maple		4	20	15	L	low
<i>Acer saccharum</i> 'Endowment' (ST), (P), (SP)	Endowment sugar maple		4	15	6	M	low
<i>Acer saccharum</i> 'Barrett Cole' (ST), (P), (SP)	Apollo sugar maple		4	8	3	S	low
<i>Acer tataricum</i> (ST), (P), (SP)	Tatarian maple		3	8	7	S	medium
<i>Acer x freemanii</i> 'Autumn Blaze' (ST), (P), (SP)	Autumn Blaze maple	spring dig only	3	16	12	L	medium

Native (N), Street Tree (ST), Park tree (P) and Site Plan tree (SP)

Size: Small (S) = up to 8m / Medium (M) = 9 to 15m / Large (L) = greater than 15m

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Appendix C Specification CP 801.02 Recommended Species List for Street, Park and Site Plan Trees**Betulaceae (Birch Family)**

Genus / Species	Common Name	Notes	Zone	Height (m)	Spread (m)	Size	Salt Tolerance
<i>Betula papyrifera</i> (N), (P), (SP)	Paper birch	spring dig only	1	17	5	M	high
<i>Carpinus betulus</i> 'Fastigiata' (ST), (P), (SP)	European hornbeam	spring dig only	5	12	4	M	low
<i>Carpinus caroliniana</i> (N), (ST), (P), (SP)	Bluebeech	spring dig only	3	9	8	M	low
<i>Corylus colurna</i> (ST), (P), (SP)	Turkish hazel	spring dig only	4	14	8	M	medium
<i>Ostrya virginiana</i> (N), (P), (SP)	Ironwood	spring dig only	3	12	8	M	low

Bignoniaceae (Catalpa Family)

Genus / Species	Common Name	Notes	Zone	Height (m)	Spread (m)	Size	Salt Tolerance
<i>Catalpa speciosa</i> (ST), (P), (SP)	Northern catalpa		5	15	12	M	medium

Cornaceae (Dogwood Family)

Genus / Species	Common Name	Notes	Zone	Height (m)	Spread (m)	Size	Salt Tolerance
<i>Cornus alternifolia</i> (N), (P), (SP)	Pagoda dogwood	single stem moist soil	4	8	8	S	medium

Native (N), Street Tree (ST), Park tree (P) and Site Plan tree (SP)

Size: Small (S) = up to 8m / Medium (M) = 9 to 15m / Large (L) = greater than 15m

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Appendix C Specification CP 801.02 Recommended Species List for Street, Park and Site Plan Trees**Cupressaceae (Cypress Family)**

Genus / Species	Common Name	Notes	Zone	Height (m)	Spread (m)	Size	Salt Tolerance
<i>Thuja occidentalis</i> (N), (P), (SP)	Arborvitae / White cedar	spring dig only	3	15	3	M	medium

Eucommiaceae (Monotypic Family)

Genus / Species	Common Name	Notes	Zone	Height (m)	Spread (m)	Size	Salt Tolerance
<i>Eucommia ulmoides</i> (N), (P), (SP)	Hardy rubber tree	introduced on trial basis 2014	4	12	10	M	medium

Fabaceae (Pea Family)

Genus / Species	Common Name	Notes	Zone	Height (m)	Spread (m)	Size	Salt Tolerance
<i>Gleditsia triacanthos</i> 'Draves' (ST), (P), (SP)	Street Keeper locust		4	15	7	M	high
<i>Gleditsia triacanthos</i> 'Skycole' (ST), (P), (SP)	Skyline locust		4	16	10	L	high
<i>Gymnocladus dioica</i> (N), (ST), (P), (SP)	Kentucky coffee tree	male cultivar only	5	16	12	L	high

Native (N), Street Tree (ST), Park tree (P) and Site Plan tree (SP)

Size: Small (S) = up to 8m / Medium (M) = 9 to 15m / Large (L) = greater than 15m

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Appendix C Specification CP 801.02 Recommended Species List for Street, Park and Site Plan Trees**Fagaceae (Beech Family)**

Genus / Species	Common Name	Notes	Zone	Height (m)	Spread (m)	Size	Salt Tolerance
<i>Fagus sylvatica</i> 'Riversii' (P)	Rivers purple beech	spring dig only	4	15	10	L	low
<i>Quercus bicolor</i>	Swamp white oak	spring dig only	4	15	15	M	high
<i>Quercus macrocarpa</i> (ST), (P), (SP)	Bur oak	spring dig only	3	20	20	L	high
<i>Quercus robur</i> 'Fastigiata' (ST), (P), (SP)	Pyramidal English oak	spring dig only	5	15	6	M	high
<i>Quercus rubra</i> (N), (ST), (P), (SP)	Red Oak	spring dig only	3	18	16	L	high
<i>Quercus robur</i> x <i>Quercus alba</i> 'Crimschmidt' (ST), (P), (SP)	Crimson Spire oak	spring dig only	5	15	5	M	high

Ginkgoaceae (Ginkgo Family)

Genus / Species	Common Name	Notes	Zone	Height (m)	Spread (m)	Size	Salt Tolerance
<i>Ginkgo biloba</i> 'Princeton Sentry' (ST), (P), (SP)	Princeton Sentry ginkgo		4	13	5	M	medium
<i>Ginkgo biloba</i> (ST), (P), (SP)	Maidenhair tree		4	16	11	L	medium
<i>Ginkgo biloba</i> 'Magyar' (ST), (P), (SP)	Magyar Ginkgo	introduced on trial basis 2014	4	17	8	L	medium

Native (N), Street Tree (ST), Park tree (P) and Site Plan tree (SP)

Size: Small (S) = up to 8m / Medium (M) = 9 to 15m / Large (L) = greater than 15m

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Appendix C Specification CP 801.02 Recommended Species List for Street, Park and Site Plan Trees**Hippocastanaceae (Horse-chestnut Family)**

Genus / Species	Common Name	Notes	Zone	Height (m)	Spread (m)	Size	Salt Tolerance
<i>Aesculus hippocastanum</i> (P), (SP)	Common Horse-chestnut	spring dig only	5	18	16	L	medium
<i>Aesculus x carnea</i> 'Briotii' (ST), (P), (SP)	Ruby-Red Horse-chestnut	spring dig only	4	10	12	M	medium

Juglandaceae (Walnut Family)

Genus / Species	Common Name	Notes	Zone	Height (m)	Spread (m)	Size	Salt Tolerance
<i>Carya cordiformis</i> (N), (P), (SP)	Bitternut hickory	spring dig only	4	20	15	L	medium
<i>Juglans cinerea</i> (N), (P), (SP)	Butternut	spring dig only (on hold 2012)	3	16	13	L	low
<i>Juglans nigra</i> (N), (P), (SP)	Black walnut	spring dig only	4	18	18	L	low

Magnoliaceae (Magnolia Family)

Genus / Species	Common Name	Notes	Zone	Height (m)	Spread (m)	Size	Salt Tolerance
<i>Liriodendron tulipifera</i> (N), (P), (SP)	Tulip tree	Spring dig only	5	25	15	L	high

Native (N), Street Tree (ST), Park tree (P) and Site Plan tree (SP)

Size: Small (S) = up to 8m / Medium (M) = 9 to 15m / Large (L) = greater than 15m

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Appendix C Specification CP 801.02 Recommended Species List for Street, Park and Site Plan Trees**Nyssaceae (Flowering Tree Family)**

Genus / Species	Common Name	Notes	Zone	Height (m)	Spread (m)	Size	Salt Tolerance
<i>Nyssa sylvatica</i> (N), (ST), (P), (SP)	Black gum		4	10	7	M	medium

Oleaceae (Olive Family)

Genus / Species	Common Name	Notes	Zone	Height (m)	Spread (m)	Size	Salt Tolerance
<i>Fraxinus americana</i> 'Junginger' (ST), (P), (SP)	Autumn Purple ash	on hold from 2007 emerald ash borer	4	16	10	L	high
<i>Fraxinus pennsylvanica</i> 'Patmore' (ST), (P), (SP)	Patmore ash	on hold from 2007 emerald ash borer	4	18	8	L	medium
<i>Syringa reticulata</i> 'Ivory Silk' (ST), (P), (SP)	Ivory Silk tree lilac	single stem	2	7	5	S	medium

Native (N), Street Tree (ST), Park tree (P) and Site Plan tree (SP)

Size: Small (S) = up to 8m / Medium (M) = 9 to 15m / Large (L) = greater than 15m

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Appendix C Specification CP 801.02 Recommended Species List for Street, Park and Site Plan Trees**Pinaceae (Pine Family)**

Genus / Species	Common Name	Notes	Zone	Height (m)	Spread (m)	Size	Salt Tolerance
<i>Abies concolor</i> (P), (SP)	Silver fir	spring planting only	4	18	6	L	low
<i>Larix laricina</i> (N), (P), (SP)	Tamarack	spring planting only	1	20	9	L	medium
<i>Picea abies</i> (P), (SP)	Norway spruce	spring planting only	3	25	8	L	medium
<i>Picea glauca</i> (N), (P), (SP)	White spruce	spring planting only	2	25	5	L	low
<i>Picea pungens</i> (P), (SP)	Colorado spruce	spring planting only	2	20	6	L	medium
<i>Pinus strobus</i> (N), (P), (SP)	Eastern white pine	spring planting only	3	25	10	L	low
<i>Pinus sylvestris</i> (P), (SP)	Scot's pine	spring planting only	3	20	10	L	low
<i>Tsuga canadensis</i> (N), (P), (SP)	Eastern hemlock	spring planting only	4	20	8	L	low

Platanaceae (Plane Tree Family)

Genus / Species	Common Name	Notes	Zone	Height (m)	Spread (m)	Size	Salt Tolerance
<i>Platanus x acerifolia</i> 'Bloodgood' (ST), (P), (SP)	Bloodgood london planetree	introduced on trial basis 2014	4	20	20	L	medium
<i>Platanus x acerifolia</i> 'Morton Circle' (ST), (P), (SP)	Exclamation planetree	introduced on trial basis 2014	4	18	11	L	medium

Native (N), Street Tree (ST), Park tree (P) and Site Plan tree (SP)

Size: Small (S) = up to 8m / Medium (M) = 9 to 15m / Large (L) = greater than 15m

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Appendix C Specification CP 801.02 Recommended Species List for Street, Park and Site Plan Trees**Rosaceae (Rose Family)**

Genus / Species	Common Name	Notes	Zone	Height (m)	Spread (m)	Size	Salt Tolerance
<i>Amelanchier laevis</i> 'Spring Flurry' (ST), (P), (SP)	Spring Flurry serviceberry		4	12	7	M	medium
<i>Crataegus crus-galli</i> var. 'Inermis' (P), (SP)	Thornless cockspur hawthorn	spring dig only	4	8	8	S	high
<i>Malus</i> 'Dolgo' (ST), (P), (SP)	Dolgo crabapple		2	10	8	S	medium
<i>Malus</i> 'Profusion' (ST), (P), (SP)	Profusion crabapple		4	7	5	S	medium
<i>Malus</i> 'Red Splendour' (ST), (P), (SP)	Red Splendour crabapple		3	8	8	S	medium
<i>Malus tschonoskii</i> (ST), (SP)	Pillar apple		4	10	5	M	medium
<i>Pyrus calleryana</i> 'Cleveland Select' (ST), (P), (SP)	Cleveland Select pear	spring dig only	5	9	5	M	medium
<i>Pyrus calleryana</i> 'Chanticleer' (ST), (P), (SP)	Chanticleer pear	spring dig only	5	10	4	M	medium
<i>Sorbus thuringiaca</i> 'Fastigiata' (ST), (P), (SP)	Oakleaf mountain ash		4	7	3	S	low

Rutaceae (Citrus Family)

Genus / Species	Common Name	Notes	Zone	Height (m)	Spread (m)	Size	Salt Tolerance
<i>Phellodendron amurense</i> 'Macho' (P)	Seedless amur cork tree	Low branches. Not suited to ST or SP	4	12	10	M	high

Native (N), Street Tree (ST), Park tree (P) and Site Plan tree (SP)

Size: Small (S) = up to 8m / Medium (M) = 9 to 15m / Large (L) = greater than 15m

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Appendix C Specification CP 801.02 Recommended Species List for Street, Park and Site Plan Trees**Tiliaceae (Linden/Basswood Family)**

Genus / Species	Common Name	Notes	Zone	Height (m)	Spread (m)	Size	Salt Tolerance
<i>Tilia americana</i> 'Redmond' (ST), (P), (SP)	Redmond American linden		3	17	10	L	low
<i>Tilia cordata</i> 'Greenspire' (ST), (P), (SP)	Greenspire linden		3	15	10	L	low
<i>Tilia tomentosa</i> 'Sterling' (ST), (P), (SP)	Sterling silver linden		4	15	12	L	low

Ulmaceae (Elm Family)

Genus / Species	Common Name	Notes	Zone	Height (m)	Spread (m)	Size	Salt Tolerance
<i>Celtis occidentalis</i> (N), (ST), (P), (SP)	Common hackberry		3	20	18	L	medium
<i>Celtis occidentalis</i> 'Chicagoland' (ST), (P), (SP)	Chicagoland hackberry		3	16	13	L	medium
<i>Celtis occidentalis</i> 'Prairie Sentinel' (ST), (P), (SP)	Prairie Sentinel hackberry		4	15	4	M	medium
<i>Ulmus propinqua</i> 'Emerald Sunshine' (ST), (P), (SP)	Emerald Sunshine elm		4	13	10	M	medium
<i>Ulmus wilsoniana</i> 'Prospector' (ST), (P), (SP)	Prospector elm		4	18	15	L	medium

Fruit Tree varieties may be selected for Community Gardens
Species/cultivars not listed will be considered by the City

Native (N), Street Tree (ST), Park tree (P) and Site Plan tree (SP)

Size: Small (S) = up to 8m / Medium (M) = 9 to 15m / Large (L) = greater than 15m

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