

# INTEGRATING NATURAL RESOURCES INTO A DEVELOPMENT, PUBLIC AND PRIVATE ROLES

## Why?

Integrating natural resources into a development can increase its market value, enhance the quality of life for those who live, work or shop in the development, and contribute to the long term sustainability of the environment, on which our welfare, and that of future generations depends.

Housing is the dominant urban land use, typically accounting for 40 or more percent of the developed land in an urban area. It warrants particular attention for those who want to integrate natural resources into development. Streets and rights of way typically account for 20 percent or more of the developed land in an urban area or development. The proper sizing and design of these corridors also warrant close attention. The principles which apply to these land uses are applicable to commercial, industrial, institutional, and even recreational uses as well. Additional information is available in my papers: Planning for Green Infrastructure; Green Infrastructure and Site Planning; The Power of Numbers, the Benefits of Low Impact Design; and, Creating Sustainable Neighborhoods. They are part of a free e-book, "Readings in Urban Planning and Design" available as a download via [petepointnerplanning.blogspot.com](http://petepointnerplanning.blogspot.com).

To accomplish the objective of effective integration, it is important to understand the motivation and responsibilities of the participants who influence development, the tools at the disposal of each participant, the factors to be considered in the evolution of a site plan and some of the techniques which can enhance the process.

## Participants and their Motivation

### **Federal and State Agencies**

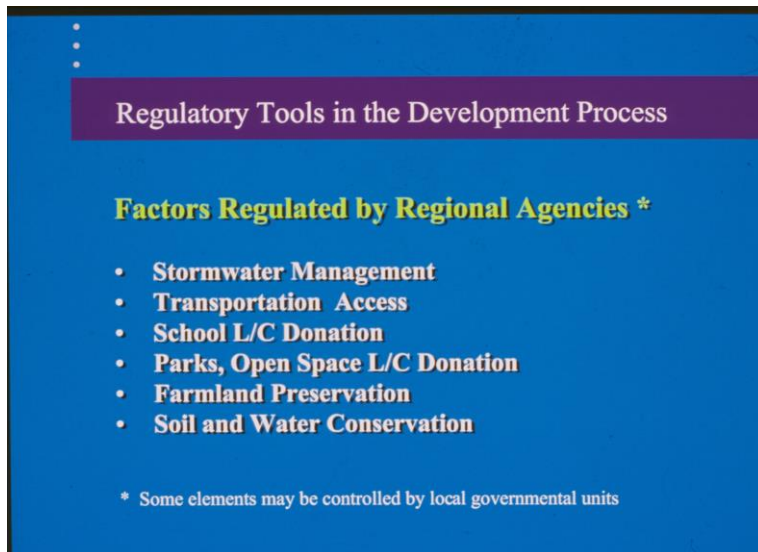
The Army Corps of Engineers has a responsibility to implement Section 404 of the Clean Water Quality Act that requires a permit for dredging or fill in the waters of the U.S. The act also helps to protect wetlands and flood plains. The permitting process activates review by other Federal and State agencies. It is the umbrella of authority under which many natural resources are considered. See Figure 1.



**Figure 1, regulatory tools of federal agencies**

### **County and Regional Agencies**

These agencies set standards and processes which directly impact development, particularly when such standards and/or processes are not set by a local government unit. Each State and County may have different factors which they control but Figure 2 shows typical factors governed by urban counties in Illinois.



**Figure 2, regulatory tools of regional agencies**

### **Local Government**

In Illinois and many states, the real power to influence development rests in the hands of the local unit of government, typically the City or Village or Township within which

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development is proposed. Where development occurs beyond the municipal limit, up to 1.5 miles, the municipality has the right to review and comment on development and may apply some of the standards of their subdivision regulations. See Figure 3. See my previously referenced blog for a Site Plan Review Checklist and paper titled, Ten Habits of a Good Plan Commissioner..



Figure 3, local government regulatory tools

### Property Owner

The property owner starts the development process when they decide to sell, annex or develop their land. The price of the land and the timing of development influence the type and density of a project. If the local government unit controlling the zoning of the property, or the agency processing permits, establishes requirements for preservation and integration of natural resources, it may require the owner to reduce the price of the land because these considerations may influence the density of development that can occur. Reducing the price of the land may be necessary to attract a developer who can “make the numbers work”, i.e., make a profit with the allowable density on the remaining developable land.

### Developer and Builder

The property owner will typically sell to a developer. A developer is the entity who prepares a site plan, processes approvals and implements the infrastructure so that buildings can be constructed. The builder, or builders, are those who construct the buildings. In some cases, the same person or corporate entity plays two or even all three roles. The developer selects the site planning team, determines the type and

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intensity of use within limits set by local government zoning, controls the construction process and implements the mechanisms for preservation of natural resources in the future. If the entity carrying out any of the three roles is committed to integrating natural resources into their development, they can make a significant contribution to the achievement of that objective.

### **Development Team**

The development team must take into account the applicable plans, policies and standards, the characteristics of the site, the influence of connecting to area wide infrastructure, and satisfy the “program” of the developer. Site plans often reflect the satisfaction of broadly established standards with little or no creativity or imagination or reflection of the character of a site. The responsibility of the development team is to meet the standards and satisfy the program within the constraints and opportunities of the site and the other planning factors influencing its capacity.

The challenge is to go beyond routine application of technical skill into the realm of art and values which achieve true integration of natural resources into a development and create added value for all of the participants and for future generations. This requires a professional team. See Figure 4.



**Figure 4, the development team**

### **Regional Market**

Ultimately, plans by both local government and developers must recognize the reality of regional markets. In a rapidly developing region, the challenge for local government is to set high standards and to enforce them in the site plan review and approval process.

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In a depressed market, local governments must resist the temptation to lower standards to get development, at any price.

Ultimately, the details of site planning and design are determined by the local unit of government and the developer. The degree to which the participants are committed to integrating natural resources into development will strongly impact the degree to which the objective is achieved. Motivation, expertise, commitment and perseverance are necessary pre-requisites to quality development.

See Figure 5 for a diagram of the development process.

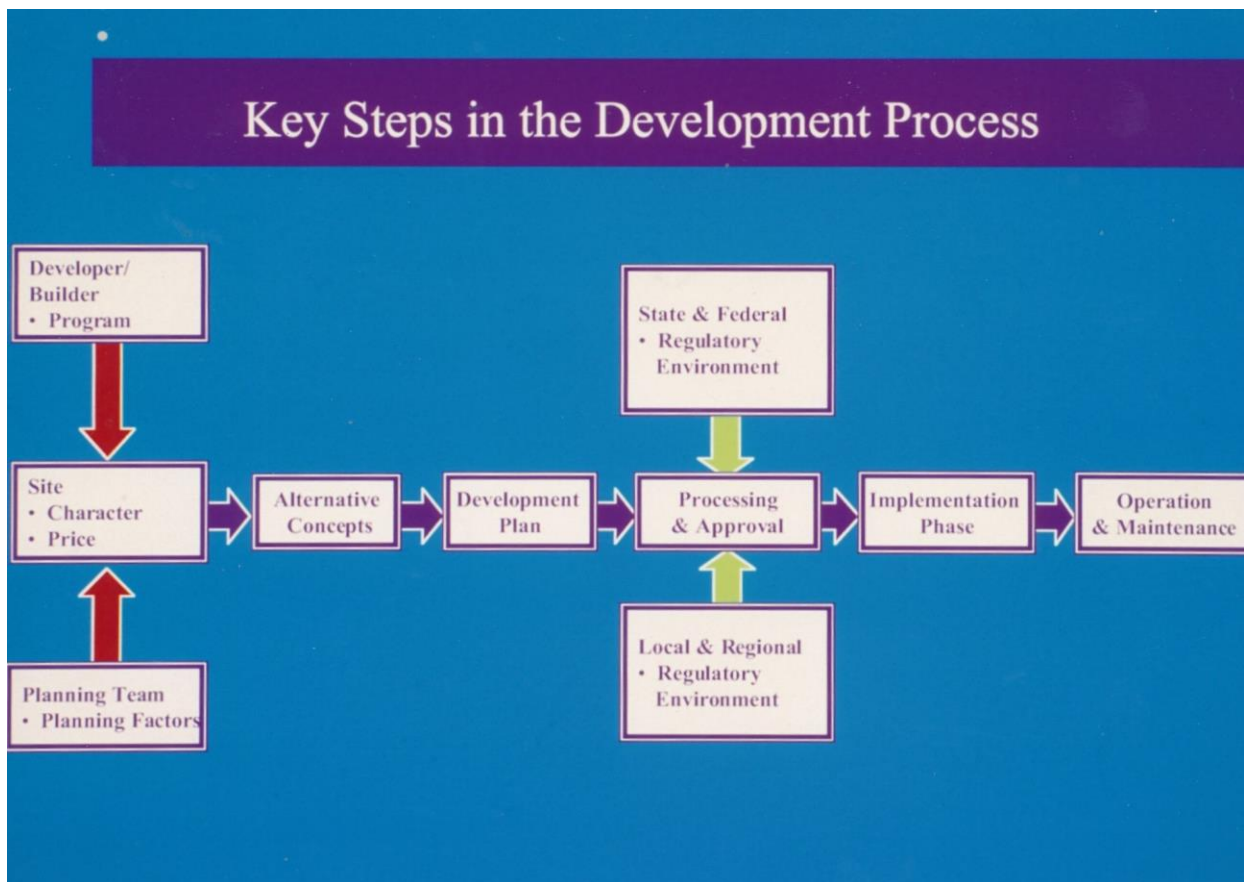


Figure 5, the development process

### Key Steps in the Development Process

#### State and Federal — Regulatory Environment

A permit requirement from the Army Core of Engineers (ACOE) triggers review by the U.S. Fish & Wildlife service and coordination with other State and Federal agencies.

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One objective of this review is to determine if there is evidence of Threatened or Endangered (T&E) species that might be impacted. If there is habitat or breeding areas for T&E species, additional coordination is necessary, possibly requiring changes to, or abandonment of development plans, or incur significant cost of mitigation. Similarly, coordination with the State Historic Preservation Officer is often required to determine if there are any historic or archaeological resources which would be impacted. All of these requirements offer local officials and developers incentives to thoroughly document all natural and cultural resources and to integrate them into the development plan from the outset so that they can enhance the development as well as comply with applicable laws. This avoids even more costly changes after significant investments have been made in basic engineering and planning.

### **Regional Agencies — Regulatory Environment**

There are numerous elements of development for which standards are set by local or regional governments. Two of the most influential functions of government relative to natural resource integration into site development relate to storm water management and to open space dedication. In the first case development will be directed out of flood plain and flood way areas making them obvious opportunities for natural resource preservation as a part of a green infrastructure system. Secondly, forest preserve districts, townships, counties, and park districts are often in a position to purchase areas with unique natural resources so that they are preserved in perpetuity. This may produce income, or tax credits for the developer and/or property owner while creating an amenity which enhances the uses on the remainder of the site. Typically, the dedicated land has serious constraints to some or any development. The most cost effective plan can be the most environmentally responsive.

Factors to be considered include:

- Storm water management
- Connection to transportation systems, roadways, transit, pedestrian and bicycle
- School, land/cash donation
- Parks, open space land/cash donation
- Sewer and water systems or well and septic permits
- Agricultural preservation
- Soil and water conservation

### **Local and Regional — Regulatory Environment**

The comprehensive plan is the policy document which identifies the type and density of development for all land areas within a municipal or county's planning jurisdiction. It

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may establish policies for dedication of open space and environmental corridors and identify future roadway alignments and dedication. It may also recommend the quality and character of development, relating it to the history, and the character of the site and the area. It may also require processing of a development petition as a Planned Unit Development (PUD) for selected corridors or areas.

The subdivision ordinance focuses on standards for public improvements and infrastructure. There are numerous elements which influence the degree to which natural resources are respected in a development. First of all, the subdivision ordinance should note that development should be consistent with the comprehensive plan. Secondly, it should have a functional classification system for roadways. This is described in my paper To Grid or Not to Grid, available on the previously noted blog. For environmental reasons, this system permits local streets with a limited traffic to have reduced rights of way and pavement widths since they have been planned so that their function will not change with growth and development. Third, there should be maximum containment of stormwater within the development site and stormwater management should use natural systems referred to what are referred to as best management practices (BMP) as much as possible. Pavements should be minimized to reduce run off and drainage should be filtered through biological cleansing systems.

Tree Preservation requires a thorough tree surveys (typically, showing the species, grade elevation, location and diameter of all trees over 6 inches in caliper. If significant trees are present they should be considered in site planning, grading and the creation of conservation easements and covenants.

Landscape design should be superimposed on a base showing grading and utility locations, utilize a diversity of native materials, avoiding mono-cultural planting, and incorporating street tree plantings and management procedures to minimize chemical use.

The zoning ordinance is the most significant tool which controls development. Municipalities can enact a zoning ordinance which determines the permitted or “special uses” allowed on any site within its municipal or corporate boundaries. Zoning is a tool for implementing the comprehensive plan. A key component is the planned unit development (PUD) process. This is a “privilege” which can be conferred by a municipality. The municipality may permit deviations from the underlying zoning standards to accomplish a more creative design and provide public amenities not otherwise required. The key is to achieve a public benefit in exchange for relief of the rigid specifications for lot size, width, depth, setbacks etc. Preservation of natural resources and setting aside areas for permanent open space are public benefits seldom achievable by straight application of subdivision and zoning ordinances.

Once a petitioner has submitted a plan for review, it is important that the local

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governmental unit employ an interdisciplinary evaluation equal to, or greater than, the sophistication of the developer's team. Frequently, in the more urbanized areas of Illinois, local government units hire consultants for plan review and charge the costs back to the developer. In this way, the municipality gets the advantage of experienced professionals in ecology, transportation, storm water management, landscape architecture, architecture and land planning at no cost to the tax payers.

There are numerous elements warranting control during the implementation phases of a project. The local government unit plays a key role in the issuance of permits and enforcement of the conditions of project approval. Quality developers will train field supervisors so that they are knowledgeable about the key natural resource preservation, erosion control and mitigation measures. The municipality should require a construction bond to assure compliance with approved plans and procedures. Following acceptance of public improvements, including infrastructure, landscaping, storm water management facilities and wetland mitigation, a maintenance bond should be established to assure the effectiveness of improvements beyond the first year of construction. Note that the ACOE may require monitoring and maintenance of wetlands to assure the effectiveness of the measures to protect, enhance and mitigate wetlands.

### **Site — Physical Environment, and Price**

#### **Program — Developer/Builder**

Under ideal circumstances, a property owner would determine the "best" use of their property, coordinate the preparation of a plan consistent with local plans, policies and standards. The property would then be marketed to developers who agree with the idea of the plan and have a product which fits the plan and the site consistent with market realities. The stereo typical situation, however, is a property owner who sets a high land price and sells to whoever will accept the price. They in turn will push the developer/builder to achieve the yield or density which will permit them to put a product on the market which will sell at an acceptable price point which will achieve their pro-forma and meet their absorption and profit projections.

#### **Planning Factors — Planning and Design Team**

The interdisciplinary team responsible for planning and design of a development should integrate their work so that the evaluation, documentation and utilization of site data results not only in an efficient layout, but one that is artistically creative. The total impact of the plan should be greater than the sum of the inputs from the individual members. Planning factors to be considered in the evolution of a plan include, but are not limited to the following:



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- Topography
- Drainage, flood plains
- Water resources, both surface and groundwater
- Soils
- Flora and fauna including threatened and endangered species, the extent and quality of wetlands and trees over six inches in diameter
- Environmental corridors
- Comprehensive plan, zoning and subdivision requirements
- Political environment, including attitudes about growth, local tax base and school deficiencies, and opinion of nearby property owners and overlapping taxing jurisdictions
- External land uses, and previous uses which may have left hazardous materials or impediments to construction
- Market Influences
- Developer's program which drives density and lot size
- Utilities and easements which may facilitate or constrain preservation of trees or other resources
- Transportation networks, access requirements and constraints, roadway standards, and connections to adjacent parcels and transit, pedestrian and bicycle systems
- Exactions and impact fees

See Figure 6.

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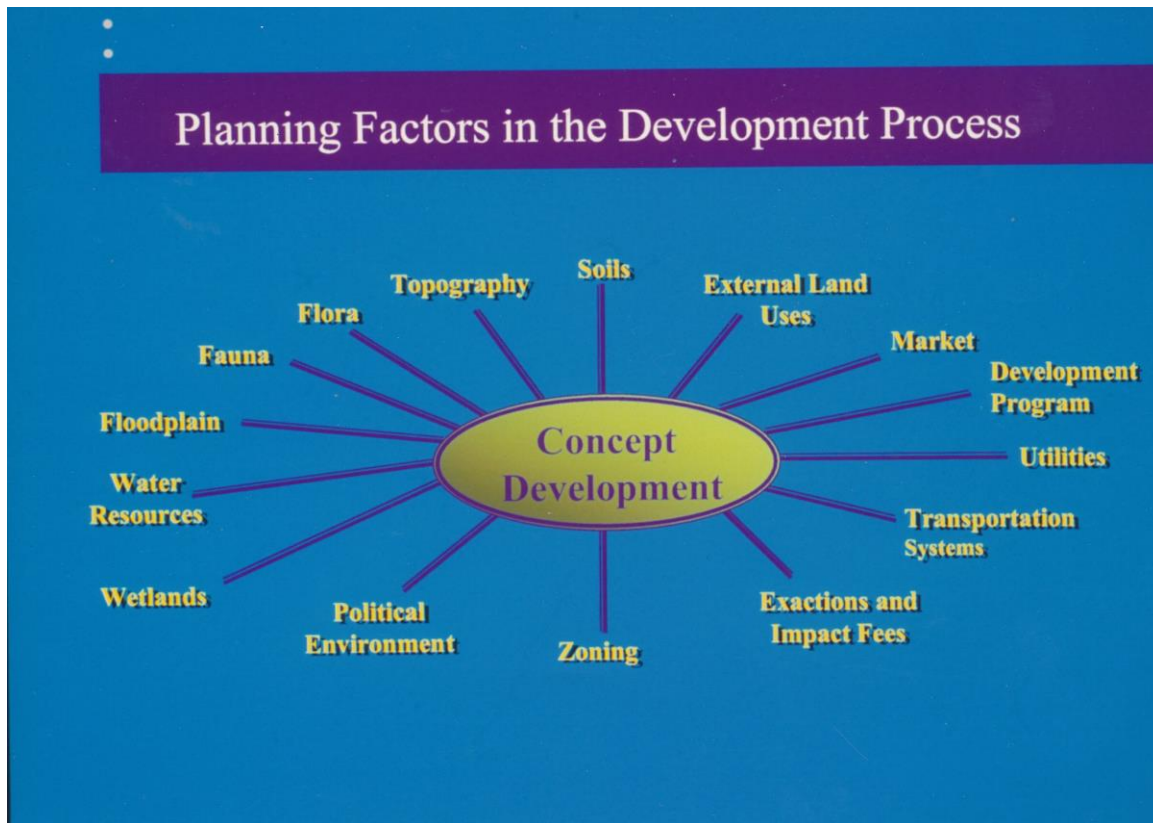


Figure 6, planning factors in the development process

### Processing and Approval

Developers will often avoid a (PUD) process because of vague standards which open them up to exactions not required by ordinances of the local government unit. Such requests may involve significant costs late in the process which jeopardize the financial feasibility of the project. It is important, therefore, to have clearly established standards and policies for processing of a PUD. Administered properly, the PUD process can result in significant public benefit related to preservation of natural resources and provision of open space while permitting the developer more flexibility to produce a creative site plan and achieve acceptable densities with deviations from rigid underlying standards.

One site planning technique applicable to residential PUD's is that of clustering. The premise is to cluster houses on lots smaller than required by the underlying zoning on the land most suitable for development and to preserve the rest in perpetuity as permanent open space. In an open space cluster subdivision, most or all of the units are adjacent to open space which inter-twines and connects all of the lots with each other and to external open space corridors and pathways. See Figures 7 and 8.

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**Figure 7, the Ponds of Kideer, large lot cluster open space development**



**Figure 8, Oak Creek Courts, small lot open space cluster development  
Implementation Phase**

The developer should assure that field personnel are properly instructed and supervised so that tree preservation, erosion control and wetland protection measures

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are effectively implemented. Field checks and measures to enforce conditions of plan approval as well as to implement mitigation measures should be institutionalized and enforced.

### **Operation and Maintenance**

A management and maintenance plan should be adopted and enforced for wetlands and natural areas. It should be developed by qualified professionals with provisions for funding, enforcement and mitigation of any impacts or deviations from the plan.

Covenants and restrictions to assure owner compliance with use and maintenance of their property in accord with preservation of natural areas, particularly in respecting buffer areas. See Figures 9 and 10.



**Figure 9, pedestrian linkage within green belt**

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**Figure 10, well designed and maintained wetland and stormwater storage area**

### **Summary**

In summary, to achieve the integration of natural resources into a development requires:

- Right attitude and values
- Right plans,policies and standards
- Right team
- Right process
- Right site plan and product
- Right implementation
- Right operation and maintenance

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