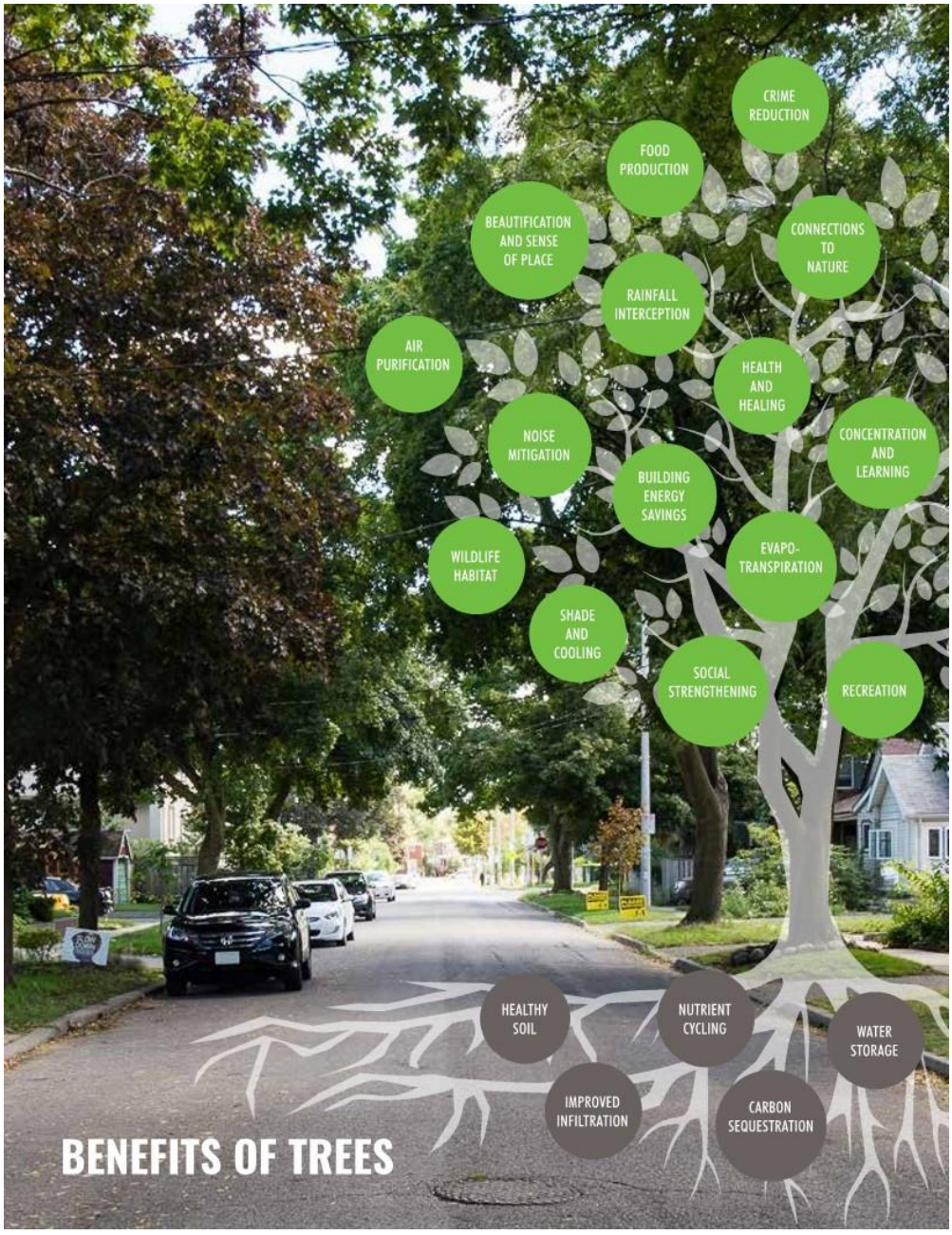
Tree Canopy Analysis & Review

Most people love the autumn, with temperatures cooling off and the trees turning into beautiful colours. So many things to enjoy after a hot summer. Of course, as there is with most good things, there is a downside. Eventually, if you have a tree in your yard or your neighbour does, you will have to spend several back-breaking hours raking up the hundreds of thousands, millions even, of leaves that fall. Then you read of some neighbours, even a residents' association that is opposing the removal of several of these polluting monsters by a developer who just wants to build a better home. **Who cares?** I mean what have trees done for me lately? Well, as it turns out they have done quite a bit and very quietly.

Toronto Tree Canopy Study, 2018



Here are 10 of the most obvious advantages of trees, especially mature ones

1. **Heat reduction:** Studies show that even low-density trees in a suburban community can significantly reduce the **air temperature**. In most cities the areas of highest air temperatures during the summer are those with the lowest tree density and are typically in poorer marginalized communities. This is true in Toronto. Trees provide shade for homes, office buildings, parks and roadways, cooling surface temperatures. They also take in and evaporate water, cooling the air around them.
2. **Air pollution reduction:** Trees absorb carbon and remove pollutants from the atmosphere.
3. **Water quality improvement:** Trees act as water filters, taking in surface water containing suspended soil and absorbing nutrients into the soil. They also help stabilize soil, reducing soil erosion.
4. **Energy emissions reduction:** Trees reduce energy costs by over $4,000,000,000 a year. Tree shading on buildings reduce air conditioning costs. Remove the trees and your buildings heat up, requiring increased air conditioning, increasing the burning of fuel at the power plants, increasing emissions and associated pollution. They also act as wind breaks, reducing the cooling effects of high winds and the associated need for increased heating.
5. **Flooding reduction:** Urban trees intercept and return **more rain** to the atmosphere than trees in forested environments. Together with the delay in runoff, trees can act as an effective stormwater management tool on individual properties, preventing costly basement flooding.
6. **Noise reduction:** Trees are used as natural noise deflectors along highways, fences and between roads and neighborhoods, reducing noise levels. They also add sound through birds chirping and wind blowing through leaves, noises that have shown psychological benefits.
7. **Protection from UV radiation:** Trees absorb 96% of ultraviolet radiation.
8. **Improved aesthetics:** Trees and leaf cover improve the looks and value of any property and may add $1300 to $13000 to property values.
9. **Improved human health:** Many studies have found connections between exposure to nature and better mental and physical health. Some hospitals have added tree views and plantings for patients as a result of these studies, resulting in reduced pain medications and shorter stays. Doctors prescribing walks in nature for people of all ages due to evidence that nature exposure lowers blood pressure and stress hormones. Studies have also associated living near green areas with lower death rates.
10. **Wildlife habitat:** A broad diversity of birds, animals and insects rely on trees for shelter, food and nesting.

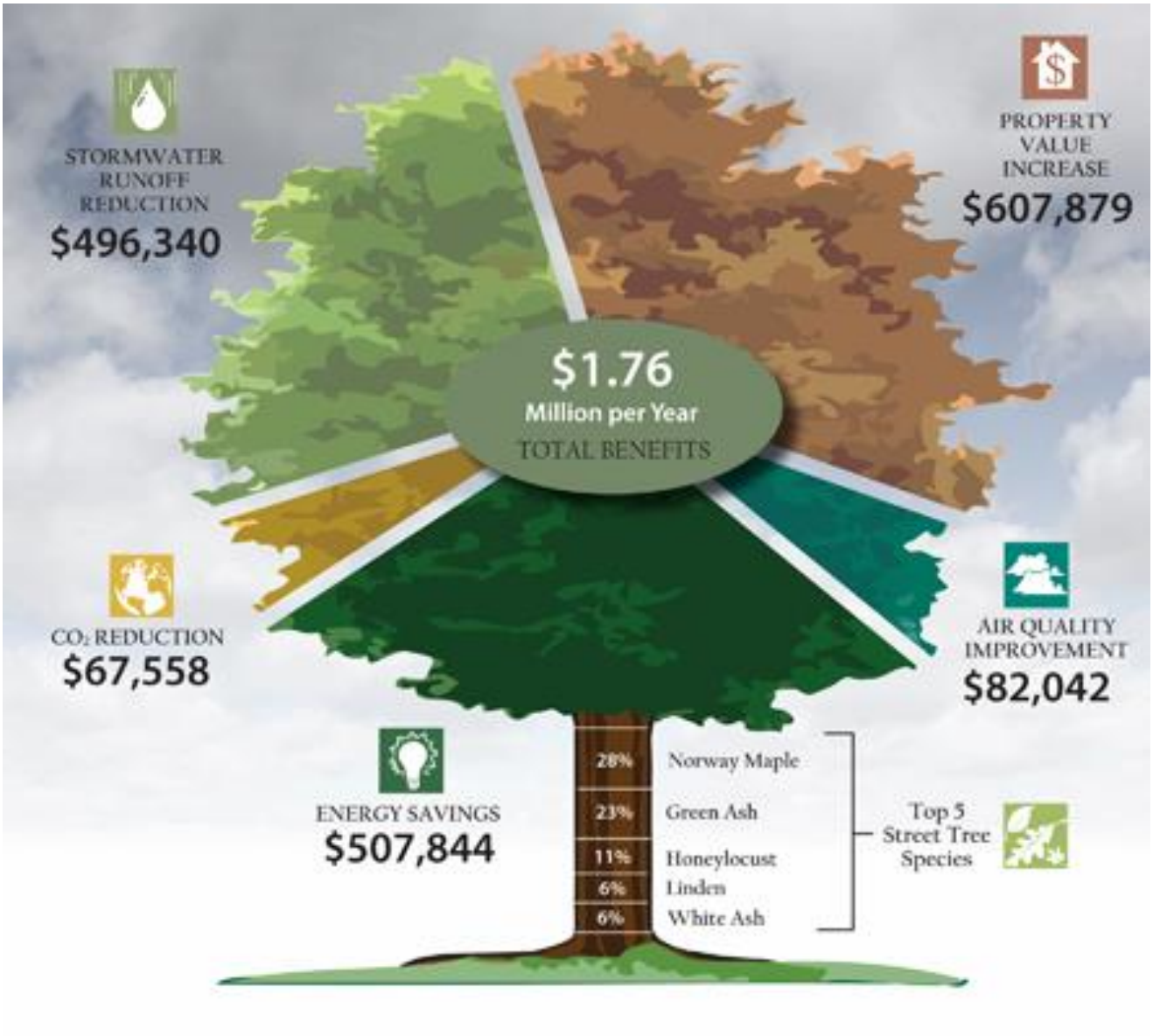
The value of trees towards **carbon sequestering** (removal of excess carbon from the atmosphere to maintain a balance) and other benefits increases with the age of a tree, especially as the surface area of the leaves increases. Consequently, while we should applaud the awarding of the **Champion of Trees Award** to Toronto, we must also bear in mind that the major contributions of new tree planting require decades of growth to

become appreciable. We cannot afford to remove large numbers of mature trees and rely on the planting of new tree to adequately replace them.

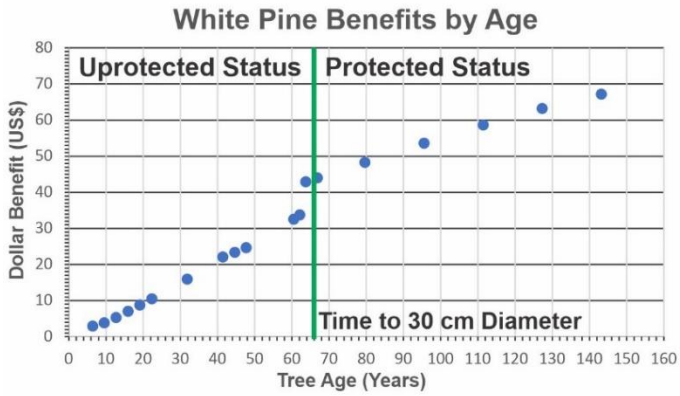
With the effects of climate change increasing we simply do not have the time.

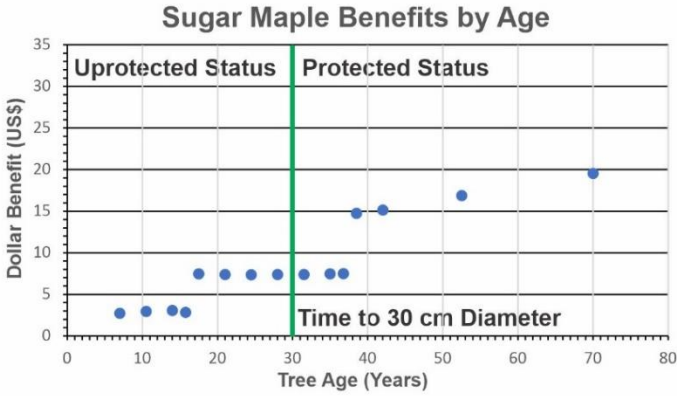
If you want to find out the contributions and worth of your trees, visit https://mytree.itreetools.org/#/tree and find out.

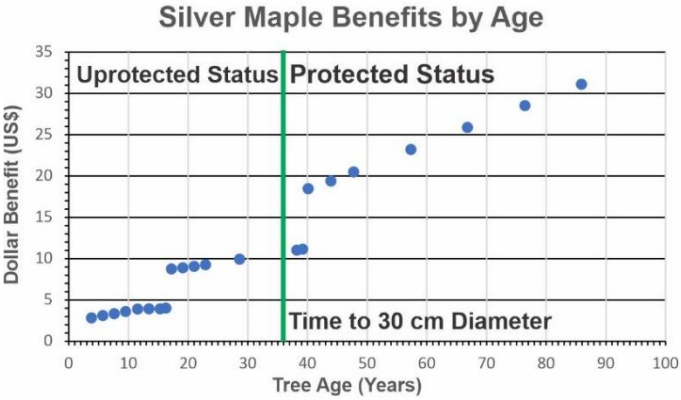
Source: iTreetools.org Data for Portland, Oregon, 2014 in $US

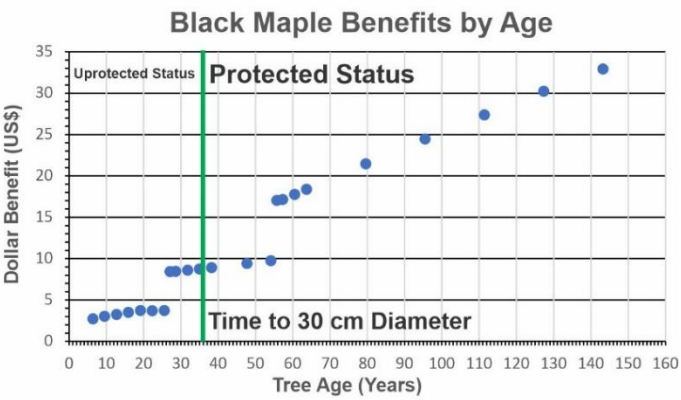


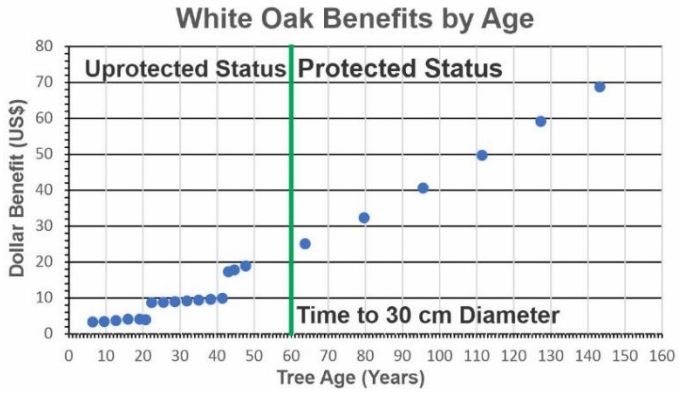
Total Benefits (US$) of 6 Common Trees Planted in Toronto

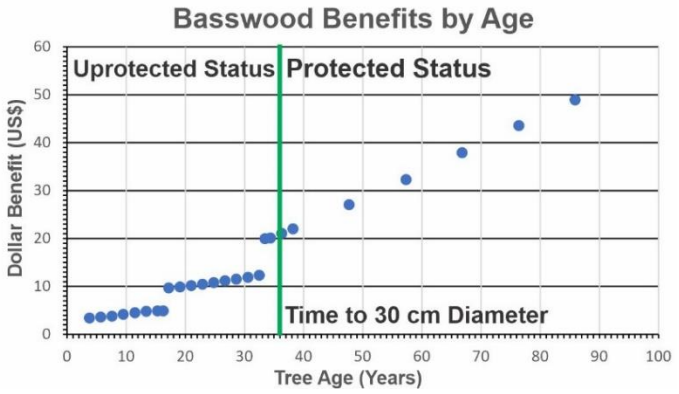












Summary of Common Toronto Tree Characteristics and Benefits

			Cumulative Benefits Over 75 Years			
Tree Species	Lifespan (Years)[1]	Time to 30 cm Diameter (Years)[1]	Overall Benefits (C$)	CO2 Sequestered (kg)	Rainfall Runoff Prevented (litres)	Air Pollution Removed (C$)
White Pine	200	66	2,099	1,234	164,345	229
Sugar Maple	75	66	1,045	1,369	151,390	121
Silver Maple	100	36	1,396	4,206	207,356	193
Black Maple	200	60	898	2,159	132,101	104
White Oak	200	60	1,294	1,370	222,917	457
Basswood	150	36	1,887	2,269	363,081	290

[1] Will vary with characteristics of where tree planted and ambient climate

All scenarios were conducted using iTree v2.11.1 assuming **Good** tree condition and the same location parameters

Annual Ecosystem Services Performed By Toronto's Trees, 2018 (Source: 2018 iTree Eco data) From: 2018 Toronto Tree Canopy Study

Benefit	Total Benefit (C$)
Energy Savings	8,279,540
Gross Carbon Sequestering	4,039,488
Pollution Removal	37,909,683
Avoided Runoff	4,845,926
Total Annual Benefits	**55,074,637**

City planners, investors and property owners appear **unaware of the enormous benefits that a mature canopy provides as described.**

In the current journal, *Environmental Pollution (193, 2014 p119-29),* forester **Dave Nowak and colleagues** found that trees prevented 850 human deaths and 670,000 cases of acute respiratory symptoms in 2010 alone. That was related to **17 tonnes of air pollution removed by trees and forests**, which physically intercept particulate matter and absorb gases through their leaves.

Nowak's current study put the total **annual value of pollution removal by U.S. trees at $86 billion.** (July 2014 The Atlantic. The Health Benefits of Trees by James Hamblin, MD. Lecturer at Yale School of Public Health).

Conducted over 18 years, research from the U.S. Forest Service has found a correlation between tree loss and human mortality. According to their findings, the loss of trees was associated with about seven additional deaths per year from respiratory causes and almost 17 additional deaths per year from cardiovascular causes per 100,000 adults. That, say researchers, comes out to more than 21,000 deaths in total. It seems **trees have a value that goes far beyond dollars and cents!**

Green space is always an afterthought. This must be reversed.

b) Mature trees, destroyed from *'as-of-right'* development, **may be** replaced by new sapling trees. They are often planted in environments which are **unsuitable** or do **not** have the capacity to allow for full tree growth and that which maximizes the growth opportunity of the trees.

Many condo boulevards along Kingston Rd. are a perfect example. The **lack of care and maintenance** of these trees also leads to decline, poor performance and death. Urban trees typically grow slower than their forest counterparts due to additional stressors; thus, they need nurturing protection.

General statement

1 Perceive Cities as part of nature; grow more urban and more green.

2 Include the involvement of TRCA and Parks Department in every Neighbourhood Plan.

Each neighbourhood has distinct features and should **not** be addressed in a blanket manner.

3. With regard to our building regulations, **commit** to the Provincial Policy Statement:

"Green infrastructure: means natural and human made elements that provide ecological and hydrological functions and processes. Green infrastructure can include components such as natural heritage features and systems, parklands, stormwater management systems, street trees, urban forests, natural channels, permeable surfaces, and green roofs."

Document created by Alan Burt, Director of CSVSWRA