



STREET TREES & PLANTERS

Great cities have great street trees. Street trees contribute to the character of both residential and commercial streets. They provide shade and reduce heat in summer, offer visual interest in winter, and help manage stormwater.

Mature trees provide significant stormwater quantity and rate control benefits through soil storage, interception, and evapotranspiration. A tree with a 25-foot diameter canopy can hold the 1-inch, 24-hour storm event from 2,400 square feet of impervious surface. Interception and evapotranspiration also decrease runoff volume with larger trees providing exponentially more benefit than smaller trees.

Grand Rapids has a goal to achieve 40% tree canopy in the city.

USE

- Street trees should be included on every street, whenever possible. They are particularly important on residential, Neighborhood Business, Crosstown Connector, and Urban Center streets. Trees are required on all street projects unless an exception is allowed due to technical constraints or other site limitations.
- Trees are most important in the Parkway Zone and help to define the consistent edge of the street.
- Street trees are important in high pedestrian traffic areas and in high

impervious areas in order to provide a cooler micro-climate and more hospitable pedestrian environment. However, trees should be protected from substantial pedestrian traffic that may compact their roots.

- Street trees can be incorporated into the static zone of the street, particularly in vegetated green infrastructure facilities such as Curb Extension Bioretention, Linear Bioretention & Median Swales, or Stormwater Planters, as well as plaza spaces through the use of tree grates or landscape planters.
- Trees should not be placed in the clear vision area outlined in the City Ordinance or be placed in the corner clearance area that adversely impacts drivers and pedestrians visibility and sight distance.

DESIGN

- Trees should be selected from the city's approved tree species list¹¹. Larger street trees are strongly encouraged. Proper selection of tree species includes:
 - Size of growing area, soil, and drainage.
 - Width and height of the tree relative to the distance between trees and the distance between trees and adjacent structures (buildings, bridges).

¹¹ Grand Rapids Approved Tree Species List. <http://www.urbanforestproject.com/downloads/approvedtrees.pdf>

- Presence of other street elements that would adversely impact trees or be adversely impacted by trees, such as signs, street light and traffic signal poles, or overhead utilities.
 - Deep root structure to minimize impacts on underground utilities and sidewalk pavement.
 - Tree characteristics like seed pods, fruits, sap, and low branching are typically avoided.
 - Depth of the soil is based on the size of the root ball, with the top of the root ball flush with the finished grade of the planter (absent of mulch cover) and accounting for a 6 to 12 inches of compacted planting soil below the root ball. Do not place root ball directly on undisturbed grade. Provide at least 500 cubic feet of soil per tree. Preferred soil volumes are:
 - Small Tree: 600 cubic feet
 - Medium Tree: 1,000 cubic feet
 - Large Tree: 1,500 cubic feet
 - Multiple Trees: Provide a continuous tree trench at least 8-feet-wide by 3-feet-deep
 - For trees up to 3 inches in caliper, a minimum of 12 inches of new planting soil mix must surround the root ball (e.g. 2 foot diameter root ball requires a minimum 4 foot diameter area of planting soil). For trees 3 inches in caliper or larger, 18 inches of planting soil mix must surround the root ball.
 - Street Trees are typically located in one of three types of conditions:
 - Within open lawn or planting areas. Should be a minimum of 3-feet wide provided the proper volumes are provided.
 - Within a landscape planter of vegetated green infrastructure facility. A minimum of 4-feet wide subject to the soil volumes indicated below.
 - Within a tree grate or tree pit/trench. The grate structure and opening for the trunk may be smaller than the total soil volume and growing area, which should be sized to the soil volumes indicated below.
 - Street tree types are generally consistent along a block length or along the entire street, however there are also benefits to featuring a diverse range of street tree types.¹²
- Street trees are an important component of green infrastructure. As part of the tree design, explore opportunities for using structural soils below existing paved areas when they can be connected to the growing zone of tree roots.
- Tree branches should be trimmed to seven feet above the sidewalk to provide a clear walking space for pedestrians. Trees may need to be trimmed even higher where street signs are present.
 - Trees require adequate water and drainage. Trees must be regularly watered, especially during the first two years after planting. Raised planters may be needed where there are seasonal water flows or snow melt.

¹² Grand Rapids 2012 Street Tree Planting Plan. <http://grcity.us/parks/Pages/Tree-Planting.aspx>



OPERATIONS AND MAINTENANCE

- Trees require routine maintenance including tree trimming and health assessments by the City. The City of Grand Rapids Forestry division provides numerous tree services not limited to: emergency response for tree-related emergencies; pruning; removal of diseased, dead, and dying trees; and administering a tree planting and maintenance program.
- Planted street trees should have a two-year warranty period, including a maintenance contract providing tree care for the first two years following installation.
- At least 20-gallons of water should be provided to each tree immediately following planting. Information on watering, weeding, mulching, and uncompacting soil for street tree care is at: <http://grcity.us/parks/Pages/Caring-For-Your-Street-Tree.aspx>.

SPECIAL CONSIDERATIONS

- Avoid placing street trees near major utilities, utility leads, vaults, access panels, or other utility infrastructure that are within the soil growth zone.
- Preserve trees on slopes and riverbanks to prevent soil erosion.
- Seek advice from a professional on the health of each tree and the effects of planned construction. Determine what procedures should be followed to protect the trees. Identify trees to be protected and preserved during the site planning process (i.e., greater than 4 inches in diameter per City standard).
- Hybrid designs containing part open landscape planters and part covered tree trenches may be utilized with special approval.
- Consider the provision of water connection spigots in close proximity to tree planting areas.
- Do not store any equipment or materials within the drip line of a tree.



REFERENCES

- NACTO: Urban Street Design Guide, 2013
- Street Design Elements: Sidewalks; Street Trees <http://nacto.org/publication/urban-street-design-guide/street-design-elements/sidewalks/>
- AASHTO: Guide for the Planning, Design, and Operation of Pedestrian Facilities, 2004, Section 3.2.13: Ambience, Shade, and Other Sidewalk Enhancements
- AASHTO: A Policy on Geometric Design of Highways and Streets (Green Book), 2011 Section 5.3.11: Landscaping
- City of Grand Rapids Street Classification Policy, 1996 Section 11. Plants
- Grand Rapids 2012 Street Tree Planting Plan. <http://grcity.us/parks/Pages/Tree-Planting.aspx>
- Grand Rapids Zoning Code. http://grcity.us/design-and-development-services/Planning-Department/Documents/ZONING_ORDINANCE_Last_Amended_12-15-15_WEB_LINKS.pdf
- Grand Rapids Zoning Ordinance. Reference ordinances for new development as follows:
 - Minimum number and size of trees planted in common space.
 - Overlay district tree planting requirements.
 - Landscaping requirements (prohibited trees).
 - Tree protection/replacement requirements.
 - Street tree planting requirements.
- Johnson, G. R. 2013. Protecting Trees from Construction Damage: A Homeowner's Guide. University of Minnesota Extension. Last Accessed: March 24, 2015
 - <http://www.extension.umn.edu/garden/yard-garden/trees-shrubs/protecting-trees-from-construction-damage/>