

Q: HOW MANY TREES IS ENOUGH?

Q: Where Are The Trees Going, and Who Is Planting Them?

Assumption: Past planting predicts future: What we have done in the past we will continue to do in the future.

The City will continue to plant as many trees as it has always done (about 2,600 per annum) from a range of species that are known to do reasonably well in urban areas.

Everyone else will continue to plant trees as they can afford, or that they must plant according to the rules of yesterday and today.

Urban Forest Strategy (2014): What we now need to do is PLANT MORE. More species, more diversity; more trees, more densely. *Urban human health depends on it.*

“SUGAR MAPLE TREE EQUIVALENT” SMTE

Rate species vs. growth rate and proportions of a sugar maple

6m crown diameter at age 20; 15m crown diameter at age 50*

> 1 SMTE: e.g. tulip tree, sycamore, poplar, some conifers

< 1 SMTE: e.g. hawthorn, crab apple, Ivory Silk lilac, birch, many conifers

*Canopy depth (vertical) does not count in target, only the horizontal spread

TARGET TREE CANOPY COVER

Where we were, where we are now, and where we need to get to

Year	2008	2015	2035	2065
Tree Canopy Cover (% of Urban Growth Boundary area)	24.7%	23.7%	28% (up 4.3%)	34% (up 10.3%)
How many SMTEs would need to be planted yearly starting 2017 – as an equal number planted every year?			124,500	45,000

1% = ~236 ha

MORTALITY ASSUMPTIONS

	Municipality	Everyone Else
Year 1	10%	8%
Year 2 – 5 (each year)	1.84%	8%
Years 6 onwards (each year)	1.84%	1.3%
Average life cycle (urban)	50 years	

- One-fifth (0.4%) of the average 2% attrition rate *may* regenerate naturally. Opportunities to regenerate naturally in urban areas are few.
- The remainder (1.6%) is replaced by growth that year among residual tree canopy cover. *But the modern trend is for smaller, slower and shorter-lived stock – and fewer, as costs rise (supply issue)*
- Failure to recover 0.4% of total tree canopy cover lost through attrition is possible each year
- On average, of every 100 trees present or planted today, 2 will still be here in 2065
- On average, every tree has a 1-in-50 chance of still being here the next year

So, with mortality, if we plant an EQUAL number of SMTEs every year, 45,000 SMTEs would have to be planted every year from 2017 to reach the 2065 goal of 34% canopy cover

MAJOR ISSUES TO ADDRESS

<p>Opportunity Costs:</p> <p>“Highest and Best Use”</p> <p>= tree canopy target?</p>	<ul style="list-style-type: none"> • Development – all types • Boulevard parking • Street furniture, lights, signs • Billboards • Line of Sight- business signs, windows, doors • Double-wide driveways • Sidewalks • Snow storage • Play spaces, sports fields, manicured turf • Meadow; ecological mosaic
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<p>Shift in planting design – a blend of two types:</p>	<p>Final Spacing approach (manicured)</p> <p>Enough SMTEs planted at the right spacing for eventual mature dimensions; tends to ignore mortality; mortality results in a gap that will take more time to fill</p> <p>Caliper trees for immediate landscape impact, visibility and resiliency vs. vandalism, mowers, etc</p> <p>Low density – canopy is scattered; individual trees may become broad rather than tall, and may require more pruning</p> <p>Little contingency for mortality other than to replace (often the same species) in the same place</p> <p>Mow in-between (manicured) – minimum spacing based on machinery width</p>	<p>Forestry approach (not manicured)</p> <p>Plant more, smaller, cheaper</p> <p>10 plants = 1 SMTE</p> <p>Accept 85% establishment or better by year 3</p> <p>Higher density, anticipates losses, more use of available space</p> <p>Down-the-road cost to re-space at canopy closure to best location, best specimens – or leave to nature</p> <p>No mow - or mow less often; interplant; weed and mulch</p> <p>More diverse – structurally; species</p>
<p>Intensification Factor</p>	<p>Trend to choose fewer, smaller or slower-growing trees (inc. food trees)</p> <p>Affordable or denser housing may have the least plantable space AND the least disposable income or investment</p>	
<p>Supply and Demand</p>	<p>Not enough caliper stock available; caliper tree takes years to produce</p> <p>e.g. Toronto 40% target canopy cover by 2057 up from ~ 27% now</p> <p>113,000 60mm caliper trees per year (City)</p> <p>460,000 trees per year (everyone else)</p> <p>.....and every other City in North America</p>	
<p>MAINTENANCE</p>	<p>All extra trees planted will need additional budget to establish and MAINTAIN BETTER (Urban Forest Strategy 2014).</p> <p>Theory: every dollar re-assigned to maintenance should achieve better than a dollar saved in future tree planting, due to better survival and growth</p> <p>Planting fewer SMTEs than is required? May not be a bad model so long as money saved goes towards timely maintenance.</p>	

WHO IS GOING TO PLANT, WHERE?

- 9,955 ha of UGB is theoretically plantable
- To achieve 34% canopy cover by 2065, need to have new tree canopy cover over 2,431 ha inside UGB i.e. ~ 25% of ALL plantable space (2,431 out of 9,955) under new tree canopy by 2065

HOW MUCH MORE SHOULD THE CITY DO?

- The City owns 11% of UGB landbase
- City-owned already has 41.7% canopy cover – good enough?

IF THE CITY COMMITTED TO 25% OF THE TARGET (AN ADDITIONAL 600 HA OF A TOTAL 2,431 HA) COULD IT DO IT?

- 1300 ha of City-owned land is theoretically “plantable”
- BUT about half is sports fields, pipeline/Hydro easements, future ‘shovel-ready’ inventory, non-tree ecosystems, etc. – not plantable
- “Highest and best use” - need to consider tree canopy target; afforest vacant land

50% of ALL the plantable space the City owns (25% of City-owned UGB) under new tree canopy cover by 2065

42% + 25% = 67% “The Forest City”

25% : 8,900 more SMTEs yearly, 2017 onwards

AND

Incent Everyone Else....?

- 89% of UGB is in Everyone Else’s hands
- Take on 75% or 90% or more of the tree canopy cover target?
- Plant 36,325 or 40,500 or more SMTEs annually? (incent with \$\$/SMTE)

Budget: 2017 – 2019 INCLUSIVE \$1.8 MILLION (\$600,000/YEAR)