

GREEN from the Ground Up

Nature-friendly design practices for land-savvy developers

Capitalize
on your
natural
assets



This fact sheet is one of a series on nature-friendly development practices created by Metro through its Nature in Neighborhoods initiative.

Nature-friendly development practices minimize the impact of development on natural resources, and can help developers save money and add value to their properties.

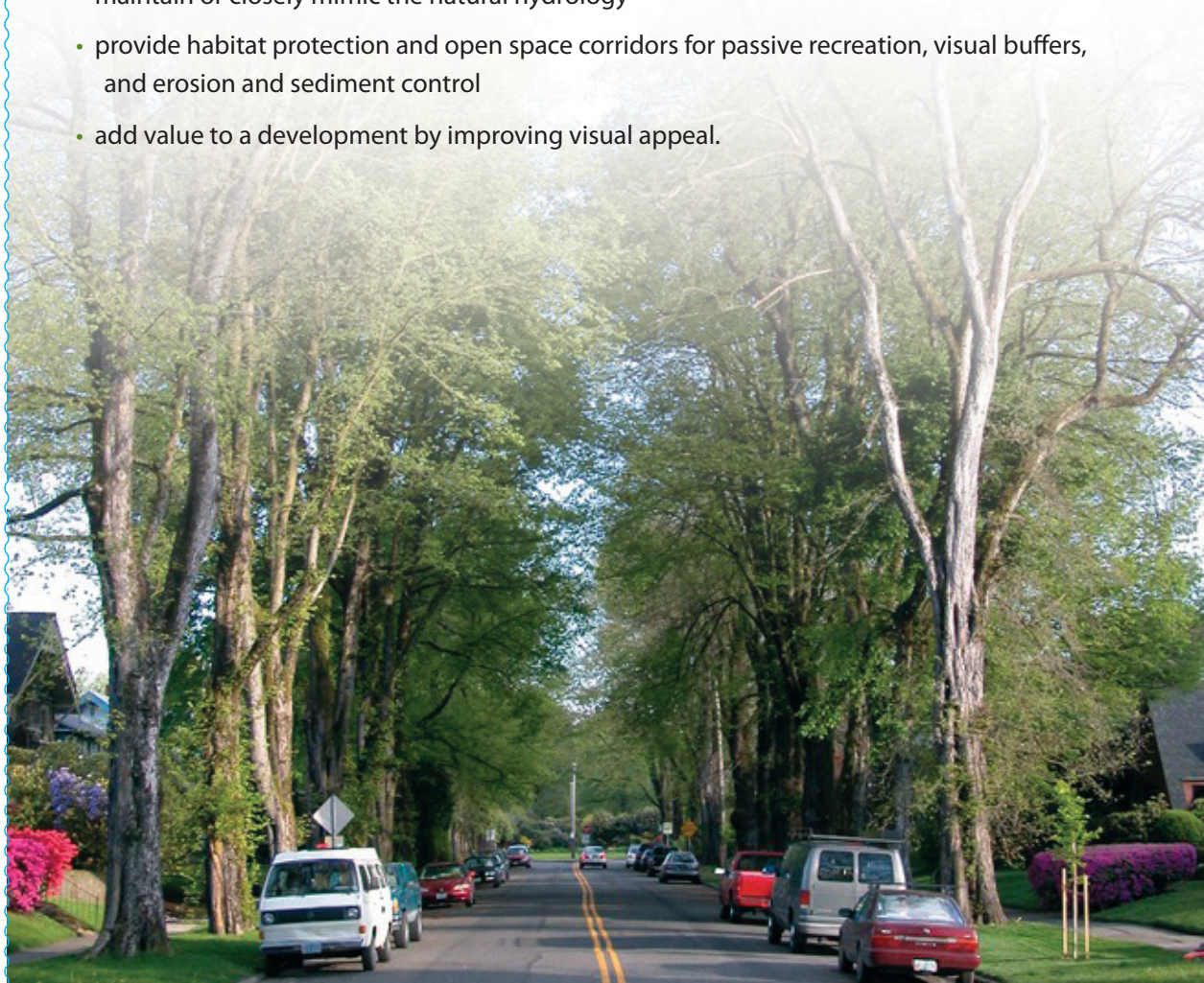
Metro's Nature in Neighborhoods initiative is a long-term effort to conserve and restore nature throughout the urban area and ensure that every citizen in the region has access to nature.

Tree planting and retaining vegetation

Description of practice

Planting and retaining native vegetation and soil are the most cost-effective and efficient tools for managing stormwater quantity and quality. Doing so also maintains watershed hydrology and promotes healthy aquatic systems. Riparian, or streamside, areas are the highest priority for retention. Other priorities include maintaining or creating vegetated areas that are part of a contiguous corridor or a larger habitat area. Planting trees and retaining native vegetation and soil are key elements to low impact development because these actions:

- mitigate the effects of impervious cover
- provide infiltration for runoff generated in developed areas
- maintain or closely mimic the natural hydrology
- provide habitat protection and open space corridors for passive recreation, visual buffers, and erosion and sediment control
- add value to a development by improving visual appeal.





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Retaining Vegetation

It is critical to protect vegetation and soil during construction so that they can continue to function as intended after construction. Some of the pitfalls to avoid during construction include:

- soil compaction, which is the leading cause of the death or decline of mature trees in developed areas
- removal of roots from trenching, foundation construction and other grade changes
- addition of fill material that can compact in-situ soil, reduce oxygen levels or change soil chemistry
- damage to trunks or branches from construction equipment or activities
- exposure of forest interior areas as land is cleared
- changes in surface and subsurface water flow patterns.

To minimize detrimental impacts to existing vegetation intended to remain on-site, meet and walk the property with equipment operators to clarify construction boundaries and limits of disturbance. Strategies that help avoid impacts during construction include mapping areas to be retained on site plans and delineating them on the site with fencing. Fencing should extend a minimum of three feet beyond existing tree canopy and stand at least three feet high. Installing signs to identify and explain the use and management of the protected areas can help ensure an understanding by the construction team. Of all the natural features to be protected during construction, wetlands, riparian areas and other drainages are most important.

Strategies to minimize detrimental impacts to trees and tree root systems include:

- minimizing soil compaction by protecting critical tree root zones
- limiting to an absolute minimum any excavation or trenching within the critical root zone
- prohibiting stockpiling or disposal of excavated or construction material in the vegetation retention areas
- constructing a retaining wall around trees to keep soil within the critical root zone at its current elevation if the grade level around a tree is to be raised
- cutting and stump grinding trees to be removed from existing treed areas (because root systems tend to tangle and fuse, this is the preferred method, as opposed to pushing trees over with heavy equipment)
- preventing wounds to tree trunks and limbs
- limiting to an absolute minimum the installation of impervious surfaces in critical root zones.



Detail of new residential development in Wilsonville that retains mature trees and soils.



Detail of residential development with preserved wildlife and stream corridors. Courtesy of OTAK

In some cases, retaining existing vegetation near newly built facilities is not desirable. Only trees that are free of major pest or pathological problems and those without crown damage should be selected for protection. Do not retain trees with weakly attached co-dominant trunks or if they are located in areas where failure could cause damage or safety problems.

It is best to have an arborist determine whether trees have relatively sound trunks and will be wind-firm post development. For example, trees and other native vegetation that developed in forests or woodlands are best retained in groups of sufficient size to maintain adequate growing space characteristics (soil moisture, sunlight, humidity, wind, competition from adjacent plants) and the integrity of the unit.

Trees identified as having significant wildlife value, such as snags and nesting sites should be retained regardless of the health of the tree, unless the tree poses an imminent safety threat as determined by a qualified arborist or urban forester.

Tree Planting

When selecting tree species to plant, begin with a site evaluation. Determine site specific conditions including soil conditions, microclimate and hydrology. Inventory the existing trees and note which species are in good health. Finally, choose species that suit the site conditions, achieve diversity and meet project goals. Conifers provide greater interception of rain, water storage and evaporation in the wet months and are recommended when ecologically compatible with the site.

Determine the desirable characteristics for new trees, depending on site conditions and project goals. Examples of characteristics may include:

- evergreen foliage and wide-spreading, dense canopies
- long-lived
- combination of fast growing species for immediate impact with slow growing species for longevity
- tolerance of summer drought and wet winters
- resistance to urban pollutants
- tolerance of poor or wet soils
- extensive root systems or deep roots
- interesting features such as attractive bark, foliage, berries or branching structure.

In general, a multi-layer canopy structure consisting of a combination of large trees, shrubs and groundcovers provides the most wildlife benefit. The ideal size for plant material depends

Benefits/value added

- Communities designed with open space and preserved mature vegetation are highly marketable and command higher lot prices
- Tree planting also increases property values and marketability
- Trees help prevent erosion, replenish moisture in soil and groundwater, intercept rainfall and absorb, filter and cleanse stormwater runoff from streets
- Trees prevent millions of gallons of polluted runoff from entering streams and rivers and prevent millions of gallons of rainwater from entering the sewage treatment plant
- Trees provide food and shelter for wildlife
- Trees provide shade and can keep homes and buildings up to 20 degrees cooler in the summer
- Trees provide privacy and help reduce noise and glare
- Trees and their sight, sound and smell help reduce stress
- Crime levels are reduced when there are extensive street tree systems and landscaped parks.



Retaining wall at Villebois development preserves soil elevation and allows mature trees to remain.



Sidewalk built around existing, mature trees on SE Yamhill Street in Gresham.

Green development adds value to your property and helps your bottom line grow





Example project: Oleson Woods Apartments

Photo courtesy of Carleton Hart Architecture



Oleson Woods is located off Oleson Road, in the Metzger-Progress area north of Tigard. The project developer is Community Partners for Affordable Housing.

Oleson Woods is a 32-unit affordable housing development that has maintained significant natural resources on-site. The housing units are grouped around a wetland that has been preserved and enhanced and continues to provide wildlife habitat. The new buildings are nestled into an existing tree canopy, with more than a dozen trees larger than two feet in diameter being preserved, providing both natural resource and aesthetic benefits. The forest and wetland help soak up and filter some of the stormwater runoff.

on several factors. In situations where invasive species are not a problem, weeds and browsing are controlled, and maintenance personnel are well trained, smaller starting plant material will have a lower mortality rate and is less expensive.

Where invasive species are prevalent and weed and browse control is not ensured, larger starting plant material will have a better chance of success. Larger plants will require additional watering during the establishment period. For larger tree stock, coniferous and broadleaf evergreen material should be a minimum of three feet in height and deciduous trees should have a minimum caliper size of one inch. Plants native to the region and grown under conditions similar to those on your site also have the best chance of success.

Appropriate site conditions: Planting and/or retaining vegetation is appropriate for all sites. Specific site conditions and project requirements will determine the type and distribution of protection areas as well as the mix of species to plant.

Cost compared to conventional development technique: Costs vary for each project and by site conditions. If planting areas also serve as stormwater management facilities, there may be no additional cost incurred. Planting trees also tends to increase property values.

Maintenance considerations: It is important to provide consistent maintenance of trees in the first three years after planting, including deep watering, mulching, weeding, erosion and sediment control, avoiding or minimizing herbicide application, and monitoring for signs of pests and disease. If vegetation areas also serve as stormwater management facilities, periodic removal of sediment or clearing of inlets and outlets may be necessary.

For more information

on nature friendly development practices or Metro's Nature in Neighborhoods initiative, visit www.oregonmetro.gov/nature, e-mail nature@oregonmetro.gov or call (503)797-1555.

References

1. Hinman, Curtis. January 2005. Low Impact Development: A Technical Guidance Manual for Puget Sound, Puget Sound Action Team, Washington State University Pierce County Extension, Washington.
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Clean air and clean water do not stop at city limits or county lines. Neither does the need for jobs, a thriving economy and good transportation choices for people and businesses in our region. Voters have asked Metro to help with the challenges that cross those lines and affect the 25 cities and three counties in the Portland metropolitan area.

A regional approach simply makes sense when it comes to protecting open space, caring for parks, planning for the best use of land, managing garbage disposal and increasing recycling. Metro oversees world-class facilities such as the Oregon Zoo, which contributes to conservation and education, and the Oregon Convention Center, which benefits the region's economy.

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Seminars for land-savvy developers

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