

**S. Rowland**

B: Tree Planting Strategy - Backgrounder



# PLANT MORE

BACKGROUND DOCUMENT



London  
CANADA

# INTRODUCTION

**“A healthy, diverse and extensive urban forest for today and the future. London is the Forest City.”**

**- City of London Urban Forest Strategy (2014) Vision Statement**

Until 2014 the City planted an average 2,500 street trees, 150 park trees and, with partners in the Million Tree Challenge, about 3,000 naturalization plants each year. Allowing for mortality in establishment this was just about sufficient to replace tree losses each year. Since 2015, City planting efforts have increased to 5,000 trees on average each year, with 2,500 of those contributing to a future increase in canopy cover.

To achieve our goal of 34% tree canopy cover by 2065, up from 23.7% in 2015, we need to plant many more trees each year across private and public lands. This is a dramatic increase, and it will require close working with nurseries and growers, businesses, residents, and multiple City service areas to achieve the goal. This Planting Strategy provides the framework from which to develop City programs, incentives and projects to achieve enhanced tree planting and better care of existing trees.



# WHY DO WE NEED MORE TREES?

We need more trees to maintain and enhance our quality of life as more of us choose to live in the City. Trees provide many benefits to society that help make our City enjoyable, functional and attractive. These include:

## Human Health and Well-being

- Reduces sun exposure; reduced risk of skin melanoma cancer
- Reconnection with nature; better mental health
- Reduced air pollution; reduced risk of respiratory ailments
- Faster recovery from illness, with fewer pharmaceuticals; reduces health care costs
- Reduced stresses and illness associated with urban heat effects

## Social/Cultural

- Sense of place and identity; distinctive neighbourhoods and streets
- Encourages outdoor activity and meeting others; improves social cohesion

## Economic

- Enables energy savings; provides shade and cooling
- Increases property values by about 10%
- Increases retail turnover (Wolf, 2014)
- Reduces stormwater flows and nutrient loads; costs less to provide clean water
- Avoids or defers costs of infrastructure repair

## Environmental

- Provides habitat and greater biodiversity
- Supportive of carbon trading opportunities
- Supports ecosystem goods and services

It is rare that a tree in an urban environment achieves its natural life expectancy. An average 50-year life cycle has been assumed based on research in other cities. Many trees planted are small, ornamental types of limited useful life expectancy averaging around 20 years. Trees planted in streets as shade trees have an average 30 years life expectancy; those in parks and large yards 75 – 100 years. To achieve the 2065 goal of 34% canopy cover, close to 50,000 trees are required to be planted every year, to provide canopy cover to 2,430 more hectares inside the Urban Growth Boundary. That is approximately the same as 400 Victoria Parks at 100% tree canopy.

Four main actions have been identified to support the Strategy:

1. Implement Planting Strategy for Achievable Canopy Cover Targets
2. Plant More – On Public Lands
3. Plant More – On Private Lands
4. Plant Better – Implement Best Practices



## I. IMPLEMENT PLANTING STRATEGY FOR ACHIEVABLE CANOPY COVER TARGETS

### ACTION

*1.1 Reduce new tree mortality in year 1 to 4% or less, and no more than 3% mortality in year 2 and 2% mortality in year 3.*

The highest mortality usually occurs in early establishment years, which may be due to transplant shock, poor planting techniques, planting timing (unseasonal drought, for example) or a problem in handling and managing the trees before they are planted. For City plantings, across all types of City lands, using professional labour and inspected stock, an estimate of 10% loss in year 1, 5% in year 2 and 2% in year 3 has been assumed. For plantings by private citizens, 8% mortality in each of years 1 – 5 (40% mortality by end of year 5) has been assumed. These figures, and the calculations resulting from them, are based on research from other places and may be amended as London-specific and site-specific data is obtained from the Computerized Maintenance Management System (CMMS) database and tree planting partners in the future. It is anticipated that mortality rates will differ across a range of site-types and Place types.

If the City achieves the goal of reducing mortality to no more than 4% in year 1, 3% in year 2, and 2% in year 3, and all other assumptions, factors and planting efforts remain as planned, then the effects of that reduced early mortality will be:

- average tree life span is extended from 50 years to 55.5 years;
- the trees the City needs to plant to meet its portion of the 2065 canopy cover target will all be in the ground by the end of 2040, with allowing for mortality; tree replacement would continue after 2040 but at a much reduced rate of approximately 2,600 trees per annum to maintain the tree canopy cover that pre-existed;
- avoid \$29 million (\$1.2 million per year, or \$4.8 million per 4-year budget cycle) of funding over the remaining life of the Planting Strategy (2041-2065).

The Planting Strategy will be amended as needed to recognize reductions in tree mortality.

*1.2 Implement a long term communications strategy to educate and engage citizens about tree protection and planting goals.*

Approximately 15% (one sixth) of all proposed City tree planting on streets or in Parks does not occur due to homeowner or business owners declining tree planting on City-owned lands adjacent to their own. Pressure from residents or business owners to adapt the City's trees to their personal preferences remains an ongoing issue, where a resident or business owner sees the City lands as an extension of their own. If there has been a long-standing blurring of property lines, for example with cultivated boulevards that extend to the front steps of a home, it is especially difficult for the City to initiate or change anything without explicit approval of the private landowner.

When considering the effort and costs involved in the design and development of a City to make provision for trees, this is a significant loss.

Plantable space left unplanted because of the wishes of one or a few people, some of whom may remain resident in that place for only a short time, is placed on a wait list, and may be planted at the next available opportunity some years in the future.

It should be noted that other municipalities including Toronto do not consult with citizens when planting trees on City lands. It is recommended that London no longer extends the opportunity to citizens to refuse to accept a tree on adjacent City lands.

### *1.3 Assess supply and implement programs to provide suitable trees in a range of species and sizes for future needs.*

The City shall work with partners, regional nurseries and planting contractors to develop and implement by 2020 when the next budget cycle is to be approved, a multi-year plan and contract(s) for the supply of the type, quality, number and species of trees required. More than one contract may be necessary to supply all types of trees in all sizes and species required. Examples to consider include:

- similar to the County of Wellington's Green Legacy program, where small sized native species stock is produced with assistance from school children and given away to the local community;

- a tree farm utilising vacant City lands;
- long-term tree supply contracts with existing local growers;
- a municipal cooperative, where multiple municipalities share resources to operate tree farms or nurseries across the region, and so reduce the consequences of a catastrophic tree crop failure in any one place.

To this end, the City is working with ReForest London with funding from the Ontario Trillium Foundation Seed Grant to assess options and develop a plan.

Tree species must:

- be tolerant of extended periods of extreme heat in summer, hardy enough to survive winter chill to -30 degrees and resilient to withstand fluctuating freeze-thaw cycles;
- be tolerant of drought conditions after establishment;
- be tolerant of flash-flooding or inundation for a few days at a time;
- contribute to wildlife habitat for native and migratory fauna;
- be attractive, with form, colour, flower and/or scent appealing to the community;
- provide a significant canopy for shade and cooling;
- have low allergenic qualities by producing little pollen, sap or other part known to cause allergic reaction;
- be physiologically robust, growing with moderate vigor;
- be resilient to pests and diseases that are endemic in the City;

- be tolerant of a range of soils, notably clay, but also undifferentiated disturbed soils of poor structure and quality;
- be available, and not too costly.

#### *1.4 Plant the largest-growing and longest-lived species suitable for that location.*

It costs about the same whether a small-growing tree species or a large-growing tree species is planted. But the longest-lived and largest-growing species will, on average, provide the best return in investment. This means assessing planting locations for their adequacy to support long term growth, since each tree planted should survive not less than 50 years on average if its return on investment is to be maximized.

Many trees on public and private lands within the City are removed well before they become physiologically mature, but larger-growing species provide a better return on investment than a smaller-stature tree over the same time. Tree height is fixed in people's minds when deciding to plant a tree, and is usually the first question asked at tree giveaway events. Most people imagine that the tree will attain its mature height very quickly, but in the urban environment mature height is achieved over a time that often exceeds human lifespan. A shade tree species that might take a hundred years or longer to achieve its full potential in an urban area may provide very appropriate amenity, shade and other tree benefits for many decades, long after the person that planted it has moved on. A small tree with a low canopy may actually have a

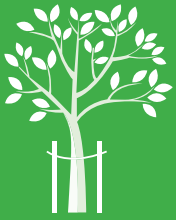
bigger impact on enjoyment of a space, compared with a larger tree that grows up and 'out of the way'.

Right Tree, Right Place may mean:

- Educating people about choosing the largest-growing species for the location;
- Choosing the right species for the purpose – privacy; protection; colour, etc.;
- Plant in locations to mitigate impacts of climate change and Urban Heat Island Effect e.g. maximize shade benefits from the tree by planting on east, south and west sides;
- On arterial and secondary roads, choose tree species (which may be non-native species) with proven tolerance to road salt, ozone and other contaminants or particulates;
- Avoid following fads, fashions or trends – it is quite common to find the supply chain will heavily promote or push a species or narrow range of species of trees for a few years, but these species may not be suitable.

#### *1.5 Prioritize City planting by (1) low tree canopy cover areas (2) largest area available (3) ease of planting.*

- This could be supplemented by (4) to reflect social needs (e.g. (inverse average household income) x (human population)). Identifying areas to be planted first is vital with limited resources, while recognizing competing interests.



## 2. PLANT MORE – ON PUBLIC LANDS

### ACTION

#### *2.1 Naturalize wherever possible.*

Naturalization involves planting a close-spaced mix of trees and shrubs with the expectation that over time a few will develop into upper canopy trees and others will remain as under-storey, or be out-competed and die. Canopy closure happens earlier, around 17 years after planting and after about 25 years, natural regeneration may begin. It costs about the same to plant one hectare by naturalization using volunteer labour, as it does to plant one hectare of caliper trees by a contractor, planted at wide spacing to allow for anticipated mature tree size with mowing in-between. However, by 50 years from planting and with no tree replacement, the tree canopy cover by naturalization is close to 100% while the alternative is only 7% cover.

#### *2.2 Identify and protect potentially plantable boulevard space before licensing for private purposes.*

The City shall consider trees, the potential of plantable space and any vacant tree pits in decisions to issue boulevard parking permits, understanding the opportunity cost of not having a tree there. Based on The London Plan policies that require tree planting within the public realm, it is suggested that the City shall require appropriate cash in lieu of tree planting if plantable space is removed (even temporarily) under such permits.

#### *2.3 Assess encroachments of City lands and implement restoration or licensing; allocate realized fees to tree planting and tree maintenance programs.*

The occupation of City lands by unauthorized encroachments, including structures, parking spaces, fences and gardens, is reducing and will continue to reduce the City's ability to provide long term tree canopy cover.

#### *2.4 With London Hydro, achieve appropriate planting of small, medium and large stature trees within tree-height distances of power lines.*

To help achieve our goals we need to find more plantable spaces in proximity to overhead and underground service and supply wires, with clear understanding of the parameters for deciding where to plant what type of species, and how to maintain trees within safe operational limits.

#### *2.5 Maximize shade tree planting on public lands.*

Maximize shade tree planting in planned use/park designs and elsewhere, ensuring soil and site history characteristics are fully considered in the process.



### *2.6 Plant more climate-appropriate conifers.*

Greater diversity across the range of appropriate coniferous and hardwood species will enhance urban forest resiliency and tree benefits e.g. conifers help to counter pests that target hardwoods, and also provide wildlife shelter year round.

### *2.7 Utilize vacant public lands for tree planting.*

The success of the Planting Strategy will not only be supported by increased tree planting in parks and streets. Other lands in the control of other City service areas such as Fire Halls, offices, operations yards, pollution control centres, property tax default acquisitions and vacant lands unlikely to be developed over the long term should also be planted to support the Strategy.

### *2.8 Prepare detailed 5-year planting plans by neighbourhood, to enhance the urban landscape and restore natural heritage or cultural landscapes.*

In 2016, the City acquired a new tree canopy cover layer in GIS, and a new polygonized layer of existing hardscape including but not limited to buildings, roads, parking lots, swimming pools, decks, patios, sidewalks, private paths, and driveways. After deducting the hardscape layer, and the tree canopy cover layer, what remains is the maximum plantable space. This information will be used together with Place type (from the London Plan, the new Official Plan) to identify how much

additional tree planting can realistically be achieved, and where. All City By-laws and policies to support tree canopy targets should be reviewed and revised to support this.



### 3. PLANT MORE – ON PRIVATE LANDS

#### ACTION

#### *3.1 Support planting and continual care of food-bearing trees.*

An increasing interest in urban agriculture has led to more asks for fruit trees on City lands. Fruit trees have proved to be popular at tree giveaways. Public education and outreach for long term maintenance of those trees is still required, to ensure they remain productive and accessible. The City has helped establish one Food Forest and is about to create a new community orchard where gleaning and distribution of surplus fruits is planned, which will help overcome some potential conflicts from unwelcome wildlife.

Unfortunately fruit trees are small in stature and canopy and add less to the canopy cover goal than a larger tree that may have been accommodated in the same space. Priority should still be to plant the largest possible tree for the location.

#### *3.2 Continue and expand tree planting initiatives by or for persons with disabilities.*

Differences in socio-economic status and physical ability have a significant effect on the participation of the community in planting of trees. Persons with disabilities may find it challenging to plant a tree unaided. Many households may decide that planting trees is too expensive, a luxury of no benefit in their lifetime, and a very low priority relative to other

household and quality-of-life decisions. The City has successfully given away many thousands of trees over recent years to enthusiastic recipients, and recently with ReForest London has been able to offer a free tree planting service and free trees to persons unable to collect and plant a tree themselves. The City and its partners will need to continue to ensure persons with disabilities can participate in programs, grants and services offered to support tree planting.

#### *3.3 Collaborate with community partners to identify new, and support existing, programs, such as the Million Tree Challenge.*

To maximize participation by citizens who may not place a high priority on tree planting, a number of different incentives will need to be developed over the life of the Planting Strategy, to appeal to different groups. The TreeMe grant program eligibility rules will have to change from year to year to align it with the goals of this Planting Strategy, with maximum participation encouraged through public communication. The City will continue to give away free trees on National Tree Day, but other enticements might include:

- subsidising purchases from local growers, through a voucher scheme;
- fee-paid City services provided at a discount, or for free;
- special rewards and recognition by Mayor and Council.

### *3.4 Create a tool lending library; donate tree care equipment.*

With infill and upward growth of built forms, many City residents will not have regular or frequent need for a shovel, watering can or bucket, stake, tie, tree shelter, tree guard or pruners. All of these items can add considerably to the cost of planting a tree. With its partners, the City aims to create a tool lending library and give away appropriate tree care equipment. In the past, the City has given away perforated buckets for watering trees.

Other ideas include a water meter fee rebate so a homeowner may receive a bucket, watering can or hose, adopt a street tree, park tree, or plant one of their own, and receive a deduction in their water bill for a year.

### *3.5 Plant City trees in private yards if there is insufficient space on nearby City land.*

Take inspiration from Toronto's LEAF and similar programs to plant City trees for free on private lands, include rear and front yards. The tree, once planted, becomes the property of the homeowner.

### *3.6 Enter into partnerships to plant and manage trees on institutional lands to benefit the wider community.*

There is a large amount of plantable space in the institutional Place Type (including hospitals, schools, shelters and hospices). Institutions rarely have sufficient budget to provide for the planting and care of trees. Indeed, many may consider trees as a liability, not an asset, because of the cost of maintaining

them and the perceived risks of having trees on their grounds. Yet in Toronto, schools are targeted for increased shade tree planting with a shade tree policy in place, intended to limit the exposure of young children to the sun and so to reduce the incidence of skin melanoma in adulthood.

The City will explore public: private partnerships where the City may assume the responsibilities for planting and managing shade trees on institutional lands to meet the tree canopy cover goals for that Place Type, to realize the benefits of shade trees for the persons using that institution, and to benefit the wider community.



## 4. PLANT BETTER – IMPLEMENT BEST PRACTICES

### ACTION

*4.1 Start the process to improve species diversity. Prioritize species origin & provenance (1) native to Ontario (2) native to North America (3) non-native. Implement assisted migration where appropriate. Avoid any species that is invasive.*

Native species do not always perform well in highly modified urban environments, and those native species that have been relied upon in the past may struggle to adapt to climate change. Tree species from warmer climates, such as the lower United States, may be suitable for and assisted in their migration to the City by intentional planting in selected urban sites when their performance and potential for introducing harm, by harbouring of pest, disease or tendency to invasiveness, is known. Existing native species at the southerly limits of their range in this region may be pushed to extirpation; for example, white spruce is not predicted to survive in London after about 2040. Native tree species currently in London at their northern-most limits of their range may take advantage of a species vacancy and some may express invasiveness as competition for limited resources changes.

*4.2 Amend by-laws and tree planting guidelines to require more trees be planted and to ensure optimal establishment rates through regular watering and tending.*

This is aimed at supporting a policy of no net loss of tree canopy. More trees are

planted with appropriate soil volumes, soil quality, storm water management and maintenance, to maintain function and design and reduce mortality.

*4.3 Revise planting standards to optimize soil volume, soil quality and other factors for success.*

The overall aim shall be to invest time, money and resources into growing the largest and longest-lived trees to thrive for 50 years or longer. Research has shown that there is a direct link between the amount of available soil and the health, size and longevity of trees. If a planting location has less than 25m<sup>3</sup> (e.g. 1m deep x 5m wide x 5m long) of quality, useable soil volume, it will be unlikely to support a large-growing tree for 50 years. Assessing planting locations to support long term growth is essential to success, there needs to be available space both above and below ground. Augmenting of planting locations to improve soil quality and volume may often be necessary.

In the past it has been common practice to plant trees at a spacing based on their anticipated fully mature size – but as this growth is rarely achieved in an urban environment this approach may not fully utilize the “plantable” space.

*4.4 Implement better physical tree protection measures.*

Accidental damage from mowing machines and weeding equipment remains a significant cause of death



of young to semi-mature trees. This is avoidable damage, by the use of physical tree protection such as bollards, stem guards, stakes and fences. Mulching can also be a protection measure, by removing the need to get too close to the tree to mow or weed it.

#### *4.5 Monitor success of reducing mortality and adjust Planting Strategy as needed.*

Tree planting results shall be collated by staff from partners, stakeholders and internal Divisions, and presented annually in review to the Trees and Forest Advisory Committee. The City shall utilize the new CMMS to monitor, maintain and replace trees more efficiently. The expectation is that the Planting Strategy will be amended as necessary every five years. Usually this review will be in May each year to coincide with the spring Urban Forest Strategy update.

#### *4.6 Apply maximum parking requirements, to support 30% canopy cover with shade tree planting*

This is from the London Plan. By applying maximum parking requirements instead of minimum, space could be made available for planting of trees. Shade tree planting can increase the life of grey infrastructure, so long as it is well designed with adequate soil volumes. Utilizing underground planting tools and techniques e.g. root deflectors; modular suspended load-bearing cells, will assist in long term presence of suitable species of shade trees where parking is maximized.

# WRAP UP

Implementing this Planting Strategy from 2017 – 2021 will be a challenge. The City and its partners will need to ramp up their efforts significantly and work in even closer collaboration to achieve early results anywhere close to the annual target of planting around 50,000 trees each year. Success in these early years will be dependent on the endorsed Strategic Investment budget and developing the supply of trees as these are critical limiting factors. Additionally, City service areas and the community must all work together to reduce early mortality in new trees, and to find creative ways to retain existing tree canopy cover if we are to achieve our goal of 34% tree canopy cover by 2065.

Continual monitoring and measuring of the number, type and locations planted will better inform our future needs, any shortfalls, and where planting efforts should be prioritized. Through a planned process of annual reporting to the Trees and Forest Advisory Committee, the City will continue to modify its Planting Strategy to ensure that it remains on track to achieve the goal. Strong incentives and better communication between the City and its citizens is essential to creating and maintaining momentum for the next 49 years, so that London can continue to be the Forest City.