



Planning for Rural Site Development Phase I: The Site Inventory

By John Gower

In my two previous articles I discussed the kind of information and preparation one needs before looking for rural land to purchase. Knowing one's lifestyle goals, budget, and a little bit about the concrete physical details of dealing with land are the prerequisites for a successful search.

Let's assume that you now have a piece of property that suits your needs and life situation perfectly. Whether your goal is now to construct a weekend or summer getaway, or to fully move the focus of your life into a permanent home on the land, you are about to embark upon the challenging and rewarding experience of land development.

At this stage in the process you may already have a pretty clear idea of what you're going to build and where you're going to put it, i.e. "The road's going in here and the house will sit on the point with the picture window looking down the lake...."



If you are lucky and conditions are beneficent and straightforward, this may be all the planning you really need. A small lakeside lot in an area of summer cottages, for example, may present very few choices in regard to the location of your dwelling. In order to make decisions about the driveway, septic system, and other services, a survey of your neighbors will answer many questions and in most cases you can follow suit.

Larger lots, steeper terrain, or completely undeveloped areas, on the other hand, may present additional choices as well as potentially serious development challenges. Having more complex development objectives makes the process more complicated. There needs to be a systematic way of assessing your property and then creating a plan to map out the future course of work.

In any development situation, there is no such thing as too much information. Know as much as you can about your land before you start to plan to help you consider all options, likely save you money, protect valuable assets, and result in the best possible final result. So, the place to begin, once you have a good idea of what you want, is with a full inventory of your property.

An inventory is simply taking stock of all the land's assets, deficiencies (relative to your goals), physical constraints, and natural attributes. It proceeds from the regulatory constraints imposed by zoning or bylaws through the tangible qualities of soil, terrain, and climate, to the more subjective qualities like aesthetics and "sense of place." When it's complete, your inventory will have made you the expert on your land and you will likely be pretty clear about how to proceed with the next step.

What is important to consider? I offer the following list as a basic guide to the myriad factors you might want to look at.

Zoning

The first thing you should be aware of is whether there are zoning or land use bylaws in effect for your property. Such bylaws will designate such things as building setbacks from property lines, allowable land uses, the number of dwellings permitted on the lot, the height of buildings, and so forth. If the bylaws conflict with your intentions, don't despair immediately. You may be able to obtain a variance or relaxation.

The easiest way to find out your status and available options is with a call or visit to the planning department of your local Regional, District, or Municipal office. Have the legal description of your land with you, as it will be required before they will look anything up for you. While you're there, ask about any floodplain hazards that might relate to your project. Regional authorities have whole lists of requirements for construction in such areas, and the sooner you know about them the better.

Property Boundaries

Next, you should become intimately familiar with the boundaries of your land. You can do this yourself by taking the surveyed plan and a compass, finding the corner pins, then walking the property lines, flagging or blazing the line as you go. Beware, though. Even when you do find pins, do not assume they are the corners unless you find 2 or 3 others and the distances between them corresponds to the plan. A surveyor will of course be happy to take the guesswork out of it for you at a cost of \$1000 and upwards.

Regardless of who lays them out, a careful walking of the boundaries is a very important first step, especially in areas with woods or undulating terrain, and it will really help you to visualize the totality of your land when you begin to lay out roads and buildings on paper. It also will familiarize you with the adjacent properties and possibly give you some idea of how they might be developed in the future, thus letting you consider the long-term view and privacy of your own dwelling.

Location of Nearest Services

While you are out roaming your land, you should be asking yourself where water and electricity are coming from and where your domestic waste will go. If you have unlimited funds at your disposal, the location of services relative to where you plan to ultimately build may not really be that important. After all, what's a few extra power poles at \$2,000 to \$4,000 a pop? Most of us mortals, though, must balance our objectives with our fiscal realities and attempt, where possible, to site dwellings and outbuildings reasonably close to a water supply and the hydro grid. Because of the ever-present risk of blow-downs, the hydro right-of-way will need to be well cleared of potentially hazardous trees - often a major undertaking - and it's often easiest and cheapest (though not my favourite, aesthetically) to run the lines alongside of the driveway. You might consider, too, the option of running the poles along the property line, especially if there is a possibility of sharing the service (and costs) with your neighbour.



Similar advice applies to the water system. If you have to drill a well, then plan to put it as close as practicable to where it's needed. A drilling site needs to be a relatively level area, accessible, and able to accommodate two large vehicles (usually parked back to back when drilling).

Whatever happens, try to avoid doing what one client did. Uncertain about where to begin, he unfortunately drilled his 500'- deep well first, before having the final location of the house or any of the other services pinned down. It's a large parcel and the house has since been relocated to a new site more than 1100 feet away from the well, necessitating an additional \$8,000 in water lines, trenching, and power supply to the pump.

If you are on a community water system or have your own gravity system, the cost and logistics of installing your water line is of more primary concern, especially in areas with bedrock close to the surface or cold winters where the frost protection depth for the line can be as much as 5'. Having personally suffered through a number of winters with frozen lines, I offer this advice: plan to bury it as deep as they say you should!

The other very important consideration is the septic system. Most jurisdictions require you to provide two absorption fields (one primary and one backup), which range in size from 20' by 60' to 40' by 100' or more, depending on the number of bedrooms you plan to have and the permeability of the soil. The criteria for these fields are quite strict: 100 feet from wells and springs, 100 feet from the high water mark of any body of water or watercourse, 10 feet from property lines, slope less than 30%, acceptable percolation rates, and a good soil profile. It is good to know right at the beginning where the approved sites are on your land and when the time comes to site your dwelling, do it in awareness of this. As I've said in this column previously, try to keep the whole system running downhill with gravity and avoid pumping if at all possible. Low-tech solutions are almost always the best solutions, especially in more remote locations.

Topography

Now that you have a good sense of the shape and extent of your parcel, you can look in more detail at the ups and downs of the land itself. Topography, or "relief", in addition to limiting septic sites, affects views, possible house site locations, access grades and costs, and micro-climatic effects as well as the final design of your house or cabin. Frequently, on complex sites I will order a topographic plan from a surveyor to accurately show these slopes and grades (and, usually, significant trees, rock outcrops, and existing structures as well) before beginning to draw. These cost as little as \$300 - \$400, depending on the lot size and the availability of reference points (i.e.: clearly demarked corner pins) and take a lot of the guesswork out of planning and design later on. If the parcel is overgrown with low vegetation, it's often almost impossible to get a sense of the lay of the land. Try getting there in the winter or early spring when snow has flattened the undergrowth, or, spend some money or time clearing the brush to open things up.

If your survey uncovers a dramatic rock bluff where you think you might like to put your dwelling, you should be aware of the implications of building near steep slopes. In many cases a geotechnical study is required, to confirm that the ground is stable and not prone to fracture (if building on its crest), or that no loose material can imperil your home if you build below.



Soils

You can usually determine what you need to know about the soil conditions on your property by looking around. As a rule, sites that are roughly level or that have a simple aspect and not a lot of topographic variation will likely have pretty consistent soils throughout. On more complex sites, geological processes will have resulted in a more varied substrate.

You can find out about your soils a number of ways. Firstly, have a look around your neighbourhood. Roadside cut banks, stream beds, or excavations on adjacent parcels will all provide clues as to what you might expect beneath your own. If a well was dug on the property, the drilling log will describe the underlying strata at varying depths.

Ultimately though, the best way to know conclusively what's under the ground at any given point is to dig a hole. To save costs, consider this whenever machinery is on the site for other purposes - like septic inspection or road building. A narrow 6' to 8' deep hole dug in a few spots where you plan to put a basement can save you from backtracking or having to blast later on, and also alert you to the possibility of subsurface water in the vicinity.

Basically, there are four soil qualities you need to be concerned about:

The load-bearing capacity is important for any construction you may plan to do. Bedrock and compacted gravel have the best performance in this regard; loose gravel and sand considerably less, while soft clays and alluvial soils are quite unsuited to normal foundations. Watch also for signs of previous land filling in the area as all building footings must go down to the original undisturbed soil.

The drainage qualities of the soil are important firstly because you need to find an area with good "perc rates" for your septic system. Hard, impermeable soils like clay and hardpan can be problematic because they don't allow snowmelt and rain to be absorbed. This can lead to drainage problems with persistent surface water or runoff.

The angle of repose refers to the ability of the soil to hold a slope and it matters when excavating for roadways or building foundations. Hard rock is obviously the best, holding slopes of 45 degrees or steeper. Wet clay on the other hand will tend to slump to a natural grade of 15 - 20 degrees making it hard to dig in and almost impossible to retain.

Finally, the soil's elasticity is significant when building on slopes because of the tendency of highly elastic soils to "creep" or move downhill with the force of gravity. If your survey indicates potential problems with this or other soil qualities, a geotechnical engineer should be brought in to study the situation and suggest remedies.

Water

The presence of water on your site is of importance equal to soils in the scheme of things. Lots of water almost always means trouble - whether because the water table is very high or because the ground is impermeable - and poses challenges for septic systems, causes wet basements, limits land uses, and even raises the possibility of erosion.

Water cycles are seasonal, with high groundwater levels generally found in the late spring following the melting of the winter snow, and low levels in late summer and early fall. Stream flows tend to follow the water table and many new landowners are surprised (as I was) when their charming spring brook all but disappears by late July, or when an apparently dry patch of pasture becomes a sheet of flowing water in April and May.

Fortunately, if surface water poses a problem on your property, in many cases recontouring the land to redirect runoff away from buildings and yards and into drainage ditches or watercourses can control it. Subsurface water is more of a challenge but providing there is some slope to your land, it is generally possible to dry out sites by using curtain or "French" drain systems that intercept this water upslope from your habitation and drain it away. Nonetheless, know the annual water cycle, and when choosing a spot to place your country home or recreational cottage, try to steer clear of wet areas whenever possible.

Trees and Vegetation

Trees and vegetation, probably more than any other factor, define the look and feel of land but they also act to retain and control runoff, and provide shade, privacy, and protection from wind. Here, your inventory should focus primarily on trees and if you have a fair number, particularly if they are close to your building site, you may want to retain the services of a professional forester or arborist.

The number one concern is whether trees are wind firm. Shallow root systems, recent harvesting in the area, or a pernicious fungal infection called root rot all may cause large trees to be potentially lethal hazards in a windstorm. There is also a risk from forest fire when vegetation encroaches close to buildings. Woods with a large amount of "fuel" - downed trees and branches, leaf litter - should be cleaned up to reduce this hazard. Lastly, think about which trees and shrubs are important, whether for their beauty or their practical value as shade or screen. Select which specimens you would like to retain and mark them clearly so that they are not inadvertently cut or damaged during construction.

Climate and Solar Cycle

Ideally, you will be able to experience being on your land through all four seasons before starting to develop it in earnest. This is because house siting and orientation and the location of outdoor living spaces like decks and patios should be thought out in relation to the type of weather you can expect when you use the property. Winds tend to change direction through the day in summer as well as through the seasons. The sun, as I mentioned in the last article, varies dramatically in its strength and height in the sky between midsummer and midwinter and trees, which provide soothing shade in summer, may obscure winter sun. In the next issue, I will discuss how to site your dwelling to conserve energy and maximize comfort and the utilization of solar energy.

The other major factor is snow. How much can you expect? When does it start and when does it leave? Does it tend to blow and drift over? How quickly is the public roadway cleared after a storm? These observations will be helpful when planning the length and steepness of your access and the connection it makes to the highway as well as the design of your home and its environs.

Special Places

Finally, whenever you are walking around your property you should be on the lookout for its rare or unique places and features. Almost every parcel of land will have something special - a grove of uncommon trees, a patch of trilliums, an old inhabited snag, a nest of songbirds, or a dramatic chunk of bedrock - something of aesthetic, ecological, or other personal significance. This is of course an entirely subjective thing, but I generally favour preserving these special features where possible, and often give them a fair amount of weight when deciding where to locate roads and buildings.

After spending many days on your land through different times of the year, learning its secrets, and preparing your inventory you will quite likely begin to know it at a much deeper level than when you were first acquainted. What may emerge is the "personality" of the land, a sense of what makes it unique, its sounds and smells, the way the light changes through the day. Architects and landscape architects are always striving to understand this subtle language of the site and frequently ask questions like: "What does this site want to be?". When this "Spirit of Place" informs the design and placement of roadways, pathways, and buildings, it is felt that our interventions can actually enhance the existing landscape.



Next issue, we will look at the planning process. Once you have gathered all the information you need to make sense of your property, the next step is to put your ideas for roadways, dwellings, and landscaping down on paper and/or lay them out on the ground.



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