

Conservation Subdivision Design: A Brief Overview

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An approach to laying out subdivisions so that a significant percentage of buildable uplands is permanently protected in such a manner as to create interconnected networks of conservation lands. The percentage of protected land varies according to project density, rising from 30-35% at density levels of three or more dwellings/acre, to 75-80% at four or more acres/dwelling.

This approach is distinct from earlier "clustering" and "planned unit development" (PUD) in terms of both the higher open space ratios and in terms of conscious design to forge community-wide networks of open space.

This is primarily a design approach for conserving existing natural and cultural resources, although a limited amount of active recreation is permissible (such as ballfields and neighborhood greens). Subdivisions where the majority of open space is taken up by a golf course do not meet this basic criterion.

Conservation subdivisions are generally "density-neutral", meaning that the overall number of dwellings built is not different from that done in conventional developments. Small density bonuses are sometimes granted in return for dedicating some or all of the conservation land for public access or use, for endowing permanent maintenance of the open space, or for providing workforce housing.

Conservation subdivisions are specifically designed around each site's most significant natural and cultural resources, with their open space networks being the first element to be "green-lined" in the design process. This open space includes all of the "Primary Conservation Areas" (inherently unbuildable wetlands, floodplains, and steep slopes), plus 30-80% of the remaining unconstrained land, depending upon zoning densities and infrastructure availability.

The site planning process begins with general mapping of the project site in its context of surrounding properties (up to 2000 feet away, typically mapped at 1" = 400 feet). On this *Location Map* (compiled from existing published data) are shown vegetative cover, topography, soils, and floodplains. This initial map informs decisions regarding the design of the interconnected open space network.

A more detailed, site-specific *Existing Resources and Site Analysis Map* is then created, identifying significant natural and cultural resource, such as productive cropland, wildlife habitat and travel corridors (meadows and forests, stream valleys), and significant trees, with size thresholds related to species: 4-6 inches for smaller species such as dogwood and redbud, 8-10 inches for medium species such as sassafras, cherry and water beech, 12-14 inches for slow growing hardwoods (oak, maple, ash), and 15-18 inches for fast growers (tulip poplar, sycamore, conifers). Historic or cultural resources such as farmhouses, barns, cellarholes, wells, stone walls, earthworks, trails/traces, and hedgerows are also identified, usually through GPS. (A photo essay illustrating such resources can be seen at [://www.terrain.org/articles/18/arendt.htm](http://www.terrain.org/articles/18/arendt.htm)).

A four-step process then ensues, Step One separating the site's resources into two categories. The first, Primary Conservation Areas (PCAs), are limited to inherently unbuildable wetlands, floodplains, and steep slopes (>25%). Secondary Conservation Areas are comprised of "the best of the rest". Because the PCAs would be off-limits to development in conventional developments in any event, they are not counted toward the minimum required open space percentages of conservation subdivisions. Therefore, 30-80% of the buildable land is usually designated as SCAs, depending on density (as noted above).

Because the principal purpose of conservation design is to permanently protect interconnected networks of upland habitat (woodlands, meadows, etc.) and productive farmland, golf courses are not an appropriate use for the open space. However, some limited active recreation for neighborhood residents (such as ballfields) would count as part of the required open space.

Step Two consists of locating house sites in relation to the protected open space, to add livability, marketability, and value to the homes. The third step is to "connect the dots" with streets and trails. Step Four consists simply of drawing in the lot lines.

This process works best when guided by a landscape architect or physical planner, collaborating with a civil engineer. The creative skills of a landscape architect or physical planner are essential, balancing the technical training of engineers whose expertise lies principally in streets and drains.

The optimal design process begins with a site walk by the LA/planner and engineer, landowner, and developer, with the *Existing Resources Site Analysis Map* in hand, usually reproduced on an aerial photo at the working scale. The design is done in the field or immediately afterwards, on thin tracing paper so that the underlying resource information is visible to the designers, who typically work with pencil and eraser. (CAD technology is never used at this initial design stage, but is invaluable for later revisions.)

The resulting *Sketch Plan* is then shown to local officials, some of whom may have been invited to join the designers on their initial site walk. Officials who have not yet walked the property are strongly urged to do so during a subsequent site visit prior to voting on the *Sketch Plan*, whose merits (or lack thereof) will become clear when examining the drawing while standing on the property and observing the terrain, landscape elements, cultural features, etc.

After completing the above procedures, the time is right to prepare the highly detailed, expensive, *Preliminary* and *Final Plans*. Many municipalities inadvertently cripple their open space preservation efforts by skipping the critically-important *Sketch Plan* stage, and allowing (or requiring) applicants to submit highly detailed engineering documents at the so called "*Preliminary Plan*" stage. These cost so much to prepare that they lock applicants into whatever initial layout is prepared, usually with minimal previous consultation with staff or officials.

The above paragraphs summarize the key points relating to necessary improvements to most local subdivision ordinances.

Zoning ordinances work best when density is established directly (such as by designating density as three units per acre in sewered areas, or two acres per dwelling in unsewered areas) instead of indirectly (such as through minimum lot sizes, e.g. 12,000 sq. ft and 88,000 sq. ft). As long as density is regulated indirectly through lot size, subdivisions will consist of nothing more than houselots (of that size) and streets, with no open space.

After separating the notions of lot size and density, treating them as independent variables, zoning works best when conservation design is designated as a by-right Permitted Use, making applications simple, straight-forward, and relatively easy. Conventional developments can be actively discouraged by re-classifying them as Conditional Uses. The condition to be met is a clear and compelling showing at a public hearing, convincing officials that dividing land into just houselots and streets better implements official *Comprehensive Plan* policies, such as farmland preservation, habitat conservation, rural viewshed protection, etc. (a showing that is usually impossible, as conventional developments are inherently contrary to such planning policies).

In the absence of any co-ordinated nationwide tallying, the informal records for land saved through conservation design ordinances appear to be held at the municipal level by Hamburg Twp., Livingston Co., MI with more than 2000 acres, and at the county level by Hanover County VA, with more than 5000 acres (as of Summer 2008).

Conservation design can be blended with "traditional neighborhood design" (see the "New Urbanism"), and in areas with public water and sewerage this is particularly achievable. There is no inherent conflict with designing such development around significant site features and integrating mixed-use planning with the creation of greenway networks. (See also *Crossroads, Hamlet, Village, Town: Design Characteristics of Traditional Neighborhoods, Old and New*, American Planning Association PAS Report No. 523/524, 2004).

Resources for further reading: www.landchoices.org, www.greenerprospects.com, natlands.org, www.mnland.org/prog-consplanning.html (containing many case studies), and www.landchoices.org