



HOW TO Planning Series

Reduce Non-Point Source Water Pollution in Rural Areas: Promote Open Space Conservation/Cluster Development Subdivisions

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Introduction

When it rains or the snow melts, or land is irrigated, water flows over the land and through the ground. The water that flows off the land and into receiving waters is called runoff. As the water moves it can pick up and carry away natural and human made pollutants. Pollutants carried in the runoff are eventually deposited into wetlands, lakes, rivers, coastal waters, and underground drinking water sources. Scientists call this type of pollution nonpoint source because it does not have a single point of origin, nor is it introduced from a single outlet.

Pollutants can come from both air deposits and land uses. The source could be: soil erosion from construction sites; oil, grease and toxic chemicals from driveways and roads; excess fertilizers and herbicides from lawns, agricultural fields, and golf courses; bacteria and nutrients from pet wastes and faulty septic systems.

Since the polluted runoff comes from a combination of what people do on the land, all of us are part of the problem and the solution.

As the population continues to increase, communities will have to grow to accommodate more people. Communities experiencing growth have several options to manage growth. The first option involves accepting unplanned development patterns and working to live with the consequences.

The second option involves being proactive - planning for future growth and development. By taking the time to plan for the future, communities can preserve open space and reduce non-point source water pollution. Critical to this planning and prevention is requiring open space conservation cluster development.

What is Open Space Conservation/Cluster Development?

Open Space Conservation/Cluster Development (OSC/CD) is a type of subdivision design that allows for the preservation of important land features such as open fields, hilltops, wetlands, etc. OSC/CD Subdivision locates houses on smaller parcels of land, while the additional land that would have been allocated to individual lots is converted into common shared open space for the subdivision residents. This open space is permanently set aside for public or private use and will not be developed.

Typically, lot road frontage, lot size, setbacks, and other traditional subdivision design requirements are reduced to permit the developer to preserve land features, ecologically sensitive areas, historical sites, or other unique characteristic of the land being subdivided. This approach has financial benefits also for the developer, homeowner, and community.

Conventional Subdivision Development

In a conventional design, if a developer owned 36 acres of land zoned with a minimum lot size of 2 acres, the developer could divide the land into a maximum of 18 lots, given no site constraints. This would result in all the land being allocated to each individual parcel, resulting in no or limited protection of land features. In the picture to the right, the development has been sited in the farm field with breaks in the hedgerow, a great edge habitat for wildlife.



Development using Conventional Subdivision Design

Randall Arendt

Open Space Conservation/Cluster Development

In an open space conservation/cluster development (OSC/CD), if a developer owned the same 36 acres of land with a density of one dwelling unit per 2 acres, but with varying lot size based on the suitability of the soil for septic systems and a minimum 50% open space requirement, the developer could still get 18 lots but on smaller lot sizes. The remaining land could be used for open space recreation, river and wildlife protection, walking paths, and other conservation related practices. In the second picture to the right, the hedgerow and farm field have remained intact, and homes have been sited adjacent to existing infrastructure and homes.

Financial Benefits of OSC/CD

Lower Costs – Infrastructure engineering, construction and long-term maintenance costs can be reduced by 20-30%, as compact developments allow for shorter streets, utility lines, and other efficiencies. The size and cost of stormwater management facilities can be reduced as a result of less street pavement.

Marketing and Sale Advantages – Realtors and developers can capitalize on preserved open space by marketing the benefits of living in a community where forest habitat, wetlands, and greenways have been protected.

Value Appreciation – OSC/CD subdivisions tend to appreciate in value faster than conventional subdivisions.

Property Taxes – There is no loss in property taxes, and there may be higher revenues due to higher appraised value.

Environmental Benefits of OSC/CD

Improved Water Resource Protection Through Less Nonpoint Source Pollution – OSC/CD subdivisions generate less stormwater runoff than conventional subdivisions because of the larger areas of natural vegetation. These natural areas trap pollutants from stormwater runoff and prevent them from entering nearby surface waters reducing nonpoint source water pollution.

Greater Aquifer Recharge – Conventional subdivisions have more impervious surfaces and suburban lawns. This results in less rainfall infiltrating into the ground, reducing the amount of water available to replenish the aquifer. An OSC/CD subdivision reduces the total area of impervious surfaces and lawns allowing more water to recharge the aquifer.

Wildlife Management – OSC/CD subdivisions preserve greenways that provide important wildlife habitats and travel corridors for animals in the area.

Social and Recreational Benefits of OSC/CD

Pedestrian-Friendly Neighborhoods – OSC/CD subdivisions create pedestrian friendly neighborhoods designed with inviting places to walk and interesting destinations, such as scenic views, meadows, lakes, and playing fields.

“As much as 65% of the total impervious cover in the landscape can be classified as habitat for cars”

The Practice of Watershed Protection, 2000, pg 253.



Development using Open Space Design

Randall Arendt

“...Sending rooftop runoff over a pervious surface before it reaches an impervious one can decrease the sites by as much as 50% ...”

The Practice of Watershed Protection, 2000, pg 259.

What stays the same when we use Open Space Conservation Design?



Native vegetation and river frontage



Mature trees and scenic views along roads



Viable farms



Recreation areas

Frequently Asked Questions

1. Will there be a loss of property tax revenue?

No, in fact property value may increase. Land in current use will be assessed at the new market rate and land retained as open space will be assessed as part of common area of the development in conjunction with the individual property assessments. Open space land dedicated to the Town would not be taxed. However, surrounding land that benefits from the preserved open space will increase in assessed value and offset the perceived reduction.

2. Will the project be delayed?

No, if the conservation subdivision ordinance and regulations are clear and well formulated there will be no time delay. Further it may expedite approval.

3. Why pay Homeowner Association Fees?

These fees benefit the residents of the conservation subdivision by maintaining their investment creating increased property values.

4. How close will my neighbors be?

Smaller-sized lots often result in close proximity to neighbor's homes and may be a disincentive. If lots and housing layouts are designed and sited carefully, each house will have a private unobstructed view that overcomes the disadvantage of the small lot size. Also lot size may vary based on the soil carrying capacity rather than a fixed minimum lot size.

5. If conservation development standards are not well known to homeowners, then why use it?

Developers have found a strong market for conservation subdivision housing units. If some homeowners want conventional single-family homes on larger lots, then why develop a conservation subdivision? First, if customers want larger lots, they can still be clustered to protect land features. However fewer lots will result in increases in price. Second, developers have found a strong market for conservation subdivisions as the market becomes more environmentally concerned.

6. Do developers have to prepare a conventional design as well as a conservation design?

No, however some municipalities may require developers to prepare a conventional design as a pre-requisite for a conservation design. This increases time and costs. If the conservation development ordinance is clear, well formulated, and allows flexibility, this may be unnecessary.

7. Is additional planning needed in an open space subdivision for septic management?

Stormwater run-off and septic management can take additional planning in an open space conservation subdivision. There is concern over shared septic/water systems. It should not require any more planning and the benefits are tremendous.

8. How can the conservation lands be permanently protected?

Placing a conservation easement on the land can effectively protect conservation lands. Easements permanently protect the land and are usually held by a land trust or a unit of government. Land trusts are a reliable holder of easements because their mission does not change. A conservation restriction that runs with the deed is another method used to protect the lands with responsibility for management placed with the owner or homeowner's association.

Four Steps to Implement Open Space Conservation / Cluster Development

Step 1: Identify the critical and secondary conservation areas where no development would be permitted. This may include wetlands, steep slopes, wildlife habitats, historic farmsteads, streams, or valuable agricultural fields. Once these conservation areas are identified, it is possible to identify potential development areas.

Step 2: Require the developer to submit a soil survey to determine the number of houses allowed on the site. The planning board should require the soil survey, prepared by a certified soil scientist. The survey should include the non-buildable areas, and calculate the number of homes allowed based on state soil based lot size requirements. Remember the overall density (e.g. the number of homes per acre) should be consistent with the Master Plan and must not exceed the zoning ordinances.

Step 3: Link the homes with roadways and walkways. There are several road designs such as a main feeder road that branches off with either small cul-de-sacs or shared driveways to serve small clusters of homes. Narrow roads with homes on just one side of the street, with open greens between roadways are another option. It is important to keep in mind any new road's relationship with the existing street systems and connections to adjacent lands. Be designed to provide residents' access to the open space lands via trails. Also remember these walkways should connect to larger walking and biking systems in the community.

Step 4: Drawing the lot lines and defining the commonly held open space land. Zoning ordinances should be amended to permit any lot size or configuration and require 50% of the buildable area be allocated for conservation land. This enables the developer the same number of home as a conventional subdivision, better design, more conservation, lower costs and less non-point source water pollution. In a traditional subdivision this would be the first step, with much less emphasis on neighborhood design and more emphasis on zoning ordinance requirements. Conservation of open space is the first priority in and many planning officials have commented that applying this process to an actual parcel of land is much more difficult than it sounds. Planning boards should be discouraged from the goal of preserving open space and community resources.

Meeting Planning Board & Developer Needs

For OSC/CD to work effectively Planning Boards and developers must understand each other's needs. Most developers will consider open space conservation/cluster development subdivisions as long as it offers a good business investment. Some developer needs and requests include:

Want to make a profit – Developers will set aside more open land and redesign site layouts if the community is willing to be flexible, This provides them an opportunity to still make a profit.

Assurance of a profitable market for the final product – The real estate community can be educated about market potential of building open space developments and about the long-term benefits for the community.

Timely review and approval –Developers will avoid open space conservation developments if the review process is longer than for conventional developments. Ordinances should be written so the developer will go through the same process regardless of the type of subdivision being proposed.

“In order to protect the community’s existing open space network, municipal officials should consider amending the zoning ordinance to include special techniques for ‘creative development’.”
-Randall Arendt
Growing Greener, pg 144

“Experienced developers recognize the importance of siting the homes before street alignments have been set, because they realize that their principal sales products are the homes and not the street system or the lot boundaries.”
-Randall Arendt
Conservation Subdivisions, pg 96

State Agency Supports Local Efforts

The Department of Environmental Services in 2004 released the *Best Management Practices to Control Nonpoint Source Pollution: A Guide for Citizens and Town Officials*. It is available online at www.des.nh.gov/WMB/was/ in pdf or by request. A second resource is *The Practice of Watershed Protection*, by Thomas Schueler and Heather Holland. Strafford Regional Planning Commission has copies available for the public in our offices in Dover, NH.

We have highlighted key management techniques relating to nonpoint source water pollution and Open Space Conservation/Cluster Development.

Use of Low Impact Development Techniques for Site Development will:

Minimize clearing and grading of the site.

Minimize impervious surfaces.

Disconnect impervious surfaces to minimize quantity and velocity of surface runoff.

Provide for onsite management of runoff.

Locate systems in areas that are less sensitive or have lower hydrologic function.

Use open, vegetated drainage systems.

Use small-scale management practices distributed through the site.

Require periodic monitoring and maintenance of systems.

Low-impact development (LID)

This approach focuses on increasing the infiltration of stormwater, maintaining natural hydrology of the development site, and limiting impacts to the site habitats.

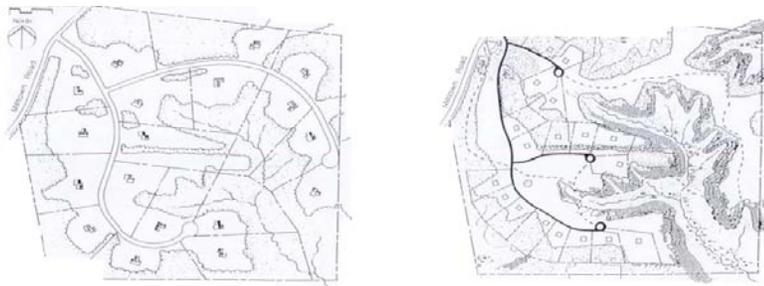
The site planning concepts for LID are: to use hydrology as the basis for designing new development, to think micromanagement for stormwater control, to control stormwater at the source, to use simple, nonstructural stormwater control methods when feasible, and to create a multi-functional landscape and infrastructure.

Open Space Conservation/Cluster Development

One aspect to siting these subdivisions is to locate them in proximity to developed areas. This provides an opportunity to connect to sewer systems reducing possible nonpoint source pollution from septic systems. It also limits the amount of pipe and possible leaks. Siting close to other development provides an opportunity to not use vehicles or shortens the distance traveled, all of which decrease air pollution.

When open space conservation/cluster developments are sited close to existing roads, there is less impervious surface created. When they are sited away from surface waters, there is an increased opportunity for treatment of the runoff before it reaches the waters. Other practices to include in the design are:

- Sidewalks and trails on one side of street only.
- Narrower roads and right-of-ways.
- Smaller lots, frontages, and setbacks to minimize impervious coverage.
- Maximize amount of land retained in natural state.
- Reduce parking areas and promote shared driveways.
- Promote permeable paving materials as a driveway alternative.
- Direct rooftop runoff to pervious areas.
- Use drought-tolerant, native species for landscaping.
- Maintain significant vegetative buffers for surface waters.
- Leave the vegetation in the buffer - do not mow to the edge of water.



These diagrams, prepared by Randall Arendt, illustrate a conventional subdivision layout on the left, and an open space conservation subdivision layout on the right.

**Implementing Open Space Conservation / Cluster Development
is an effective strategy to reduce non-point source water pollution.**

**Open Space Conservation / Cluster Development Subdivisions –whatever descriptor is applied -
these subdivisions have similar planning and design principles.**

**Using these planning and design principles creates major financial, environmental, social, and
recreational benefits.**

**Planning decision-makers can achieve sustainable development by adopting and implementing
Open Space Conservation / Cluster Development Subdivisions.**

**SRPC recommends that Open Space Conservation / Cluster Development Subdivision be required
for major subdivisions and other subdivisions where a new road is needed.**

**Contact SRPC for a model “Open Space Conservation / Cluster Development Subdivision” Zoning
Ordinance.**

**Citizens, developers and the environment win with open space conservation / cluster development
subdivisions.**



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