



SUBJECT Placement of Street Trees In Urban Areas Within the Clear Zone	FINAL NUMBER RD06-03(B)	EFFECTIVE DATE 9/6/2006	VALIDATION DATE	SUPERSEDES or RESCINDS NEW
WEB LINK(S) http://www.oregon.gov/ODOT/HWY/TECHSERV/				
TOPIC/PROGRAM Highway Design Manual	APPROVED SIGNATURE Original signed by Steven R. Lindland, P.E. Interim Roadway Engineering Section Manager			

PURPOSE

Project teams and designers need guidance on the inclusion and placement of roadside trees in projects. The Highway Design Manual (HDM) does not currently provide such guidance.

GUIDANCE

Roadside trees are allowed within the clear zone in urban, suburban or transition sections where the design speed is 45 mph or less, and intersection sight distance (ISD) is provided such that 50 percent of an AASHTO "P-vehicle" remains visible within the ISD triangle at all approaches when the tree reaches maturity. ISD shall be determined by a design professional on a case-by-case basis to ensure the 50 percent visibility requirement is met.

If the posted speed is 35 mph or less and there is a standard shoulder or on-street parking, the preferred location for street trees is in a planter strip between the curb and sidewalk. If the posted speed is greater than 35 mph, then street trees should be placed behind the sidewalk or at least 6 feet beyond the curb. If there is no physical delineation such as a curb, or if the design speed is greater than 45 mph, trees should only be placed beyond the clear zone recommended in the AASHTO Roadside Design Guide.

A minimum clear height of 10 feet from the pavement to the bottom of the branches must be provided. If the limbs overhang the roadway, a minimum clear height of 16 feet must be provided. In addition, the combined effect of many factors must be considered to determine if street trees are appropriate. These factors include access control, crash history, environmental value, clear zone guidelines, traffic calming, horizontal and vertical geometry, shy distance to tree, maintenance, utilities, and other roadway users.

ACTION REQUIRED

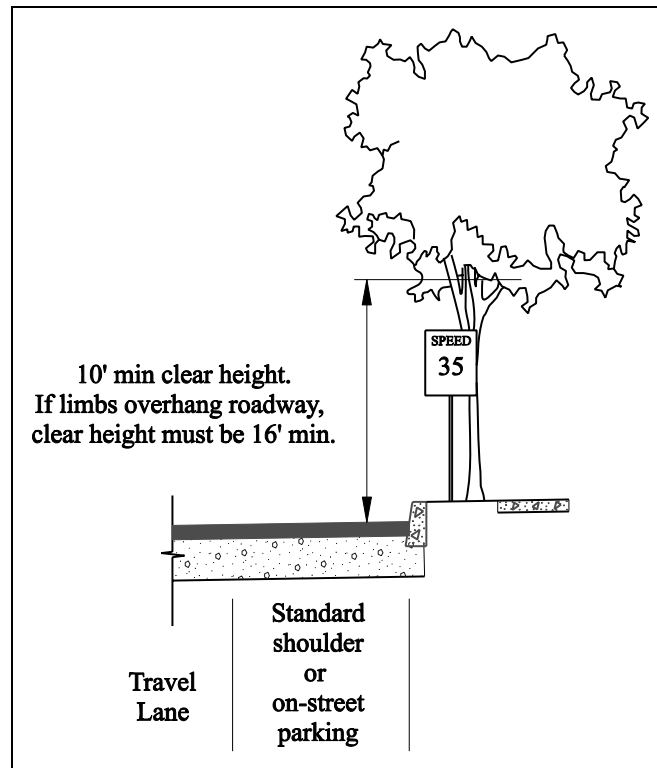
Section 5.4 of the HDM will be updated as follows:

- **Roadside Trees**

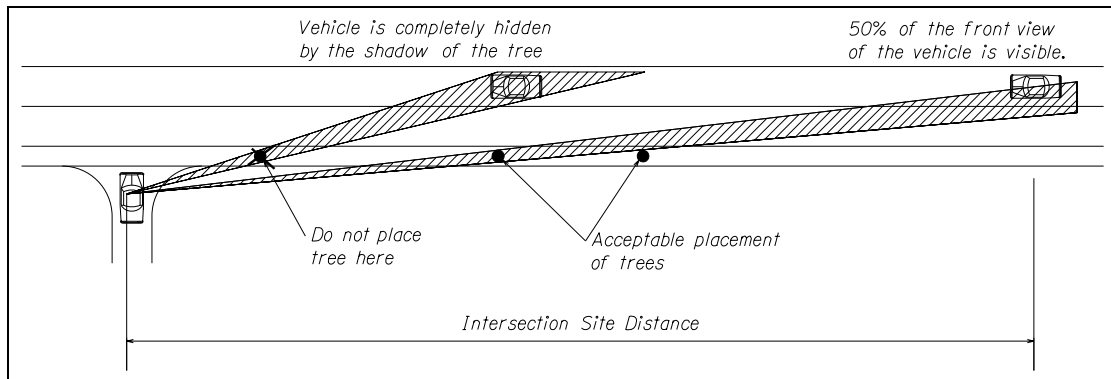
The following is intended to provide for the placement of street trees at the discretion of project teams where the criteria are met. If street trees are to be placed in a location where any of the criteria are not met, a design exception is required. (See Section 5.5 for the placement of trees in the median.)

Standard criteria to allow roadside trees:

- Design speed of 45 mph or less.
- Trees located behind a positive (physical) delineation, i.e. curb.
- The section is urban, suburban or a rural to suburban transition zone.
- Trees may be located in the planter strip between the curb and sidewalk where the posted speed is 35 mph or less and there is a standard shoulder or on-street parking.
- A minimum clear height of 10 feet from the pavement to the bottom of the branches. If the limbs overhang the roadway, a minimum clear height of 16 feet must be provided.



- If the shoulder is substandard, or if there is no on-street parking, trees should be located such that there is at least 6 feet from the edge of travel to the face of the tree at maturity.
- Where the posted speed is greater than 35 mph, trees should be located behind the sidewalk or at least 6 feet beyond the curb.
- If there is no positive delineation such as a curb, or if the design speed is greater than 45 mph, trees should only be located beyond the clear zone recommended in the AASHTO Roadside Design Guide.
- Trees may only be placed within the Intersection Sight Distance Triangle (ISD) such that at least 50 percent of an approaching AASHTO defined “P-vehicle” remains visible at all times and at all approaches when the tree reaches maturity. Fifty percent visibility is measured against what would otherwise be visible if there were no sight obstructions from trees, street furniture, utility poles, vertical curves, etc. For example, if 25 percent of the vehicle is hidden behind a vertical curve, street trees could only block an additional 25 percent of the vehicle. If 50 percent or more of the vehicle were hidden behind a vertical curve, it would not be appropriate to further reduce visibility by planting trees. The illustration below is only a sample of a shadow diagram. Because of the many variables, shadow diagrams must be drawn on a case-by-case basis. Note that ISD applies equally to all approaches and shall be determined by a design professional. Refer to the AASHTO “Green Book” for the procedure to determine ISD.



If the above criteria are met, then the combined effect of the following factors should be considered to determine if street trees are appropriate:

- **Access control** – When the number of approaches is reduced, a greater area is generally available for trees. If there are frequent approaches, it may not be possible to provide trees and at the same time provide adequate visibility at road approaches.
- **Crash history** – Trees should not be placed where there is a history of run-off-the-road accidents or a high potential for such accidents.
- **Environmental value** – Aesthetics, air quality, etc.
- **Clear zone guidelines** – Recognize that if trees are located within the clear zone recommended in the Roadside Design Guide, they pose a hazard to errant vehicles.

- **Traffic calming** – Tall trees may have a slowing effect on drivers as they provide a tall vertical element on the side of their field of vision.
- **Horizontal alignment** – Run-off-the-road accidents occur more frequently on curves. Trees should not be placed in high-crash locations.
- **Vertical alignment** – If visibility is already compromised due to a poor vertical alignment, street trees may compound the problem.
- **Shy distance to tree** – A minimum of 6 feet from the edge of travel to the face of the tree is desirable.
- **Signing** – Landscaping plans should show the location of all signs ensuring that trees do not interfere with visibility.
- **Other roadway uses** – Trees need to coexist with utilities, miscellaneous street furniture, etc.
- **Transportation system plans and city ordinances** – Roadside trees are often identified as desirable or required within cities or urban unincorporated areas.

If street trees are included in a project, an appropriate species needs to be selected taking into consideration the dimensions of the tree at maturity, the planter width required to support the root system, etc. Refer to the Roadside Development Manual for further information.

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