

Zenon Tech-Czarny
Biores Engr Design I
Professor Obropta
Assignment No. 1

Cluster Development

Introduction

Cluster Development is the grouping of residential properties on a proposed development site in order to use the extra land as open space, recreation or agriculture.¹ It is increasingly becoming popular in subdivision development for its low impact and sustainability appeal. The idea of clustering housing units dates back to early settlements when houses were grouped to form a common area to defend themselves.² Today it has serves other advantages that are more applicable, including more green/public space, closer community, and an optimal storm water management setting. Though cluster development has many benefits, it does have its issues such as outdated zoning, perceptions of personal space and maintenance of common areas.

According to William Whyte, the author of “Cluster Development” there are two types of cluster development. One type is a townhouse development and the other type is a super development. Some examples of townhouse development are Morrell Park in Philadelphia, Hartshone in Richmond, and Dudley Square in Shreveport. Examples of Super Development include Reston in Virginia, Crofton in Maryland, and Americana Fairfax in Virginia.

Background

In many ways cluster development has been around since the earliest communities — from the medieval village to the New England town. Though, it wasn’t officially a concept until the onset of suburban sprawl and rise of the ubiquitous detached house

¹ Whyte 1964

² Smart Growth Codes

developments. The idea of a Cluster development was created as the alternative to the 'conventional subdivision'. The first conscious application of a Cluster development was in Radburn, New Jersey in 1928. Though it was based off English planning and Ebenezer Howard's Garden Cities movement, it used principles of cluster development. Following Radburn, many other towns' in New Jersey applied those principles to their planning notably the 'village green' in Hillsborough and Brunswick Hill in South Brunswick.³ In the rest of the country the use of cluster development grew in principally in Maryland and Virginia; notably in Reston and American Fairfax County.

Currently cluster development is applied all over the country. There is particularly a strong push for it in the Midwestern states that have had significant problems with large lot suburban sprawl, such as Minnesota, Illinois, Ohio, and Wisconsin.

What is Cluster Development?

Cluster Development also known as conservation development is a planning approach that is an alternative to conventional subdivision development. It is a practice of Low Impact Development that groups residential properties in a proposed subdivision closer together in order to utilize the rest of the land for open space, recreation or agriculture. Cluster development differs from a planned unit development (PUD) due the fact that a PUD contains a mix of residential, commercial, industrial, or other uses were as the cluster development primarily focuses on residential area.⁴

³ Whyte

⁴ Ohio

Purpose

The purpose of cluster development is first, to promote integrated site design that is considerate to the natural features and topography. Second, protect environmentally sensitive areas of the development site, as well as permanently preserve important natural features, prime agricultural land, and open space. Third, minimize non-point source pollution through reducing the area of impervious surfaces on site. Fourth: encourage saving costs on infrastructure and maintenance through practices such as decreasing the area that needs to be paved and the decreasing distance that utilizes need to be run. Lastly, the fifth primary purpose is to create more area for open space, recreation and more social interaction.⁵

Benefits

As mention before, the benefits of cluster development as opposed to a convention subdivision include: more preserved land for open/recreational space, a better setting for community building, possible local agriculture production, and an optimal arrangement in storm water management; furthermore cluster development makes more ecological and economical sense.

By clustering residential properties there is less impervious surface and more natural drainage which reduces storm water flooding, and soil erosion. As well, strategic areas in the extra space can be used trap nutrients and suspend runoff.⁶ Economical benefits include having fewer roads, sewer/drainage, and electric/gas utility infrastructure to

⁵ Smartgrowth code

⁶ Arendt 1994, 278,

construct. Also higher density means reduced travel time for services as well as the possibility for public transportation, increased bicycle usage, and pedestrianism. This subsequently would mean less petroleum usage, and Co2 emission; as well, there is the possibility of having Community Support Agriculture (CSO) which decreases food miles and supports local economy. Higher density also has implications for an increase in recreation and community.

Issues

Following World War II, an all-pervading migration from the cities to suburbs became the dominant trend in America. People were acquiring any land they could find; as a result developers attempted to squeeze as many lots as they could on development sites. Communities then developed zoning regulations to limit the number of units and density allowed on a site. Though this zoning protected land for communities and to an extent preserved land from development, it was what ultimately led to the suburban sprawl as we know it today.⁷ It is this zoning that cluster development attempts to amend, and is the primary issue it faces.

Most municipalities have established zoning which restricts developers, planning boards and communities to only use this conventional subdivision development. Thus, the practice of traditional development is difficult to change due the set standard, familiarity of the procedure, and the fear of undertaking something new. In response to this, groups such as the American Planning Association have developed a model ordinance that provides the framework for cluster development. This ordinance is not difficult to

⁷ Whyte

administratively implement, though politically it is problematic due to conservative resistance.

People's perception of personal space has a large part to do with this resistance. Many cases people chose to live in suburbs with the intention of having a large lot property; therefore it is hard to convince those individuals to live closer together. Convincing people to accept small lot sizes and higher density living remains one of the biggest obstacles of cluster development. This obstacle can be mostly overcome with proper site design that grants homes unobstructed views and effective private space. As well as educating people about the benefits of having better community and open space can serve as encouragement to change perceptions.

The final primary issue with cluster development is the issue of dealing with open, recreational, and agricultural space. These areas do serve as benefits in many respects although they are also issues that are required to be dealt with. The maintenance of open and recreational space requires the formation of home owners associations that necessitate fees for taxes, insurance and general upkeep. This would not be necessary under a typical subdivision, though people would have their own maintenance expenses. As to agriculture: people enjoying living next to it until there is a need to apply fertilizer or pesticides. This fact cannot be avoided, though through the proper use of cluster development there can be wider gaps and barriers between agricultural land and residential properties, which would limit exposure to unwanted byproducts.

Application

The model ordinance for cluster development is section 4.7 in the Smart Growth Codes, issued by the American Planning Association. Along with introducing the concept of cluster development, the ordinance outlines the process of application, site planning and implementation.

The primary requisites for application of cluster development are that all principle/ accessory uses are allowed and that multifamily dwelling, duplexes, townhouses are permitted. As well the application of maximal lot coverage, floor area ratios, building height, and parking requirements to the entire site as opposed to the individual lot. Provisions of a cluster development require that the site is at least 2 to 5 acres and there is no minimum to lot dimensions; furthermore each house can be no more than 12 feet from the street with yard that is at least 25 feet. There also needs to be the ability to place more than one principle building on each lot, and lastly no less than 25% of the site is used for open space.⁸

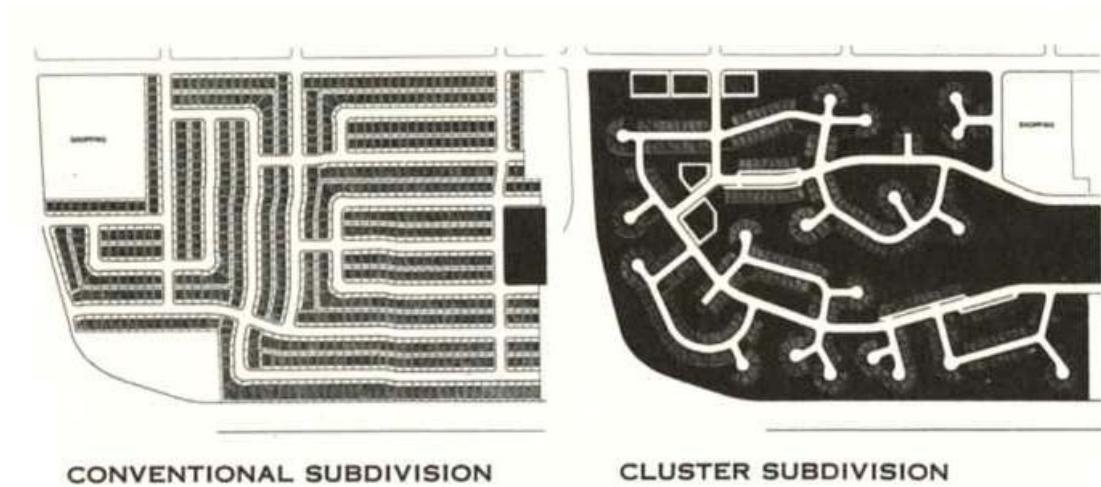
Included in the application, the site plan is required to consist of the street/sidewalk layout, the maximum number and type of dwelling units proposed, and how much area they will occupy, with calculations; as well as the area of parking, open space, and other accessories. To calculate the permitted amount of dwellings, one must measure the gross area of the site in acres and tenths of an acre, then subtract the gross area of the public/private streets and public dedicated improvement; the remainder will be the build able area. Then divide the net build able area by the smallest minimum lot size; round this number to the nearest lower number and the figure will be the maximum number of units.

⁸ APA

Design Features

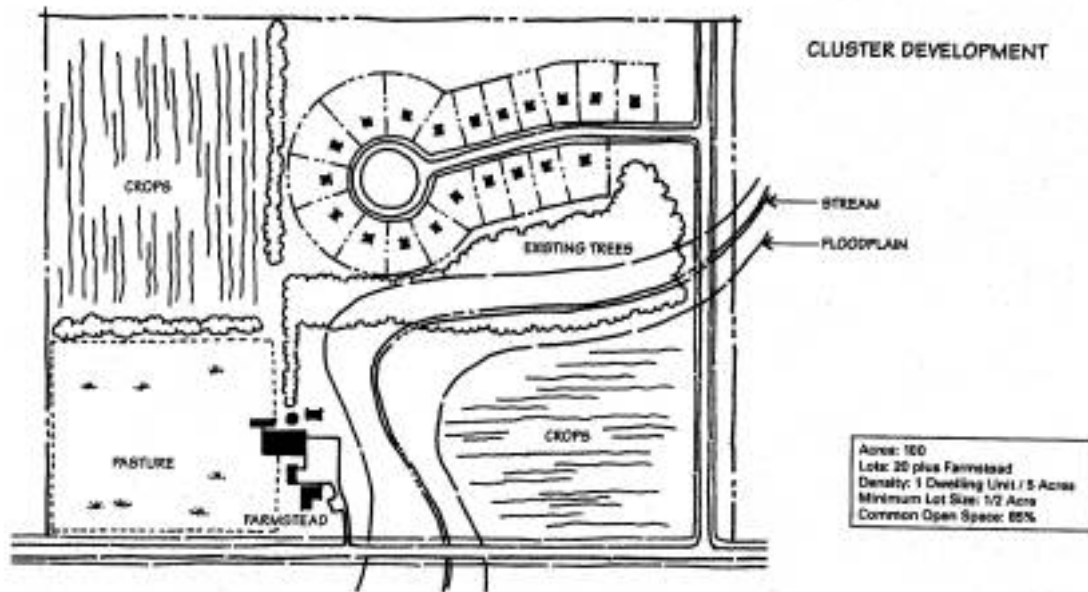
There are various distinct design features in cluster development notably: the consideration of natural features/topography, smaller lot size, the use of cul-de-sacs, and certain waste/storm water management techniques.

In the following example below two site plans for a development are presented, the conventional subdivision and the cluster development. The conventional shows a traditional layout in where the entire site cut up in a rectilinear fashion with no consideration for natural features, topography, or space. The cluster development on the other hand is designed with natural features, and topography in consideration. As well, it has narrower roads and tighter lots, which create a sense of space in human scale.



The diagram on the follow page shows a close up example of a cluster development. This model illustrates various design features used. It first avoids the stream and floodplain, then preserves pasture/crop land and provides a barrier between the residential properties.

Lastly the homes are arranged a cul-de-sac layout, with smaller lots and are grouped closer together.



Along with site design, waste/storm water management design features are a principle aspect of cluster development. Through the maximizing of over land water flow and the strategic use of landforms and plants to slow, hold, and treat runoff it is possible to handle the majority of storm water. As well, there many options in dealing with waste water; techniques such as community drain fields, irrigation systems, and package plants can dramatically reduce the cost of infrastructure, and improve the environment.⁹

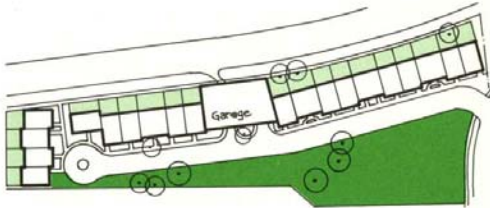
Examples

Dudley Square is an example of townhouse cluster development according to Whyte's book "Cluster Development". It is located in Shreveport, Louisiana and is Georgetown type development on the upper price scale. The established zoning required 6,000 square

⁹ Michigan

foot minimum lots. After applying cluster development the developer was able reduce that area to 1,500 square feet and use the rest of the space for a common green.

Dudley Square site plan.



Dudley Square townhouses.

Reston, Maryland is 10.5 square mile example of a “Super Cluster Development”. It was designed with the notable consideration of the existing terrain. The properties are grouped into seven villages of approximately 10,000 people. Most of the site is woods and meadow, though there are five golf courses and two lakes.



Model of first village at Reston.

See Also

Conservation Development

Low Impact Deveopment

Planned Unit Development

Environmental Planning

New Urbanism

References

William Whyte “Cluster Development”

Smarth growth code from planning.com:

<http://www.planning.org/smartgrowthcodes/pdf/section47.pdf>

Ohio States page:

<http://ohioline.osu.edu/cd-fact/1270.html>

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<http://www.extension.umn.edu/distribution/naturalresources/components/7059-01.html>

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<http://www.uwsp.edu/CNR/landcenter/tracker/summer2002/consubdiv.html>