

LID ELEMENT #6: MINIMIZE SIZE OF CUL-DE-SACS

OBJECTIVE

Minimize the amount of impervious surface associated with cul-de-sacs.

CONSIDERATIONS

The City of Olympia has recently performed field-testing to determine the minimum acceptable cul-de-sac radius for adequate maneuverability of fire and solid waste vehicles. The information garnered from the field testing was used in preparation of this memorandum and development of potential options.

Current City regulations limit the use of cul-de-sacs to local access streets. In addition, subject to specific criteria City codes offer a “private access lane” (multi-private driveway) alternative to dead end streets. Such private access lanes require smaller turn-arounds and sometimes utilize pervious pavement. In general, cul-de-sac use in Olympia is limited. Given this limited allowance for cul-de-sac use, a further limitation on where cul-de-sacs may be constructed was not examined.

RELATED ELEMENTS

Element 4 Restrict Maximum Impervious Surface Coverage

TRADITIONAL APPROACH TO CUL-DE-SAC SIZE AND USE

Cul-de-sac size is controlled by the turning needs of fire trucks, buses, moving vans, solid waste trucks and similar large vehicles. It is important that in emergency situations fire trucks can maneuver without the need to back up. In addition, solid waste trucks need to be able to sufficiently maneuver within cul-de-sacs to operate and pick up solid waste containers.

“Dead end streets with excessive turn around area (particularly cul-de-sacs) can needlessly increase impervious area. In general, dead end or cul-de-sac streets should be discouraged; however, a number of alternatives are available where topography or other site specific conditions suggest this road design.”

Low Impact Development Technical Guidance Manual for Puget Sound (2012)

CODES AND STANDARDS REVIEWED

Engineering Design and Development Standards (EDDS) Chapter 4 and 9 and Standard Plan 4-5

City of Olympia Comprehensive Plan Transportation Section, December 2014

Olympia Municipal Code (OMC) Chapter 16.32

International Fire Code (IFC)

BENEFITS OF REDUCING IMPERVIOUS SURFACES ASSOCIATED WITH CUL-DE-SACS

Many of the benefits related to reducing the impervious surfaces associated with cul-de-sacs are the same as those of Element 4 (Restrict Maximum Impervious Surface Coverage). Reduced impervious area

allows opportunities for increased green space that when used for stormwater management enhances infiltration, can provide water quality treatment, and increased opportunities to plant trees that facilitate transpiration, evaporation, and interception of rainfall.

OLYMPIA CODE ANALYSIS

The Transportation Chapter of the City of Olympia Comprehensive Plan states that the City's street network should be well connected. The Comprehensive Plan establishes a vision for a dense grid of local access and collector streets to provide motorists with multiple ways to enter and exit neighborhoods instead of using arterial streets for neighborhood trips. Use of cul-de-sacs is limited to local access streets and is allowed only when prior development patterns and topographic and environmental constraints permit no other option.

The design requirements for cul-de-sacs are specified in Chapter 4 and 9 and in standard plan 4-5 of the EDDS. The standards specify that cul-de-sacs must have a 47 foot outside radius and must contain a center planter with a 17 foot radius. The center planter island is specified to be a pervious area that contains trees, landscaping ground cover, or low growing plants.

RESULTS OF CITY FIELD TEST

The biggest hurdle to modifying the dimensions of a cul-de-sac is identifying a size that accommodates the maneuvering room needed by both emergency vehicles and solid waste trucks. The City of Olympia performed field testing to determine what modifications, if any, could be made to the current cul-de-sac dimensional requirements. These tests demonstrated that the current requirement for an outside radius of 47 feet could not be modified, but the center planter island radius could be increased by 5 feet, from 17 feet to 22 feet. This increased center planter island radius reduces the impervious area of each future cul-de-sac by about 600 square feet over the current design standards.

The biggest hurdle to modifying the dimensions of a cul-de-sac is finding a modified size that still accommodates the necessary maneuvering room of both emergency vehicles and solid waste trucks.

The radius change does require a modification in current practice for solid waste container placement to allow sufficient maneuvering space for the solid waste vehicles. It is current practice for residents to place their solid waste containers within the cul-de-sac paved area. In order for a larger center island radius to be supported, the solid waste containers would need to be placed outside of the cul-de-sac paving behind the curb.

The center island of a cul-de-sac could potentially be used for stormwater management in the form of a bioretention cell. There are no barriers in the current City code that would discourage use of the center island for stormwater management as long as the proposed design meets the requirements of the City stormwater manual (DDECM).

OPTIONS CONSIDERED

The following options were considered.

- Option 1: No change.
- Option 2: Increase cul-de-sac center planter island radius to 22 feet.

ANALYSIS

Minimizing impervious surfaces is one of the three main goals of the Department of Ecology Phase II NPDES permit. Reducing the impervious area associated with cul-de-sacs could assist in meeting this goal.

Option 1 (no change) would maintain the status quo. This would not result in any reduction of impervious area. However, the current cul-de-sac size has been proven effective for emergency vehicle and solid waste vehicles maneuverability and function. Although the City did perform testing to determine whether these vehicles could maneuver in a smaller area, ability to make these movements can be dependent on the experience of the vehicle driver and other factors, and requires changes to solid waste collection procedures. However, the changes are not so substantial as to be a major obstacle to implementation of revised cul-de-sac design standards.

Implementation of Option 2 (increase center planter island radius to 22) will require updates to EDDS Chapter 4 and 9 as well as Standard Plan 4-5. For cul-de-sacs, this option will increase the green space within the cul-de-sac which will require additional plantings and result in a commensurate increase in maintenance requirements. Given the more constrained travel lane, more no-parking enforcement may be needed. Because sidewalks often border the cul-de-sac edge, it will also require a change in practice for placement of solid waste containers to behind the curb of the cul-de-sac. The modified cul-de-sac and tee turnarounds designs will need to include specific provisions for placement of solid waste containers – usually at the “throat” of the cul-de-sac. As cul-de-sacs with the new configuration are constructed, special notice will need to be provided to residents so that they properly place their solid waste containers.

RECOMMENDATION

Staff recommends Option 2. Option 2 reduces impervious area and maintains the ability to use the center cul-de-sac island for stormwater management.



Cul-de-sac built to current City of Olympia Standards.

