

## Street Trees



### Application

- Collector Streets
- Local Streets
- Pedestrian & Trails

### Advantages

- Peak flow reduction
- Reduce Urban Heat Islands
- Improved air quality

### Limitations

- Not suitable in areas with high pollutant levels
- Must be designed to avoid conflicts with sight distance requirements
- May not be feasible with steep slopes

## DESCRIPTION

Street trees can be utilized within roadway right-of-ways to reduce reduce stormwater runoff and reduce heat island effects. Street trees can be placed in parkway lawn areas in rural and suburban areas. When space is limited, urban street trees can be placed in tree trenches or planters. Street trees provide a reduction in peak flow by capturing some rainfall in the canopy and slowing down rain as it falls to the surface, promoting infiltration and uptake of stormwater in the root system and ultimately promoting evapotranspiration. Street trees can provide air quality benefits by filtering air pollutants, cooling of city streets reducing heat island effects and providing benefits to the community by protecting biodiversity and improving community aesthetics.

## CONDITIONS WHERE PRACTICE APPLIES

### *Application*

Trees can be provided in all roadway and pedestrian classes, however this section focuses on the use of trees as “street trees” which are within 10-feet from the pavement edge. These street trees can be applied to:

- Collector Streets
- Local Streets
- Pedestrian & Trails

### *Site Constraints*

- Review underlying soil conditions for potential contamination, infiltration rates and seasonal groundwater elevations.
- Provide adequate soil volume and material for healthy tree growth.
- Consider underdrains in compacted and heavy clay soils.
- Check for overhead utilities and only consider small trees in these locations (when applicable).
- Identify underground utilities and provide proper setbacks in coordination with the utility provider.
- Check with governing agency of roadways for proper sight distance setback and of trees from intersections, roundabouts and driveway.
- Review existing trees in the surrounding area and introduce new tree species to provide diversity in the area and to avoid localized devastation from species-specific issues (i.e. Emerald Ash Borer).
- Avoid trees with shallow roots or aggressive root systems near sidewalks and pavements.
- Utilize salt-tolerant tree species along roadways which use salt or other de-icing agents for winter storms.



### Site Suitability Considerations for Street Trees

Tree Spacing	20- to 40-feet (see local codes)
Utility Buffer	10-foot min., (confirm w/ utility provider)
Sight Clear Distance	12-foot min., (see local codes)

### Green Infrastructure Benefits

GI PRACTICE	EFFECTIVENESS
Peak Flow Attenuation	3/5
Infiltration	3/5
Filtration	4/5
Air Quality	5/5
Community Aesthetics	5/5
Heat Island Effect	5/5

### Green Infrastructure Fact Sheet

## VARIATIONS AND ENHANCEMENTS

Street trees can be very adaptable to urban situations if provided the proper infrastructure to support healthy growth.

### *Tree Trench*

- A continuous excavated trench backfilled with structural soil (high void ratio stone and soil mix) or modular suspended pavement stormwater system (i.e. Silva Cell) which promotes root growth and stormwater conveyance through the trench. Unless infiltration is anticipated by the engineer, an underdrain should be installed and connected to the local municipal stormwater system.

### *Tree Grates & Guards*

- A metal grate used to protect the root system in heavily trafficked urban pedestrian areas. The grates are typically 4-foot by 8-foot, but various sizes are available. Check with the local municipality for any standards. Metal tree guards can also be used to protect the trunk of the tree in busy urban areas.

## SIZING AND DESIGN CONSIDERATIONS

Various factors should be considered during the design and selection of trees for a roadway project. Final designs should be based on site-specific considerations and limitations and designed by a licensed landscape architect.

- Trees should be optimally planted every 20- to 40-feet along the roadway. Tree spacing should be 10% less than the mature spread of the tree create an interconnected canopy. Review sight distance setbacks of trees from intersections, roundabouts and driveways.
- Specify quality and well-formed nursery stock with a strong single leader. Trees should be balled and burlapped and installed at a minimum 2-inch caliper size. Refer to "American Standards for Nursery Stock (ANSI Z60.1)".
- Utilize native and nativar hardwood tree species when possible. Native trees have developed climate resilience to the area and benefit local wildlife.
- Consider seasonal interest (spring flowers, fall color, etc.) in selecting species.
- Promote a diversity of tree species throughout the area and within a project. In projects with many trees, no species should consist of more than 25% of the proposed trees.
- Confirm salt and de-icing practices of the roadway and choose salt-tolerant species as needed.

- Select tree species with lower branches that can be limbed up to 12- to 14-feet above grade where visibility is important.
- Depending on available planting area and other considerations, trees are grouped into small, medium and large to provide the best tree for the space. Refer to recommended Street Tree Species list based on site and soil conditions.

### Tree Selection

	Tree Height (max)	Planter Width (min.)	Soil Volume (min.)
Small Tree	15-foot	4-foot	300 c.f.
Medium Tree	35-foot	6-foot	600 c.f.
Large Tree	40+-foot	8-foot	1,000 c.f.

## INSPECTION AND MAINTENANCE

Monitoring and maintenance of street trees is critical for the initial 2-3 years following planting. Trees should be warrantied for a period of 12-months from planting acceptance. Review the condition of the trees with the installer/provider at the 10-month mark to verify the health and condition of the trees and determine if any replacements are needed.

At a minimum, routine maintenance activities of street trees should include:

- Monthly monitoring the condition of the tree and prune any dead or broken limbs (do not prune to shape plants). Potentially hazardous tree structures should be addressed immediately.
- Provide watering bags for trees during hot, drought months as needed. Tree bags are designed for a slow release of water to the trees roots. Water bags should be filled at minimum once per week.
- Topdress mulch on an annual basis to a depth of 3-inches. Mulch should be shredded hardwood bark mulch free from debris, stone or seeds from other plant materials.
- Tree staking should only be used on extremely windy sites in the initial year of establishment. Tree staking practices should be reviewed with the local governing agencies standards.
- Remove leaves in fall as needed, based on site conditions. Mulching leaves during fall mowing improves soil nutrients and should be used when possible.