



## Tree Species Selection: What to Consider

Appropriate tree species are contingent upon a number of factors.

### Above:

- people – typically 8' clearance minimum
- vehicles – typically 14' clearance minimum
- light standards – where trees and lights are close together, you can use a shorter light standard height so it is below the canopy of a tall tree, typically no closer than 15'
- signs – street signs, traffic signs, traffic light and business signs, typically no closer than 15'
- buildings – width of sidewalk is important as that limits crown spread or increases conflict
- fire hydrant, driveways and intersections – typically no closer than 15'

### Below:

- size of root area – planting pit, typically 4'x4', is insufficient for stability and for health, consider connected root zones between pits, Silva Cells or similar products
- traffic over root area – metal grates need inner rings removed as tree grows; mulch gets kicked around; poured-in-place rubber not as long-lived as hoped; permeable pavement pores tend to clog up with dirt over time; consider brick pavers with some space between them, or other types of pavers that protect but also permit precipitation to infiltrate – may need resetting to reduce trip hazards
- soil in root area – not fill and debris, use of structural soils may be appropriate, soil specifications should be established and enforced: [www.urbantree.org](http://www.urbantree.org)

### Tree longevity:

- The average life span of a street tree varies, but it is typically shorter than trees in open spaces or more natural settings. For street trees, longevity depends on a number of factors including the species, available soil volume, and care (water, pruning, etc.). And trees planted in *downtown* urban areas do not live even as long as trees planted in residential areas, mainly due to harsher and more limited growing conditions (planting pits, high temperatures and reflected heat, drought).
- The costs of repeatedly purchasing, planting and removing trees in highly urban locations must be weighed against the one-time investment of providing suitable root space and maintenance.
- Trees that must be removed after a relatively short period of time never create the appearance often desired by the community. And the trees never ever make the substantial environmental contribution of a mature and healthy tree to air quality, air cooling from shade, carbon storage or stormwater management – all things that make an economic contribution to the community.
- A small maturing tree will generally not outlive or out-contribute a large maturing healthy tree.
- A large maturing tree is unlikely to make it to maturity in most urban areas.

### Species selection:

- Native species: NC has a broad selection of tree species but not all of them are suitable for all growing situations. Trees in downtown and urban sites must be able to withstand the heat and drought and poor soils that typically exist in these locations. They also should have natural branching habits that are suitable for the location and have limited fruit or nut production that could create a nuisance. While there are some native species that could withstand stressful urban sites, native species can definitely be considered for other locations within a community.
- Non-native species: Selecting tree species that meet the needs of downtown and urban sites means considering non-native species. Drought and soil tolerances, crown shape and size and height should all be considered, as well as invasiveness.

**Species crown size:**

- For busy or narrow sidewalks a tree should have a narrow crown, at least when young or if a small maturing tree.
- Trees with names including fastigate, skyline or rocket tend to have narrow crowns. Trees with such crowns also tend to have a more formal appearance, not spreading or relaxed. Using such trees may mean that, where more crown space exists, choosing to plant more spreading trees, so that the formal impact is softened as one looks down the streetscape.

**Species height:**

Planting a small tree in a large growing space is a waste of that space and the contributions a larger tree could make. Planting a large tree in a small or inadequate space is a waste of money as that tree will either be repeatedly pruned to control it or have to be removed long before its life span is done, due to site conflicts.

- Small maturing trees (to 20-30') typically grow as wide as they are tall. This means that not all small trees are suitable for urban planting, even if they are tough, as their growth habit will place them in direct conflict with pedestrians, buildings, business signs and vehicles requiring long term conflict management. Some small trees are understory trees, which means that they grow best in light to heavy shade.
- Medium maturing trees (30-50') can seem quite large when planted in urban areas without multi-story buildings but provide the shade and aesthetic impact that is appealing to tourists and to people parking their cars on the street. But that is only where there is enough water, soil and root protection as well as good pruning practices.
- Large maturing trees (>50') are wonderful but they need space above and below. Planting them in urban areas requires significant planning and investment in the below ground growing space, so that the tree can have the root area and access to water that it needs.

**Rate of growth:**

- Trees that are "fast growing" tend to have more brittle wood and more root conflicts and do not withstand decay due to physical damage as well. This can be a particular concern for large maturing trees. Fast growing trees are typically shorter-lived under natural growing conditions.
- Trees that are "slow growing" take longer to reach their mature size but also tend to have stronger wood, better decay resistance and are slower to develop root conflicts. Slow growing trees are typically longer-lived under natural growing conditions.
- Regardless of growth rate, improper pruning and topping trees will increase maintenance costs and increase the presence and spread of decay, and increase stress, which all can lead to early removal.

**Strategies:**

While having a single species line a city block is a common design practice that can be very attractive, some other considerations can make alternating species desirable:

- reduce exposure to large scale problems – having a variety of species means that not all trees are equally susceptible to the same pests or diseases, or impacted by catastrophic weather events.
- alternating fast and slower maturing trees may be considered to speed up the visual impact of planting, with the expectation that the faster trees may need to be removed sooner and replaced with trees with more desirable characteristics after the slower trees are established.
- alternating small and large maturing trees may be considered to:
  - limit any one type of conflict – pedestrian vs business signage.
  - reduce amount of maintenance – small maturing trees can generally be pruned from the ground which is less expensive.
  - provide impression of continuous large tree cover when looking up or down the street.
  - reduce the visual impact when a tree (large or small) must be removed and replaced.