



# PDP Community Series Blog 15 - Site Analysis

## INTRODUCTION:

In order to determine if a prospective site or sites are suitable for a designated need a site analysis study should be made to establish what assets and liabilities an individual site may have that would affect the proposed development. The first study that should be evaluated is an environmental impact statement for the property. This will normally disclose any problems that the proposed site may have. The seller or buyer may institute the study and this is to be done prior to purchasing of the property. The second analysis would incorporate specific factors

associated to each individual site. These factors should be evaluated prior to the purchase of the property and would include cultural analysis, location, off-site conditions, government regulations and procedures and association with other developments in the area. The third tier of the analysis could be performed after the purchase of the property and would be important in developing design studies. A brief outline for the above site analysis requirements will be noted below and will be used as a guide for the purchasing of any property for development purposes.

## OPPORTUNITY ZONE SITES

After evaluating the sites noted in Blog 15 I am presenting a site analysis protocol that can be used to perform these studies. Other data may be required that is not shown here and that data will be added to this report. The information about Opportunity Zones is an example (Blog 14).

## ENVIRONMENTAL IMPACT STATEMENT

One of the first steps in preparing an environmental landscape plan is to determine what physiographic zone that the site is located in in order to understand the types of landscape and wildlife diversity is in the area. Physiographic regions is defined by the composite patterns of landscape features and represents the product of a host of processes that operate at or near the earth' s surface. As noted in the book "Landscape Planning - Environmental Applications" by William M. Marsh the landscape represents a basic form-function (or process) relationship then we should be able to deduce a great deal about the processes that operate in it from the forms that can be observed. If certain balances exist on a slope among, for example, soils, the runoff rate, slope inclination and vegetation cover, then an alteration of one component without counter in the other three will cause an imbalance. As a rule, the goal in environmental planning should be to guide change in such a way to maintain the long term performance of the critical processes and systems of the landscape. The preliminary impact study should note what changes would have to occur for any specified development and determine if they would cause imbalances that would cause problems at a later date.

In order to understand what processes exist on a site there are many sources that can be used to obtain the necessary information. Some of them are:

- ❖ Field Inspection
- ❖ Secondary Sources
  - Topographic Contour Maps
  - Soil Maps

- Aerial Photographs
- Geological Surveys
- Historical Information and Patterns
- Wildlife and Vegetation Patterns
- Existing Government Regulations and Guides

Some of the topics that should be examined in any Environmental Impact Study are:

- ❖ Topography, Slopes and Land Planning
- ❖ Soils and Development Suitability
- ❖ Soils and Wastewater Disposal
- ❖ Groundwater, Land Use, and Waste Residuals
- ❖ Stormwater Discharge and Landscape Change
- ❖ Watersheds, Drainage Nets and Land Use
- ❖ Stream Flow and Flood Hazard
- ❖ Quality, Runoff and Land Use Soil Erosion, Land Use, and Stream Sedimentation
- ❖ Shoreline Processes, Sand Dunes and Coastal Zone Management
- ❖ Sun Angles, Solar Heating and Environment
- ❖ Microclimate and Urban Environment
- ❖ Seasonal Ground frost (if applicable)
- ❖ Vegetation and Environmental Assessment
- ❖ Wetlands, Habitat and Land Use Planning
- ❖ Review of Carbon Credits for the Site and Federal Standards Review

Analysis of the above information is critical for any large site (over 20 acres) if the criteria for the developer is for sustainable development. It also may save money (for example, Woodlands near Houston, Texas) and prevent construction and environmental problems at a later date. There is also a public relations benefit for sustainable projects, since people are becoming more conscious of these types of developments. The above information also has a direct impact on landscape and architectural planning.

In the book “Regenerative Design for Sustainable Development” by John Tillman Lyle (Cal State at Pomona) noted several strategies for Regenerative Design. Regenerative systems are enmeshed in natural and social processes in ways that make their purposes far more complex than present development schemes. Some of the strategies in the book are:

- Letting Nature do the Work

- Considering Nature as both Model and Context
- Aggregating, Not Isolating
- Seeking Optimum Levels for Multiple Functions, Not the Maximum or Minimum Level for any One
- Matching Technology to Need
- Using Information to Replace Power
- Providing Multiple Pathways
- Seeking Common Solutions to Disparate Problems
- Managing Storage as a Key to Sustainability
- Shaping Form to Guide Flow
- Shaping Form to Manifest Process
- Prioritizing for Sustainability
- The Environmental Impact Statement and Regenerative Strategy applications (where applicable) become the cornerstone of determining if a site is applicable for any proposed development. The pre-planning prior to purchase will take time, but it will be necessary in order to evaluate what would be the most desirable site. The Environmental Impact Study would probably be done by an in country firm where possible, because of their familiarity with the land and having done other studies in the area.

## LAND DEVELOPMENT PROCESS STUDY

There are many other considerations that should be examined prior to the purchase of any property for a major development. Some of these, such as the evaluation of adequate utilities for the entire development (if constructed in phases) may be covered in the Environmental Impact Statement, but will be repeated here to insure that it will be considered. In order to understand the value of pre-planning and site evaluation the **Land Development Process** should be understood. A sample procedural analysis is as follows:

## SITE ANALYSIS

Other information not covered in the Environmental Impact Statement would be considerations pertaining to off-site requirements, coordination, easements and deeds, and other internal site conditions. This would include the following: (Land Development Handbook-Dewberry and Davis)

- Street address, local street maps
- Configuration and area from tax maps and tax records or engineers survey

- Land ownership records
- Chain of title traced back to creation of tract boundaries or adoption of subdivision regulations
- Deed conditions, restrictions or covenants that could affect future use
- Prior recorded plats including boundary adjustments
- Records of easements appurtenant showing purpose and owner of easement
- Public road frontage and property access information-maintenance responsibilities?
- Adequacy of public road frontage for future traffic required for the proposed development
- Review of road standards (ROW-construction detqils-drainage-grade-maximum cul-de sac length-sufficient spacing for multiple road entrances)
- Research into previous uses to determine underground structures and any contamination
- Information on adjacent properties (ownership-land use-comprehensive plan requirements)
- Probable off-site easements required for road and utility construction

Project vicinity and market area information include the following:

- Location and proximity of major travel and commuter routes both existing and planned
- Completed construction dates on any planned routes and other facilities
- Proximity and travel time to employment, retail uses and distance to proposed labor market
- Proximity to cultural facilities, schools, parks, police and fire stations
- Characteristics of nearby developments, quality and price range.
- Image of surroundings for travelers coming from the airport or other developments

Planning, zoning and related development information

- Review relevant comprehensive plan and zoning maps and texts from city, town, province or county, state and federal agencies. These include growth management ordinances, adequate public facility ordinances and standards, proposed fees and payment schedules, and any growth restrictions. Review park and recreation standards.
- Current property zoning and proposed zoning. If land is purchased within a larger development tract review the restrictions for the entire property. Is property split by zoning boundaries. Is there any new zoning applications pending on the property?

- Do requirements for zoning overlay or special districts apply, including transfer of development rights and resource protection. What are taxes on the property and time of payments?
- Review comprehensive plan requirements for the site in regard to density or allowable land use
- Review pertinent building requirements of the zoning ordinance including density, height of buildings, setbacks, off street parking requirements, minimum lot sizes, lot coverages, etc.
- Review any pending changes in the comprehensive plans or development regulations and will these have any effect on obtaining building permit approval and/or new public hearings?
- What grandfathered or vested rights may be jeopardized by the proposed development?
- Review development history of the site or development
- Review subdivision and other ordinance regulations peculiar to the site, such as environmental protection and dedication, tree preservation requirements and planting
- Aircraft flight patterns and noise contours

Important physical information, to be identified from aerial photos, and available maps include the following:

- Site topography including streams, swales, ridges and similar landforms as well as any drainage to the property from adjoining properties
- Soil information including types and characteristics. May need soil tests
- Location of wetlands and other sensitive environmental areas
- Large trees and areas of vegetative cover
- Indications of existing easements or proposed easements from utility companies
- Existing structures and use, paved areas and fences
- Encroachments of structures from adjoining properties
- Unusual on-site and adjacent features, such as cemeteries, railroads and historic properties
- Existing roads and determination of minimum spacing between intersections
- Presence of landlocked properties adjacent to the property that may require access
- Earthquake or hurricane potential and exposure
- Information on underground springs, streams or high water tables - salt inclusion

Inventory information concerning sanitary sewer includes the following:

- Agency with ownership and approval authority

- Sewershed in which the property lies; available capacity, projected demand and local restrictions concerning sewer allocation
- Location, size and depth of and to existing lines
- If not on site or adjacent the distance to appropriate connections, means of access, need for easements. Time frame to complete connections to build on the property
- Responsibility for extension and improvements and current timing of public improvements; potential for reimbursement from public or private funds, such as other developers
- Gravity versus pumped versus pressure flow versus packaged treatment plant
- Interference of system construction with other utilities
- Pro-rate fares or assessment fees
- On-site disposal issues, including treatment method, soil suitability, drain field and lot size restrictions, depth to rock and type of rock, impact on project density or lot size, comprehensive plan and ordinance considerations, depth to water table; spot percolation tests may be required
- Availability of appropriate construction materials and systems in the area and review of cost factors of the materials and systems

Information concerning water distribution for service and fire flows includes the following:

- Agency(s) with ownership and approval authority
- Size, location, and depth of to distance to existing water mains, means of access and need for easements
- Water quality, quantity, pressure, and necessary corrective measures
- Responsibility of extensions or improvements, associated fees; timing of public improvements
- Requirements for fire hydrants, water supply and distribution requirements for fire flow
- On-site well information, including depth to water table, groundwater quantity, water quality, plan, impact on project density or building uses, proximity to buildings and septic systems and other ordinance requirements. Test wells may be required
- If on the coast information on salt water intrusion
- Review of possible pollution of available water sources
- Estimate of proposed water needs for the development

Information concerning storm drainage includes the following:

- Agency with ownership and approval authority
- Drainage basin and watershed within which the property is located, unique restriction or conditions applicable to development
- Description of on site drainage patterns
- Location of or plans for regional storm water management facilities, timing of public improvements
- Location of plans for regional storm water management facilities, timing of public improvements
- Existing flood plains from local jurisdiction - Use government reports
- Potential for flooding when stream or rivers are present or near the property. Note if small streams or swales not flowing continuously throughout the year may still be needed to be analyzed for flood capacity
- Probable locations and sizes of culverts and outfall improvements due to increased runoff from development. Review swale requirements next to roads
- Downstream problems with drainage; downstream complaints
- Requirements for detention and retention ponds for storm water management
- Adequate outfall (easements) and ownership of existing structures
- Location, size and depth of existing pipes
- Requirements for non point pollution control and "best management practices"

Information concerning other public or private utilities and services and general requirements that are essential components of the development should be obtained as follows:

- Current and projected levels of service. Are improvements budgeted, is timing compatible with the project, can timing be advanced?
- Service areas for energy and communications utilities, such as electric, gas (natural or propane) cable and telephone. Are there competing companies serving the same area? If so, are rate structures and builder incentives comparable?
- Responsibility for design, upgrade, connection
- Consideration for required easements. Who will obtain?
- Connection fees; when must they be paid?
- Electric, telephone, and cable undergrounding requirements; on-site, adjacent, and off-site responsibilities and contributions
- Availability, proximity, and planned improvements of emergency services, such as police, fire and rescue
- Information regarding the provision of trash removal and street disposal, street cleaning and similar services. Are services public or private, are there alternative providers? If

trash removal is public is it available to condominiums and commercial operations? What is the availability for private contractors for these services?

- Location, proximity, of planned improvements of elementary and secondary schools, and means of access (pedestrian, school bus, public transit). Do sidewalks and trails exist between sites and schools, and will interior sidewalks be required for development? Where are the locations of universities near the site and what is their curriculum?
- Requirements and responsibility for installation of street lights
- What are the requirements for sewage effluent quality from the treatment plant if the purchaser plans to do this on site and not connected to city services? Would this be allowed?
- If the purchaser has new means of providing utility services (alternative energy, self-contained electric generation capabilities, sewage systems, etc. can they be used in the development. Can wind turbines be used?
- What are the laws concerning wages and are there minimum pay scales required? What are the laws concerning the firing of employees? Is there a labor market near the site or would public or private transportation be required to bring people to the area?
- Is there laws as to what equipment and products can be imported into the country? What products are affected by tariffs or other custom requirements?
- What are the laws and restrictions pertaining to the importation of agricultural and nursery stock?
- Can pets be brought into the country and what are the restrictions?
- What are the labor liability regulations, driving requirements, work visas, etc.?
- Are there areas of historical significance or endangered species that have to be protected that would halt or change development activity?
- Can adjacent property be purchased or will it be for sale at a later date that could be helpful or a detriment to the proposed uses? Is additional access proposed or required through these properties?
- How long will it take for fire and police to get to the property?

In many instances the above data and site analysis is too involved to meet time requirements for the developer. An abbreviated approach would be to include the following factors:

- Identification of proper zoning or the ability to rezone
- Location and adequacy of utilities and essential services
- access and site visit (Field Inspection)
- Topography, soils, environmental and sensitive features - defining the usable are

Another use of site analysis is noted below;

## **SITE ANALYSIS - PROGRAM 2**

Site context study, streetscape character study and opportunities and constraints study Many different types of developments will require you to prepare documentation that considers a site analysis. A site analysis is an opportunity to better understand your site and identify the opportunities and constraints afforded by its features. The analysis should include ways that your proposal can be configured and oriented on the site to provide amenity while minimizing impacts on neighbors and the public realm.

When the analysis is required

If a development requires the submission of a Design Response Report, the site analysis will need to be documented and submitted as supporting documentation with the development application. These records will help us to understand the initial design considerations. The amount of documentation required varies depending on the type and scale of development.

The Analysis

The site analysis comprises a site and context study and an opportunities and constraints study. In some locations, a streetscape character study may also be needed. Examples of a site and context study, opportunities and constraints study and streetscape character study are in the Development Application Guide Books. The site and context study helps with identifying the planning controls, physical features and character of your development site. It will also help you to understand potential constraints and opportunities and establish if there are any impacts on neighbors and the public realm. The opportunities and constraints study highlights the potential of your site in meeting the requirements of your brief and budget. There are three main aspects to consider:

- on-site conditions – how the development could be best located on the site;
- public realm interface – how the site relates to the streetscape and public realm; and
- amenity impact – how the development could impact on your life and your neighbours.

The streetscape character study is an analysis of the existing and future desirable streetscape. Developments that are located in a Streetscape of Significance, on the Heritage Register, streets with mature street streets, and significant or complex developments need a streetscape character study.

Prepare the documents

The owner or government agency may have an outline which shows what analyses are needed for different types of development. The outline would explain the full requirements of each part of the analysis.

The analysis will result in your design concept. The concept plans should show the full scope of your proposal in a preliminary form to ensure that people you consult can understand the impact of the development. Your design concept should show:

- the scope of your development in a site plan, floor plan/s, elevations and sections where the scope of the development is complex;
- landscape planning where elements of the landscaping are used to screen views; and
- how you have addressed issues raised by adjoining neighbors.

At this stage you may wish to discuss your design concept with a government authority. We can advise of how to progress to preparing a development application. In most cases the main part of the environmental impact study would be done in country

## FIELD INSPECTION

During the field inspection of the site there are many considerations that should be evaluated and placed on a base map prior to the beginning of any planning. If there are any problems noted, then government or private records should be reviewed to see if and when these conditions occurred (if any record at all). These are:

- Streams, swales, washes, and evidence of confined running water. Lakes or ponds.
- Ridges and obvious drainage divides with nearby ponding or running water/springs.
- Flood plains, often evidenced by high water marks on shrubs, trees.
- Evidence of pollution or sedimentation in running and standing water.
- Conditions of streams, valleys, banks and shorelines
- Marshes, swamps, wetlands, bogs, wet and soggy areas noted by types of vegetation
- Areas and types of vegetation. May need to locate specimen trees at a later date
- Presence of fish and wildlife and evidence of animal habitat.

- Cliffs and other unusual landforms indigenous to certain areas of the country
- Areas of steep slopes, noting vegetative cover
- Evidences and sources of erosion and slope instability
- Locations where there should be borings made to determine soil and geological information
- Evidence of strong prevailing winds
- Existing pilings and retaining walls
- On waterfront property, piers, moorings and other waterfront uses, Observe any shoreline erosion or other problems caused by wind, excessive wave action etc.
- Rock outcroppings, which may cause problems with road excavation, utility trenching, water absorption, etc. May also be used as major points of interest.
- Record view lines to prominent features (water, lakes, wooded areas, oceans) and general spacious views if on higher levels. Does vegetation have to be cleared to enhance views?
- Condition and location of culverts, outfall channels and any existing drainage pipes and swales
- Location, use and structural conditions of buildings, paved areas, wells and any other man made features
- Evidences of cemeteries, burial grounds, and historical uses
- Evidence of community use of property, squatters, which may be evidence of potential community opposition to the proposed project. If squatters are on the land to they have any legal rights to stay on the property?
- Character, use and condition of adjacent properties. Would these be of detrimental use to the proposed use of the property?
- Current construction activities on or near the site. If it is a parcel in a larger development how long will it be for the parcel to be available for construction?
- Evidence of noise, smoke, dust, odors, light intrusion or other activities from sources within the site of nearby uses such as industry, highways, railroads, commercial uses, etc. Prevailing winds should be considered in measuring their impact. Can walls and landscaping be used to reduce impact from any of these nuisances?
- Evidence of any trash, debris, chemical dumping and growing of illegal drugs
- Evidence of any unusual odors that may suggest natural decay or sensitive environmental features or ground contamination
- Sight distances from hills and curves adjacent to the property and proposed entrance locations
- Traffic congestion on adjoining roads and nearby intersections

- Conditions of surrounding roads and pavements including paving and shoulder stability and widths, road side swales, curbs and gutters. Location of nearby opposing driveways and road intersections
- Determination of best materials that are available for construction of roads and buildings.
- Location of overhead utility and power lines
- Evidence of underground tanks or lines, manholes, vents, etc.
- Possible locations of individual and clusters of buildings, internal roadways, and open space areas, trying to visualize the development. Record existing and potential means of access to areas separated by deep swales and ravines.
- Establishment of a separate cultural map or observation list that would affect the potential design and uses within the proposed development
- Take photographs and note direction and where taken on the site map for use during the design phase and establishment of the site condition map
- Determine if an overlay site condition/environmental map is required

## SITE VALUE MAPS

The site analysis and field inspection data should be put on separate maps. They should also relate to the information in the Environmental Impact Study. The maps may also be in overlay forms with each of the environmental or structural categories on a separate overlay. This can easily be performed with a CADD system and makes it easier to understand how the different elements affect the site. This is also an excellent process for determining land values for specific project sites by showing usable land for development, view lines, slopes, vegetation, utilities, etc. The first step in the design of a site value map would be to list many of the items noted in the site analysis study and intrinsic (belonging naturally) values developed by everyone that would add value (or subtract value) from the land. Certain values or conditions would have a more important impact on the site than others, so a rating system depending on their importance to the project. For example, the amount of building area available at average development cost would have a higher value than the amount of area on a slope that would cost much more to develop. However, this could be compensated for by a spectacular view from the building on the slope (or the building of tree houses which require a slope). Another example would be the need for rezoning. In this instance the property would have to be rezoned (if possible) and this would take time that the purchaser would not have the inclination to wait for unless the property had too many other good merits that it would be worth the time to do so. The values could be very subjective or complex and many of them would vary according to the values established by the person or people analyzing the site map. Its main value would be to have the site

studied from many different aspects by different people. For example, the administrator of a hospital would have different values than the building contractor or developer as to the cost of certain facilities.

There is also a question as to the value of ambience (surroundings or atmosphere of a place) from different areas on a site. This should also be compared to other sites or competitive sites or other developments of the same type. The solution is being innovative, unique and attentive to the trends in the marketplace while maintaining proper costs for the project to be successful.

The cost of land is only one component to the value of a property. Other factors include:

-  Appraisal value and comparison to other like projects (if possible) - Site visitation
-  Costs of off-site improvements required - Adequacy of utilities
-  Infrastructure contractor for the site development (Variables in price and reputation)
-  Allocation of share of costs if other properties border the access street
-  Association with other development in the area - uniqueness of the site
-  Market analysis to establish value of the property - inartistic values of the site - views
-  Cost of improvements due to site conditions - Approval time frames

## SUSTAINABLE SITE DESIGN

Now the topic of sustainable site design is becoming more important and many new developments are trying to use sustainable practices incorporated into their site designs. This is comprehensive since it encompasses the ecological, social and economic issues of a project. The general definition is that sustainable development is a development that meets the needs of the present without compromising the ability of future generations to meet their own needs. This involves site and place-focused solutions and employs complex, integrated, and multifunctional systems that must be developed in collaboration with multiple disciplines. (Landscape Architecture Graphic Standards)

One of the factors leading toward this objective is to build a complete consulting team at the onset consisting of several disciplines. The first step is to understand the bioregional and cultural systems as expressed in many Environmental Impact Statements. The environmental considerations have already been noted and the cultural analysis should incorporate:

- An analysis of current land use patterns to determine how people use land around the site.
- An inventory of existing structures noting potential for reuse
- Identification of historical or cultural features of the site and the surrounding region
- Applicable data on the human population and economic setting in the region around the site
- Interviews or meetings with project users, project staff, community groups, and other stakeholders in the project
- Review social literature that is available and visits to local universities to see if students and/or professors would be able to act as survey takers and consultants
- Work with cultural anthropologists/geographers to determine how to recognize cultural design features in the existing architecture and the reasons for existing building locations in urban and rural areas
- Review special holidays and festivals
- Establish a citizens committee to work with project development of the staff housing community
- Set up training for stakeholders in the practices of sustainable design
- Identify sustainable design information resources and manage information for future use

The list of consultants for sustainable design can be varied according to the size, location and type of project. The first team or consulting group would be for the preparation of the Environmental Impact Statement. In the preparation of the first phase of the master plan the following team members could be present to insure all disciplines can interact to produce the best design product.

- \* Land Planner and associates
- \* Ownership Team
  - Owners or representatives
  - Attorney
- \* Construction contractor - Infrastructure
- \* In country architect, engineers and others as necessary
- \* Water management consultant
- \* Architect
- \* Landscape Architect
- \* Engineers - Power - Electrical - Water Storage - etc.
- \* Marketing Consultant

At a later date during the design process (or initially) the following consultants may be needed:

- \* Geographer or Cultural Anthropologist - Normally from in country
- \* Biologist and Environmental Impact Statement Team - Building and Landscape Maintenance
- \* Association of professionals from local or U.S. universities in appropriate disciplines

## SUSTAINABLE DESIGN - LEED PROGRAM

The following criteria is patterned after LEED requirements for sustainable site design. These may be needed to be updated. Headings are used, but other information is available that goes into additional detail. The original LEED system is designed to guide high performance commercial and institutional projects. It has also been applied to schools, multiunit residential buildings, manufacturing plants, laboratories and other building types. Registered projects can choose from a variety of sustainable strategies and earn points toward a certified project in the following six categories:

- Sustainable Sites (up to 14 points)
- Water Efficiency (up to 5 points)
- Energy and Atmosphere ( up top 17 points)
- Materials and Resources (up to 13 points)
- Indoor Environmental Quality (up to 15 points)
- Innovation and Design Process (up to 5 points)

There are other categories that are applicable and the following refer mainly to site design other than (ND) Neighborhood Design. Projects can be certified at a variety of levels based on the points they have earned, as follows:

- Certified (26 - 32 points)
- Silver (33 - 38 points)
- Gold (39 - 51 points)
- Platinum (52 - 69 points)

## Principals and Strategies of Sustainable Design



### Employ Process and Project Delivery Techniques to Facilitate Implementation of Sites

- Include a broad range of stakeholders in the project planning and design process
- Educate stakeholders about sustainable design
- Establish consulting teams early and include the entire team in goal setting early
- Identify sustainable design information resources and manage information for future use
- Establish criteria for decision making early in the process
- Include contractors in the design process, and educate the construction team about sustainable goals
- Document sustainable design goals in the contract specifications



### Design for Healthy Site and Regional Systems

- Select and develop appropriate sites
  - ✳ SS credit 1: Site selection
  - ✳ SS credit 2: Development density & community connectivity
  - ✳ SS credit 3: Brownfield redevelopment
- Understand regional systems and analyze the impacts on the planned site development on these systems
- Inventory and analyze natural and cultural features of the site



### Minimize Site Disturbance

- Protect existing features while surveying
- Protect existing features during construction
  - ✳ SS Prerequisite: Construction activity pollution prevention
- Minimize site development footprint and develop density
  - ✳ SS credit 5.2: Site development, maximize open space
  - ✳ SS credit 4.4: Alternative transportation, Parking capacity
- Reduce negative impacts of roads and parking areas
  - ✳ SS credit 5.1: Site development, protect or restore habitat



### Preserve and Restore Natural Site Features and Habitat

- Preserve or restore wildlife habitat, reduce lighting pollution
  - ✳ SS credit 8: Light pollution reduction



### Protect and Restore Soil Health and Fertility

- Minimize soil compaction
- Minimize grading and earthwork
- Control erosion and sedimentation
- Conserve or restore native soil fertility



#### Protect and Restore Appropriate Native or Adapted Vegetation

- Inventory existing site vegetation and understand regional native plant communities
- Protect existing native and adapted vegetation
- Use plant material appropriate to the ecoregion
  - ☒ SS vegetation credit 5.1: Site development, protect or restore habitat
- Use a diverse plant palette
- Use structural soil to promote tree root growth under pavement



#### Conserve and Protect Water Resources

- Conserve, harvest, and reuse fresh water
- Specify low water use or drought-tolerant plants
  - ☒ WE credits 1.1 and 1.2: Water efficient landscaping
- Use efficient irrigation systems
  - ☒ WE credit 1.1: Water efficient landscaping
- Use rainwater collection systems and reuse gray water in the landscape
- Encourage groundwater recharge through on-site infiltration strategies
- Respect natural drainage patterns
- Minimize impervious surfaces and make paving permeable
- Slow runoff, and employ surface drainage strategies
  - ☒ SS credit 6.1: Storm water design quality control
- Protect, treat, and restore water quality
- Reduce water pollution
- Avoid building products and materials that contribute to water pollution
- Minimize use of applied landscape chemicals
- Treat wastewater on site
  - ☒ WE credit 2: Innovative water technologies



#### Minimize Resource Use and Reuse Materials

- Minimize construction and demolition waste
- Reuse existing structures
- Use resource-efficient, durable, and low maintenance materials

- Specify materials with reuse potential
- Use salvaged and reused materials
- Use recycled-content materials
- Use renewable materials
- Use certified materials
  - ☒ MR credits 1.1, 1.2, and 1.3: Building reuse
  - ☒ MR credits 2.1 and 2.2: Construction waste management
  - ☒ MR credits 3.1 and 3.2: Materials reuse
  - ☒ MR credits 4.1 and 4.2: Recycled content
  - ☒ MR credit 6: Rapidly renewable materials
  - ☒ MR credit 7: Certified wood



#### Minimize Energy Use

- Design landscape features to conserve building energy
- Design site plans for energy conservation, orient buildings to take advantage of solar and climatic conditions
- Use low embodied energy materials
- Use local materials
  - ☒ MR credits 5.1 and 5.2: Regional materials
- Minimize use of operating energy or use renewable energy sources
- Minimize use of power equipment for maintenance and construction



#### Minimize Impacts to Air and Atmospheric Quality

- Reduce heat island effects
- Minimize paving and increase shade
- Build green roofs
- Reduce air pollution
- Avoid building products and materials that contribute to air pollution
- Design to promote alternative transportation
  - ☒ SS credits 4.1, 4.2, 4.3 and 4.4: Alternative transportation
- Reduce light pollution
  - ☒ SS credit 8: Light pollution reduction



#### Protect and Foster Human Health

- Use low and emitting materials and products
- Avoid products that contain persistent biological toxins
- Design for safe and secure environments
- Design for pedestrian and non motorized vehicles

- Connect people with nature and natural materials



#### Manage and Maintain Sustainable Landscapes

- Consider maintenance during design
- Establish management structures, and include maintenance personnel during the design process
- Make a maintenance plan or manual
- Monitor landscape system function during post installation
- Employ appropriate maintenance techniques

## OTHER CONSIDERATIONS

In the preparation of the site design from information obtained there are other aspects that should be evaluated to see if they would be pertaining to the site in question. Some of these are:



Applying Visual Resource Assessment for Highway Planning



Historic Landscapes



Review and Establishment of Cultural Districts



Crime Prevention Through Environmental Design



Site Security Planning and Landscape Design Criteria



Review of the Traditional Neighborhood Design Concept



Transit Oriented Development



Runoff Control Management



Water Supply Systems for Irrigation Water Conservation



Water Distribution - Road Alignment



Storm Water Quality Control



Stream Restoration



Wetland Preservation



Landscape and Landscape Nursery Management and Maintenance

The above study was prepared and assimilated by George R. Hunt & Associates, 341 Birchwood Drive, Garland, Texas, 75043, Phone: 972-279-0204 to be used as a guide for the site analysis of properties that would be used mainly for community development uses. Just parts of the requirements listed is applicable to any project.

