

Planting Trees in Highway Rights-of-Way

Description Larger highways often have fairly large parcels of unused land in the form of cloverleaves and diamonds near interchanges, median strips, and buffers. These rights-of-way can be ideal locations for reforestation because they generally serve no other purpose.

Planting trees along highways can reduce air pollution and stormwater runoff, provide habitat for wildlife such as birds, reduce air temperatures, stabilize the soil, provide a visual screen and buffer from noise and highway fumes, and create a visually pleasing environment for the highway driver.

- Pre-Planting Considerations***
- Do highway planting guidelines prohibit or restrict trees?
 - How do I address potential conflicts between trees and utilities?
 - Do I need to use different methods for planting trees on steep slopes?
 - How do I address potential damage to trees from deer?
 - How do I provide unobstructed vehicle recovery areas, clear lines of sight, safe travel surfaces, and access to maintenance structures?
 - Can I make the area more attractive with plantings?
 - How do I address soil conditions such as severe compaction or fill soils?
 - How do I manage invasive plants?
 - How do I address illegal dumping?
 - How do I address exposure of trees to auto emissions, polluted runoff, wind, and drought?
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Species Selection Selecting appropriate tree species is key because it can address most site conditions and is often more efficient than trying to change the site characteristics. Select a diverse mix of hardy, native species that are adapted to soils and site conditions.

Other desirable species characteristics include the following:

- Tolerates urban stormwater pollutants (oil and grease, metals, chloride)
 - Tolerates air pollution
 - Tolerates poor, highly compacted soils
 - Tolerates drought (rainfall may be the only source of water)
 - Tolerates inundation (if used for stormwater treatment)
 - Provides food, cover, or nesting sites for wildlife
 - Has fall color, spring flowers, or other esthetic benefit.
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- Site Preparation*
- Clean up trash and rubble
 - Remove invasive plants such as Tree of Heaven (may involve mowing, cutting, and stump treatment)
 - Improve soil drainage if needed (e.g., amend with compost, mix soils to a depth of 6 to 18 inches).

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- General Planting Guidance*
- Plant trees in groups to provide shared rooting space and allow mowing around trees to control invasive species
 - Use groupings of species that provide fall color, flowers, evergreen leaves, and varying heights to create an esthetically pleasing landscape
 - Provide gradual transitions between cover types (e.g., soft edges) to benefit wildlife
 - Provide setbacks of 17-50 feet between tree planting areas and edge of pavement to reduce limb and leaf fall onto the roadway (Figure 26), prevent trees from falling into the road, allow for vehicle recovery in high speed areas, and prevent icy spots on shaded roadways (Metro, 2002; MD SHA, 2000; NC DOT, no date). Consider ultimate road widening when determining setbacks. Consider planting wildflowers within setback zones.
 - Seedlings may be preferable to large nursery stock since they will be watered infrequently (Gilman, 1997)
 - Maintain clear line of sight within 25 feet of overhead lights, within 500-1,000 feet of large signs and traffic control devices, and in the area between 2 to 6 feet above roadway elevations. Maintain vertical clearance of 16 feet above roadways (MD SHA, 2000).
 - Provide a setback of 5 to 17 feet to allow maintenance access to roadside structures, such as traffic barriers, cabinet devices, noise walls, drainage structures, and utility poles (MD SHA, 2000).
 - When planting on slopes, create small earthen berms around trees to help retain moisture. For very steep slopes, use terraces, bioengineering, or consider alternatives to tree planting.
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***Specific
Planting
Guidance***

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| Highway Cloverleaves | Provide a setback of 30 to 50 feet between tree planting areas and the edge of pavement, and plant trees or allow natural regeneration in the center of the cloverleaf. The setback ensures adequate sight lines, allows for vehicle recovery and prevents tree branches in roadways (NC DOT, no date). |
| Highway Buffers | Provide a setback between tree planting areas and the edge of pavement of 20-50 feet for flat areas (or slopes of 3:1 or less) and 17 feet for slopes of 3:1 or steeper (MD SHA, 2000). This setback generally restricts trees in the area between the edge of the pavement and the toe of the slope (swale) to allow adequate sight lines and vehicle recovery and to prevent tree branches in roadways. Create a gradual transition from grasses to trees on cut slopes. |
| Highway Medians | Medians greater than 25 feet wide can support two rows of trees spaced 20-40 feet apart (GFC, 2002). Provide adequate setbacks to keep utilities clear (if present) and to prevent downed trees or limbs in the roadway. Consider planting large shrubs in median strips if utilities are an issue or if space is limited. |

Maintenance

- Plan for minimal maintenance of trees (watering may not be feasible)
 - Use mulch to retain moisture. Do not mulch deeper than 3 inches or build up mulch around trunks.
 - Mow setback zones and remove any fallen trees or limbs
 - Manage height of volunteer trees to prevent falling during storms
 - Monitor and control invasive species
 - Use integrated pest management to control insects.
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Potential for Stormwater Treatment

Trees planted in highway cloverleaves, medians, and buffers can be used to provide treatment of stormwater runoff, since these areas typically already receive polluted runoff from the highway. Cloverleaves are generally large enough to locate most stormwater treatment practices, while median strips and buffers lend themselves to the use of more linear practices such as bioretention, filter strips and swales. Ideas for integrating trees and stormwater treatment in these areas are provided below.

Highway Cloverleaves Trees can be planted on side slopes and islands in a wooded stormwater wetland (see Part 2 of this manual series for wooded wetland design) constructed in the center of the cloverleaf. Trees should be restricted on embankments, maintenance access areas, and setback zones.

Highway Medians Trees can be incorporated into swales within highway medians by using tree mounds as check dams (see Part 2 for tree check dam design) or planting trees on side slopes (provided they are not within the setback zone).

Highway Buffers Trees can be incorporated into a filter strip on flat areas or fill slopes along a highway buffer. The filter strip can either be forested or incorporate multiple vegetative zones that provide a gradual transition from grass to trees.

Further Resources

Maryland State Highway Administration (MDSHA). 2000. Woody Vegetation Management Standards. In *Integrated Vegetation Management Manual for Maryland Highways*.
Online: www.sha.state.md.us

Maryland State Highway Administration (MDSHA) Partnership Planting Program. Contact: Mr. Leroy Jonas, MD SHA Landscape Operations Division C-304, 707 N. Calvert Street, Baltimore, MD 21202.
Online: www.sha.state.md.us/ImprovingOurCommunity/oed/partner.asp

North Carolina Department of Transportation (NCDOT) Division of Highways. *Guidelines for Planting within Highway Right-of-Way*. Raleigh, NC.
Online: www.doh.dot.state.nc.us/operations/dp_chief_eng/roadside/design/PlantingGuid/pdf/PlantingGuidelines.pdf.

Cloverleaves and diamonds near interchanges are ideal for reforestation

Gradual transition from herbaceous vegetation to trees benefits wildlife and maintains clear sight lines



Setbacks between planting areas and pavement reduces limb fall onto roadways

This fact sheet was excerpted from:

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