

# City of Edmonton Urban Forestry

Edmonton

## Structural Pruning

Patricc Robinson  
patricc.robinson@edmonton.ca  
edmonton.ca/[urbanforestry](https://www.edmonton.ca/urbanforestry)

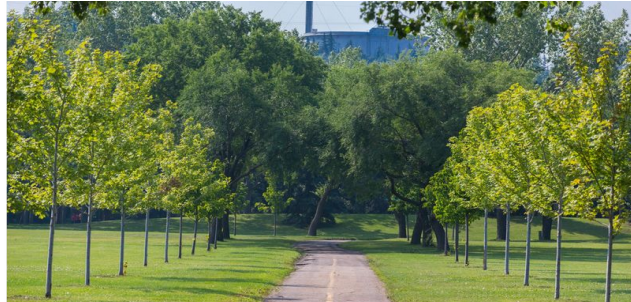
# Urban Forest Asset Categories



*Boulevard Trees*



*Naturalized Site*



*Open Space Trees*



*Natural Area*

# The Purpose of Structural Pruning



Structural pruning selectively favors a single, dominant leader by suppressing competing leaders using reduction cuts. Structural pruning in the landscape aims to develop the strong tree structure we see in the forest.

# We Are Trying to Emulate Nature

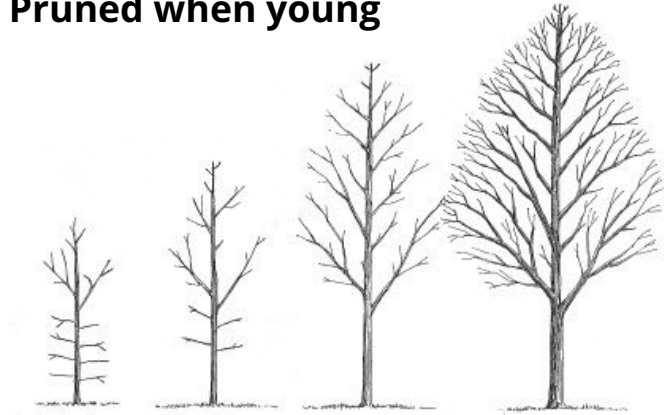


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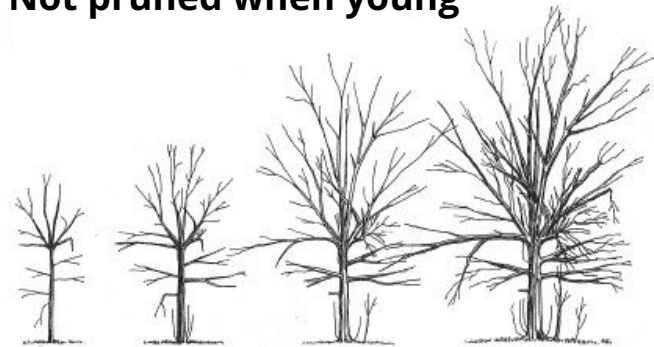


# Purpose of Structural Pruning

## Pruned when young



## Not pruned when young



<https://www.inlandarbor.com/services/structural-pruning/>

## Helps to avoid



## Structural failures

Joseph OBrien, USDA  
Forest Service,  
Bugwood.org



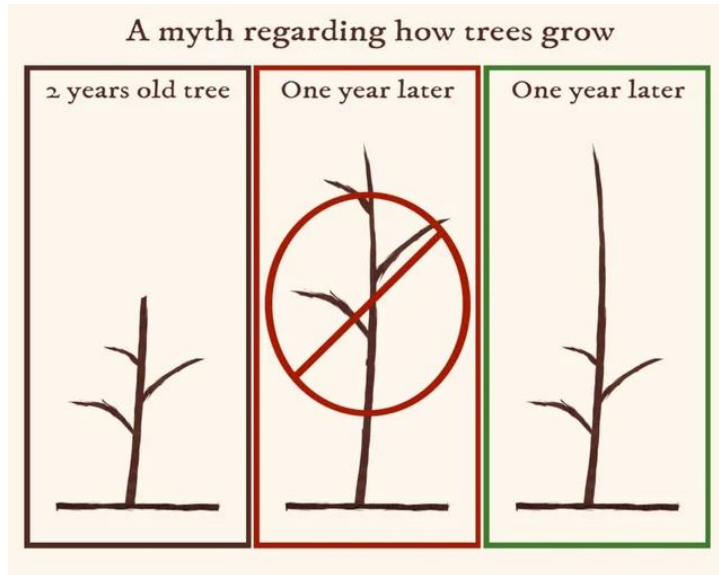
## Large pruning cuts

Todd Watson, Texas A&M University, Bugwood.org

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# Tree Growth

Trees grow from the tips of each shoot



[https://www.reddit.com/r/biology/comments/12blte9/a\\_myth\\_regarding\\_how\\_trees\\_grow/](https://www.reddit.com/r/biology/comments/12blte9/a_myth_regarding_how_trees_grow/)

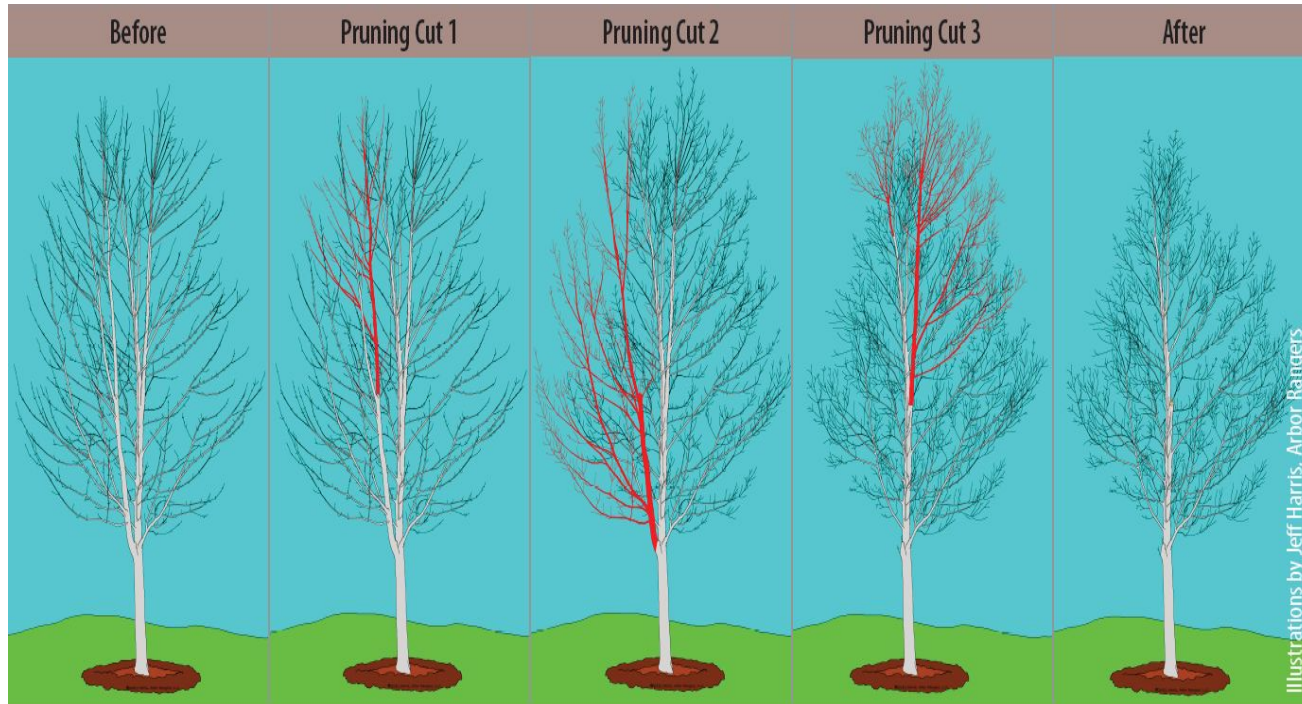


[https://www.tripadvisor.ca/Attraction\\_Review-g58805-d5926729-Reviews-Old\\_Bicycle\\_in\\_the\\_Tree-Vashon\\_Washington.html](https://www.tripadvisor.ca/Attraction_Review-g58805-d5926729-Reviews-Old_Bicycle_in_the_Tree-Vashon_Washington.html)

# Tree Growth

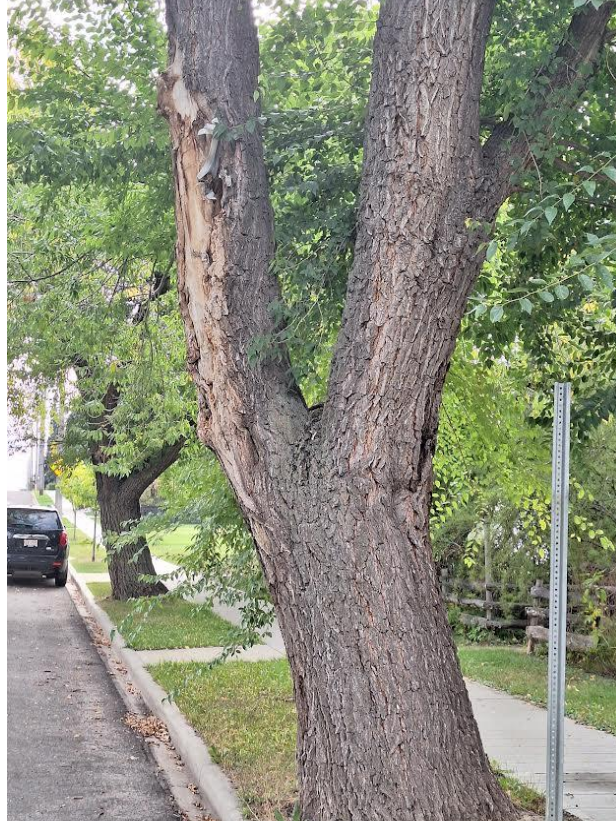


# Developing a Central Stem



<https://marinmg.ucanr.edu/CARE/HOWTOPRUNE/Cuts/>

# Height of First Union



## High First Union



# Height of First Union



# Codominant Stems



**Elms w. poor structure (codominant stems)**



**Elm w. good structure**

# Aspect Ratio



Aspect ratio at pruning was about 0.8; the union is weak. (4 photos courtesy Brian Kempf)



Aspect ratio one year later was about 0.5, making the union stronger.

<https://hort.ifas.ufl.edu/woody/aspectratiochanges.shtml>

# Aspect Ratio



Aspect ratio on this 14-inch diameter tree was about 0.8 when the tree was first pruned (above photo). This means that the branch on the left side of the tree was about eight tenths the diameter of the main stem on the right side. Aspect ratio was much smaller (0.6) 11 years later making the union much stronger (right photo). Photo credits: John Lichter



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## First Union



**Proper first union**



**Improper - too low**

# Trunk Taper



## No Over-Lifting

**Definition:** A common malpractice on pruning a large tree or when performing crown raising is removing many or all interior low branches, giving rise to a situation known as over-lifting.

**Why Not:**

- Interior branches also provide food source needed by the tree to carry on normal defense and other functions.
- Health of the tree can be adversely affected with removal of excessive live tissues.
- A poor tree form with low live crown ratio is created.
- The tree will become more prone to failure.



# Temporary Branches & Subordination



# Subordination



# Pruning Dose



**Before**



**After**

# Pruning Example



**Before**



**After**

# Summary

- The objective is to prune with the intention of forming the future main stem. The central leader will become the central stem.
- The canopy of the tree does not raise as the tree grows.
- On boulevard trees, such as ash, elm and oak, we are looking to create a main stem with the first union at 12-14 feet.
  - ◆ Having the first union at this height means all branches below 12-14 feet on a young tree are temporary.
- Temporary limbs will have to be removed at some point. This means that it is important to reduce larger limbs so their eventual removal in the future is possible and does not negatively impact the health of the tree.
  - ◆ When subordinating limbs there should be a reduction in length of nearly 50%.
  - ◆ In each pruning cycle, the arborist should selectively remove temporary limbs.
- City trees are pruned on a 5 year cycle. Young healthy trees will grow quite a bit in that time; pruning should take into consideration how to leave a suitable tree so the next pruner can appropriately prune for structure.
- According to ISA guidelines a tree can handle removal of 25% of its canopy. This is a general rule; a young healthy tree can tolerate an even larger amount of live growth removal with appropriate pruning practices.

# Thank You

Patricc Robinson  
patricc.robinson@edmonton.ca  
edmonton.ca/**urbanforestry**

The logo for the City of Edmonton, featuring the word "Edmonton" in white text on a blue square background.

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