



Article 51

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Use of Open Space Design to Protect Watersheds

Clustering refers to a compact pattern of development at a site, also known as open space design. Clustering is not a new idea. It has been utilized for several decades in many communities around the country. Most of these cluster programs, however, were developed to meet general environmental, architectural or community objectives and were not designed explicitly for watershed protection.

Clustering does have a strong potential to reduce the total imperviousness of a site, fully protect all environmentally sensitive areas, and provide additional open and green space within a community. It works in a simple manner. A greater density of homes or structures on one portion of the site is traded for open space elsewhere on the site. The higher density is achieved by giving the designer more flexibility in reducing the size and geometry of individual lots than is normally allowed under subdivision codes.

Conventional subdivision codes contain rigid requirements that govern the minimum area of a lot, setbacks from the front, side and rear property lines, as well as minimum frontage requirements (mandatory width of the front yard) (Table 1). Together these requirements increase the distance between lots. Because the length of roads, sidewalks and other impervious surfaces is directly related to the distance between lots, a greater distance translates into more impervious cover.

When designed properly, cluster development can reduce site imperviousness by 10 to 50%, depending on the original lot size and road network. Some of the other benefits of cluster development are outlined in Table 2.

Communities have gained considerable experience in the use of cluster development over the past two decades. Our most detailed knowledge about local cluster programs is drawn from a national survey of 39 programs conducted by Heraty (1992). The responses from a wide cross-section of planners suggest that many current cluster programs may require significant modification if they are to achieve effective nonpoint source control. Some of Heraty's key findings include the following:

1. Most local cluster programs were not designed for the purpose of protecting streams or providing non-point source control.

Most local cluster programs were adopted for purposes unrelated to stream protection or urban nonpoint source control. Indeed, the five most frequently cited objectives for cluster programs were to achieve a greater variation in the style and design of developments (80%), protection of environmentally sensitive areas (primarily wetlands and forests, 77%), to provide community recreation areas (62%), to preserve the rural character of the landscape (51%), and to produce more affordable housing (39%). Only 18% of cluster programs were adopted as a means of reducing stormwater pollution from the site or as a technique to reduce impervious area. Most of the programs, however, acknowledged that clustering did reduce impervious cover when compared to conventional subdivisions.

2. Required open space in clusters is often poorly designed and fragmented.

Nearly every cluster program required that a portion of the site be retained in open space. On average, the minimum open space requirement for residential developments was one-third of total site area. However, an early problem reported by many communities, however, was the fragmentation and poor quality of the open space. In some cases, open space was poorly landscaped and widely scattered across the entire development. Consequently, the open space contributed little functional value to either the community or the environment. A third of all cluster programs now require that a minimum percentage of open space should be consolidated. The average consolidation requirement is 70% of total open space (range: 30 to 100%).

3. Few cluster programs require that a portion of open space should be protected as green space.

The survey reported that very few cluster programs required that any portion of open space be reserved as "green space" or undisturbed areas in native vegetative cover. Less than 10% of all programs had such a requirement. The provision of green space would greatly amplify the environmental benefit of clustering.

4. Cluster programs rarely specify what are allowable and unallowable uses of open space.

A great deal of variation was seen in the kinds of uses and activities that were allowed or denied within