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FUNDAMENTALS OF LAND DEVELOPMENT PART 4

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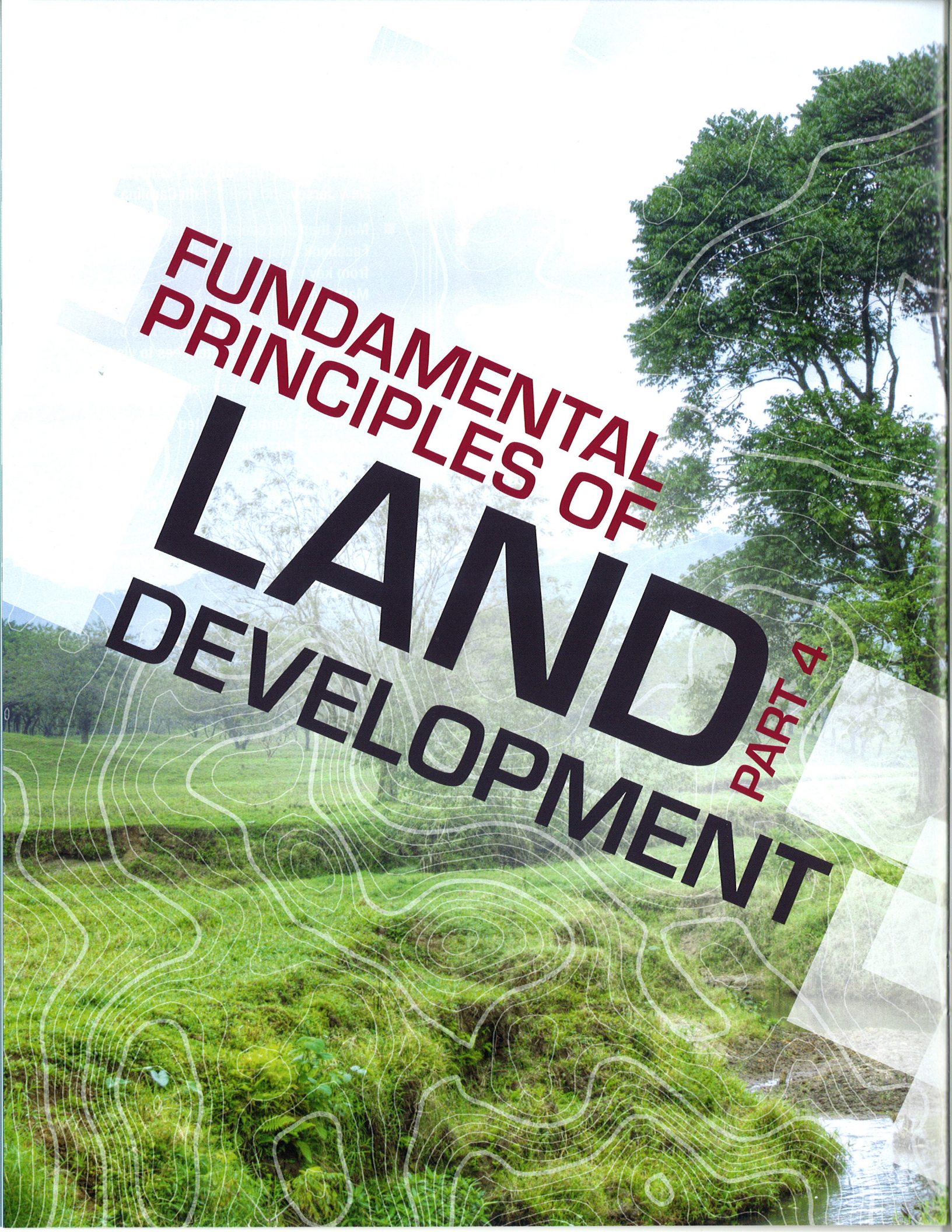
FUNDAMENTAL PRINCIPLES OF
LAND DEVELOPMENT
PART 4

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This is the fourth part of a multi-part series on the fundamental principles of land development and is in conjunction with MBIA's Land Development Council's basic land development course.

WATER COURSES AND FLOODPLAINS

A stream may be a very attractive feature from a marketing point of view, but with every stream there is typically an associated floodplain, which is the area inundated in a given rain storm. Floodplain areas are regulated and generally construction is prohibited within a 100-year floodplain. The State of Maryland requires a permit for construction in most floodplains and will issue the permit if the predevelopment hydraulic characteristics are maintained. Even if floodplains were not regulated, construction in them would be problematic because any improvement within the floodplain is at risk of inundation.

The 100-year storm is the generally accepted standard storm although as the climate changes that may also be changing. A 100-year storm refers statistically to a storm that has a one-percent chance of occurring in any given year. This statistical relationship also applies to other storm frequencies. For example, a 10-year storm is a storm of magnitude that has a 10% chance of occurring in any given year. Likewise, a two-year storm has a 50% chance of occurring in any given year. The width of the floodplain at a particular location is a function of the amount of water flowing to it and the topography on either side of the stream.

For a given amount of water the floodplain will be wider for a shallow stream channel than for one that is deep and narrow. Civil engineers and hydrologists use computer modeling to determine floodplains. The amount of runoff at any given point is a function of several factors including the following:

- Drainage area
- Land Use Characteristics: How much of the site is impervious, grassy or forested–the greater the impervious area, the greater the amount of runoff generated during a storm event.
- Length and Slope of the Contributing Channel: How long is the distance from the highest point in the drainage area to the lowest point in the drainage area and how steep is the grade? The shorter the distance and the steeper the slopes, the greater the amount of runoff generated in a given storm.

Although only an engineering study can compute the precise extent of a floodplain, the Federal Insurance Agency (FIA) of the Federal Emergency Management Administration (FEMA) publish a series of flood maps that are readily available and which give an indication of major areas that are flood prone and within floodplains. Only a floodplain study, however, can accurately determine floodplain limits.

SUBSURFACE CONDITIONS AND SOILS

No matter how attractive a property may look on the surface, its subsurface conditions may render it problematic for development. Soil maps that identify various soils and their development limitations (i.e. poor drainage, depth to bedrock, erodibility, high water) are available from USDA Natural Resources Conservation Service at *https://websoilsurvey.nrcs.usda.gov/app*

A site may be underlain by impenetrable rock or an extremely high water table or it may have been used for dumping. Subsurface exploration (soil borings or test pits) should always be undertaken to determine the nature and suitability of the sub strata. Borings can be prepared or test pits can be excavated with a backhoe at strategic locations very economically. More than one developer has purchased property only to discover old cars and refrigerators buried beneath the surface.

OVERLAY DISTRICTS

Often there are overlay districts in a jurisdiction. For instance, around an airport one might find an airport zone controlling the development within flight paths. Two notable overlay districts of which developers should be aware in Maryland are Adequate Public Facilities and Critical Areas.

ADEQUATE PUBLIC FACILITIES

Baltimore County, Anne Arundel County, and many other jurisdictions have regulations prohibiting development in those areas where certain public facilities are inadequate.

In Baltimore County, the County Council adopts maps of the basic services in the Fall of each year. In Baltimore County, the basic services considered are traffic, sewerage and water and schools. Areas of deficient services are mapped and development is prohibited in them for the duration of the deficiency.

In Anne Arundel County, a development proposal must also have adequate public facilities including schools, traffic, water and sewer and police and fire protection. A development in an area of inadequate facilities can proceed only if the developer corrects the inadequacy.

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CRITICAL AREA

The Maryland Legislature adopted Section 8-1801 et. Seq. of the Critical Area Law. This law defined the Chesapeake Bay Critical Area to consist of "all land and water areas within 1,000-feet beyond the landward boundaries of state or private wetlands and the heads of tide." The Critical Area was divided into three types of development areas: intensely developed areas, limited development areas, and resource conservation areas.

Local jurisdictions are required to identify and map each of the three areas based upon criteria established in the regulation. Intensely developed areas are predominantly comprised of existing development where there is relatively little natural habitat. Limited development areas are those which are currently developed at low or moderate intensities and which contain areas of natural habitat. Resource conservation areas are those areas which are characterized by nature dominated environments. Development is restricted in the critical areas.

ENVIRONMENTAL ISSUES

HAZARDOUS WASTE

The Comprehensive Environmental Response Compensation and Liability Act (CERCLA) better known as Superfund, imposes severe liabilities and risk upon real estate owners. CERCLA defines a long list of toxic and hazardous wastes. The Act applies to anyone with a contractual relationship to a property. In order to protect property purchasers, it is very important to have a Phase I environmental assessment performed by an environmental consultant. A Phase I includes the development history of the property, visual and other analysis to initially determine if it is likely that toxic and hazardous wastes are present. Having completed a Phase I, a property owner can then assert the Phase I assessment as a defense should environmental liability later arise.

If a Phase I indicates the possibility of toxic and hazardous wastes, a Phase II will be prescribed. A Phase II study is a more comprehensive and detailed environmental assessment that determines the presence of CERCLA defined materials. Phase III of this process is the mitigation and remediation of any wastes. Property should not be purchased without at minimum having completed a Phase I study.

FOREST CONSERVATION

Maryland and various local jurisdictions have passed laws requiring forest conservation. Forest conservation requires a forest stand delineation- a study to determine the extent and nature of forest resources. The State Forest Conservation Act mandates that a certain percentage of forest is maintained (known as a threshold) and there is a mitigation requirement should clearing be proposed below the threshold. Also, there is an afforestation requirement that requires a minimum amount of forest even when there is none initially.

The Federal Clean Water Act as well as state and local laws protect wetlands and provide for severe penalties if they are disturbed.

In addition, some jurisdictions like Baltimore County, have specimen tree ordinances requiring the protection of trees of a certain size and sometimes requiring special variances for their removal.

WETLANDS

Wetlands are considered to be highly sensitive and valuable environmental resources. They are classified as tidal or riparian. Typically, development projects encounter riparian wetlands. The Federal Clean Water Act as well as state and local laws protect wetlands and provide for severe penalties if they are disturbed. Prior to undertaking any development projects, if the presence of wetlands is suspected, it is recommended that a qualified consultant perform a wetlands delineation and even if wetlands are not suspected it is still advisable to obtain a cursory review. Under Federal regulations wetlands must have three characteristics: hydrology, hydrophitic vegetation and hydric soils. Hydrology simply means that water is close to the surface for at least two weeks during the growing season. There are certain types of plants that will only grow in wet areas and these are a diagnostic parameter for wetlands. Generally soils contain iron, which gives them a reddish color. When soils are repeatedly underwater, the iron oxidizes anaerobically and the soils assume a dark gray or blackish color. These types of soils are called hydric soils and are identified by their color. To be considered a wetland, a soil sample must have all three characteristics.

Disturbance of wetlands can be permitted under certain circumstances and at the Federal level is under the jurisdiction of the United States Corps of Engineers. There are two types of wetlands permits; individual permits and nationwide permits, which allow for minor wetlands disturbances. The permits are difficult to obtain and the best strategy is to avoid wetlands where possible. When permits are issued, they require avoidance, minimization and mitigation.

HISTORICAL ISSUES

Historical issues can radically affect property development. Among these are gravesites. Historically, backyard burials or small family plots were common and often unmarked or documented. Disturbance of graves can result in hefty penalties and must be avoided. It is very important to reconnoiter a property prior to development. Additionally, some counties require an archeological investigation and many counties have Historic

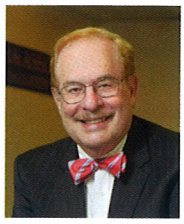
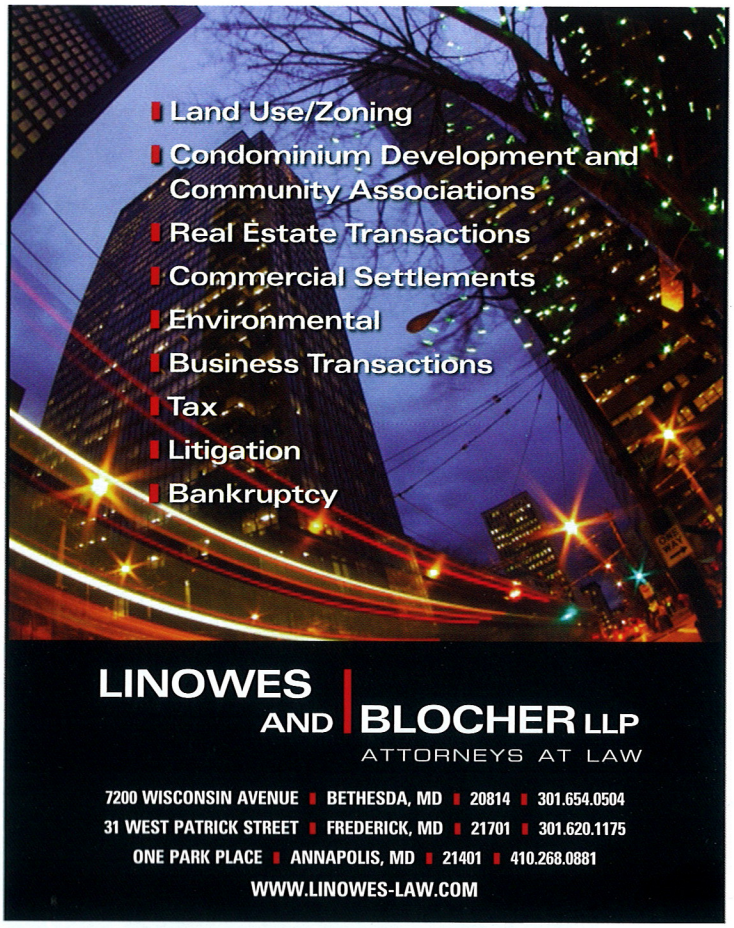
Preservation laws prohibiting development on historic sites, generally but not always more than 50 years old. Sometimes, development will also be prohibited on historic "settings". Most jurisdictions, as well as the state of Maryland, maintain an inventory of historic sites that should be consulted prior to property purchase and development.

TITLE ISSUES

Title issues are an increasingly common problem. They fall into several varieties:

- **Covenants:** It is very common for a property to be restricted by use of a covenant. For instance, a covenant may say that future lots must be a certain minimum size. Covenants are extremely difficult to remove. It's not uncommon, especially in the Baltimore region, to find covenants against certain religious and racial groups- those of course, are no longer valid.
- **Old Roads:** It is also not uncommon to have old paper roads traversing properties. The problem is, every property fronting on the paper road has a non-exclusive right to the road. It's very important to know where these paper roads are even though they may not be visible in the field and to avoid developing on them.
- **Merchantable Title:** Finally, just because you have a deed to a property, doesn't mean you actually own it. A deed is only evidence of ownership and is not conclusive. Failure to possess a good title will affect all future home owners. A title search should be completed as part of any feasibility analysis of property.

Needless to say, the entitlement of raw property while potentially very lucrative, is fraught with physical, regulatory and political risk. One of the most powerful techniques to manage that risk is a thorough feasibility study encompassing the elements that have been presented in this and the prior article in this series. Be sure to read the next article in the July/August issue that addresses the process of development and subdivision approval



David S. Thaler, PE, LS, F., ASCE, F., NSPE is the President of D.S. Thaler & Associates, Inc., a civil and environmental engineering and surveying firm in Baltimore, Maryland, which has designed hundreds of communities. Repeatedly honored, he is a Fellow of both the American Society of Civil Engineers and the National Society of Professional Engineers, and is Guest Scholar at the University of Baltimore School of Law, where he lectures on land use. He has published more than 250 articles and five books, and has won numerous life time achievement awards including Icon of the Industry. He also holds both the highest professional engineering award in Maryland, now known as the Thaler Prize, and the Maryland Distinguished Service Cross, Maryland's highest military honor.