

Land Disturbance and Land Preservation

Report by
Columbia and Boone County Environment and Energy Commission
May 28, 2008

This report has been created as a response to a request from the Columbia City Council to the Columbia and Boone County Environment and Energy Commission (EEC) to investigate Land Disturbance and Land Preservation issues. The intention of this report is to summarize some of the issues and short comings of current ordinances that have caused citizens of the City of Columbia to voice their concern over property developments in recent years, as well as to provide a solid positive direction in updating and developing the City's ordinance's to correct problems and short comings.

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I. Executive Summary

Goal:

Develop a comprehensive plan to update Land Disturbance, Land Preservation and Zoning Ordinances that will provide the tools and resources to the City leaders and City staff to ensure that future growth is both environmentally and economically sustainable. These changes should not only take into consideration the property rights of land owners that want to develop their property, but also the rights of adjoining land owners and the community as a whole, as well as the future generations that will inherit the property and potential problems of poor decision making.

Recommended Actions:

1. First and foremost this report should be viewed as a draft from the EEC and it should be expanded on by a collective of city and county stakeholders (See Section X. List of Stakeholders). Finalization of this report addressing all issues and identifying potential solutions should include the formation of a working group as well as offering public forums.
2. Address immediate issues in land disturbance/preservation ordinances. A preliminary list of current issues that need to be addressed and some short-term solutions are presented in sections IV and VIII.
3. Develop a Green Infrastructure Plan, based on community input, that will provide a framework for clear and fair Land Preservation and Land Disturbance ordinances that will both preserve and enhance Columbia and Boone County resident's quality of life and economic well being. The Imagine Columbia Visioning report contains significant recent input from the community on these issues and therefore should be considered a basis for the development of any new Green Infrastructure Plan.
 - 3.1. Support for an Urban forestry plan has already been requested from Council by staff and EEC. This plan will be an integral part of an overall Green Infrastructure plan.
4. The City of Columbia and Boone County should work together to develop ordinances that mirror and complement each other to ensure that future development is done in the most economically and environmentally sustainable manor.
5. In considering all actions EEC encourages the council to insure that any plan include the following parts:
 - 5.1. Education: An annual education workshop should be established that includes a review of the land preservation ordinances and zoning ordinances, Best Management Practices, and a review of new sustainable development methods. This workshop should be targeted to the City Council, City staff, planning and zoning, and the development and engineering community.

- 5.2. Engineering: A list of best management practices that meet the requirements of the ordinances should be developed and included in the ordinances to provide more prescriptive language that ensures that the intent of the ordinances are carried out.
- 5.3. Encouragement: In any community it is always best for stakeholders to want to do the right thing. Clear information and education should be provided to facilitate and encourage compliance with ordinances.
- 5.4. Evaluation: An evaluation process should be established, where City staff inspects development sites to collect data on the progress and effectiveness of measures implemented for the purpose of land preservation, tree preservation, erosion control and stormwater management. Each year this data should be compiled and presented in an educational format identifying good and bad practices and shared with City Council, City staff, planning and zoning, and the development and engineering community.
- 5.5. Enforcement: Currently the Land Preservation and Land Disturbance ordinances lack any significant penalties for failure to meet the requirements. This issue needs to be addressed to provide enforcement capabilities within the Protective Inspection Department of the City of Columbia.

II. Introduction

Land Disturbance and Land Preservation issues are becoming a serious concern for both City and County residents. We live in a community that values quality of life along with economic viability. As our community has undergone strong growth a tension has arisen between development and the desire to preserve natural resources that are considered an integral part of the quality of life enjoyed in Columbia and the surrounding region. As in any issue a balance will have to be reached between sometimes competing points of view.

In our community people rely on infrastructure all around them. They drive to work and school on roads and expect electricity, water and sewer in their houses. They also come to rely on the park where they go after work and the trail they ride their bike on, or the woods they walk through, or just enjoy driving past. It is all part of the infrastructure that citizens rely on. This infrastructure is sometimes clearly provided by the municipality for it's citizens. In other cases, such as a neighborhood woods or the beautiful wooded buffer around a business or development, it might actually be private land that just has not yet been developed. The EEC was asked to look at Land Disturbance and Land Preservation in the context of a series of recent developments where citizens, neighbors, the Planning and Zoning Commission and the City Council, questioned land use practices. Concerns were raised both in terms of offsite environmental impacts and a more general sense that some community standard for preservation of natural resources had been violated.

Offsite Environmental impact of a development can be partially addressed as an engineering problem. Does a proposed land disturbance affect the neighbors and streams around it? Columbia has recently enacted a storm water ordinance that attempts to proscribe practices that minimize such offsite impacts. The performance of this ordinance and others that proscribe allowable offsite impact from development will need to be monitored for actual performance and effectiveness as has been laid out in the CH2HILL City of Columbia Stormwater Utility report^{6,7,8} that has been presented to the Council. The full evaluation and oversight recommendations of the report should be implemented. Over time the effectiveness of these offsite environmental ordinances can be assessed and necessary modifications can be made. Part of the effectiveness of these ordinances has to also be enforcement. The streams do not stay clear of silt if silt fences are downed during any major rain event and the consequence to a land owner is nothing more than a request from the city to replace the silt fence so it will stay in good position until the next major rain event.

Addressing the community outrage at land being clear-cut or table-topped is more difficult. In recent cases the letter of the law seems to have been followed in land disturbance permitting, but the community felt that an important community standard for the preservation of natural amenities was violated. In some cases seeming loopholes in the current ordinances were exploited. Some of these can be addressed with specific changes to existing ordinances. One example, discussed further below, is the inclusion of wording making clear legal definition of conserved forest land a default instead of an item to be negotiated if the land owner is willing.

The community desire to preserve natural amenities must be addressed by first defining what natural resources the community desires to preserve and then addressing the procedure and resources required to accomplish this. Columbia has made a great step in this direction with the recent creation of the Natural Resources Inventory. This will be a critical component along with the City of Columbia Vision and Action Plan, Final Report in beginning to frame the natural or green infrastructure that the community desires to preserve.

Green infrastructure planning will be presented in this report as a way to begin to develop a uniquely local framework to preserve natural amenities in a way that enhances both quality of life and the economic viability of our city. Undertaking green infrastructure planning will require expanding current infrastructure planning to include natural amenities that are expected by citizens along with “grey” infrastructure, such as roads, utilities, schools, and fire houses. Preservation and expansion of these natural amenities will go hand in hand with the expansion and maintenance of “grey” infrastructure needs. Green infrastructure planning offers the possibility of preserving and creating natural corridors and hubs that can enhance quality of life and increase urban wildlife habitat, while increasing neighboring property values and providing corridors for pedways and possible future light rail.

In response to the request from City Council to the EEC for this report we have reviewed, in as much detail as time allowed, the existing city ordinances related to land disturbance, land preservation, tree preservation, and land management. The EEC has identified several issues of concern. A discussion of many specific concerns with current ordinances and policies are described below. A sampling of ordinances from other towns has been reviewed. A discussion of proposed short term remedies for some of these concerns are presented which are based on discussions amongst EEC members, with City staff, with members of other commissions and discussions with Columbia citizens. These initial concerns and proposed remedies are important and considerable time and work has gone into them.

In relating the strengths or weaknesses of specific ordinances with the community desire to preserve certain amenities the questions arise: How do we assess if ordinances are having the effect they were intended to have without an overall plan? If there is disagreement in interpretation what overall policy can be referred to? Is someone following the letter of the law or are they exploiting a loophole in the law? This has created a situation that has been deemed unfair by many citizens, neighborhood groups and development interests alike. For this reason the EEC encourages the City Council to develop an overall growth management plan, which would include a Green infrastructure plan as an integral part to clearly address, for all parties, the desires and goals of the community for the preservation of natural “Green’ infrastructure.

III. Issues, problems, and questions

What are the issues, problems, and questions that have arisen around the issue of land disturbance of new development?

1. The term “detailed site development plan” has two disparate meanings in current city ordinances. In Chapter 12 a “detailed site development plan” refers to a plan for dirt moving prior to development. In Chapter 29 a “detailed site development plan” is defined in terms of Planned Business C-P, Planned Office O-P and Planned Unit Development PUD. For clarity and fair access to the planning process at all level these two different uses of the phrase: “detailed site development plan” must be clearly distinguished. For discussion here we will differentiate them with a suffix (ch12) or (ch29).
2. What can be done to include site development plans (ch29) as part of the land disturbance permit process? (ch29)
3. How can cut and fill on a property be limited so that existing topography is not altered before a detailed site development site plan (ch29) has been filed.
4. What can be done to control county property that is cleared prior to requesting annexation into the city?
5. What can be done to control land zoned agricultural that is cleared so that it only meets one zoning type?
6. What can be done to limit the amount of time a site sits idle after it has been cleared for potential development?
7. For land outside of stream buffer zones what can be done to limit the total grading and the amount of cut and fill work that is done?
8. What is done to maintain the 25% of climax forest that is set aside for tree preservation? Is it actually permanently preserved or can it be sold off as part of a future subdivision of the property?
9. How can a piece of property preserved as tree preservation or other preservation area be legally defined so it is protected from future development? (Recently P&Z used a *Greenspace conservation easement in agenda item: 08-24 Silver Oak Senior Living O-P Plan*)
10. There is currently no citizen commission with responsibility for review of land disturbance permits. Should the Planning and Zoning Commission review land disturbance permits as it currently does with zoning requests. Possible another commission should be charged with this oversight and review role.
11. City staff should be provided with tools to determine the preservation status of any property or sub area of a property during and after development.
12. There needs to be a statutory requirement for obtaining any development permits requiring the listing of any previous conservation agreements or easements on the property in question.

13. No land disturbance or tree removal permit should be issued or occur in a planned zoning district prior to the approval of the site development plan by the City Council.

IV. Strengths and weaknesses of the land disturbance/preservation ordinances

What are the current strengths and weaknesses of the current land preservation ordinance (Chapter 12)?

The City of Columbia Code of Ordinances Chapter 12A Land Preservation also known as the “Land Preservation Act of the City of Columbia, Missouri” has the purpose of regulating the disturbance of land surface areas by preserving trees, preventing erosion on disturbed areas and controlling storm water drainage.

The ordinance is written as a performance specification that defines the acceptable results of a site development. This allows the developer/designer/engineer to choose the methods and practices necessary to meet the ordinance for a particular site. This performance specification works well considering the variables that may be encountered on different tracts of land. There are however some prescriptive requirements or Best Management Practices (BMPs) that can be added to enhance this ordinance.

Article III. Tree Preservation and Landscaping Requirements requires a land disturbance permit for logging of trees, but does not require a site development plan if the intention is to develop the land. There is a requirement for maintaining 25% of any climax forest and this 25 % will count toward landscaping requirements in the zoning ordinance.

There is no provision for changing the zoning, assessed value or converting this property to a green belt or some other land trust designation. Chapter 25-3 of the city ordinances does define a “Green Conservation Easement”, there is however no direction or requirement that this 25% of preserved forest be rezoned with this designation.

There is also no provision that disallows land that may be used as right away or utility easement for future connection to adjoining property from being part of 25% maintained climax forest.

The Landscaping Requirements of Article III requires that the landscaping plan comply with the zoning ordinance requirements of a site. Specific landscaping requirement within the zoning ordinance are found in Section 29-25. This article defines what should be shown in the landscaping plan, tree protection requirements, replacement requirements of trees that die, and the completion and final inspection timeline and requirements.

The Landscaping Requirements of Article III and that found in Section 29-25 do not specify particular types of trees, shrubs, or other ground cover such as those that are native or adapt well to our climate. Requirements on BMPs that protect and support the growth of selected plants are also lacking.

Article IV. Sec. 12A-66, Erosion Control Requirements, requires that a soil erosion control plan accompany the application for a land disturbance permit. There is a requirement that a drainage area map showing the entire drainage basin contributing to site (up stream sources) be included. The ordinance also requires that erosion control measures must be designed to provide protection from the runoff of a 10-year return frequency 24-hour duration storm.

More defined quantities of rain in inches per 24-hour period, as well as the saturation level of surrounding permeable soil should be included to more specifically define the design requirements.

There is no requirement to include the down stream flow areas and volume of flow.

There is also not an establishment of liability for the potential downstream erosion damage to adjoining property.

Additional requirements for monitoring and maintaining the erosion control measures, along with timelines for fixing existing measures or installing new measures should be considered.

Access should also be given to the city to inspect all erosion control measures specifically after each heavy rainfall.

The erosion control requirement lacks a liability clause, such as a performance bond or penalty for each failure.

Sites being developed for potential new industries shall be seeded with appropriate ground cover after earth work is completed. There should also be a plan to reseed the site during the spring and/or fall planting season to ensure establishment of ground cover.

Chapter 12A, Land Preservation lacks any kind of control or limits of what can be done on slopes or the extent of how much cut and fill can be done to a site.

V. Land disturbance ordinances from other cities and counties

List of ordinances from other cities and counties that may be used as models for future modifications of Columbia's land preservation ordinance.

Tree Ordinances:

In a letter from the EEC to City Council, dated September 21, 2007, it was recommended that all ordinances pertaining to tree preservation, tree planting and landscaping be re-organized into a single chapter of the of the city's ordinances. Currently the ordinances are found in separate sections of the City's ordinances, which makes enforcement, interpretation and education efforts more complicated. The example given as a potential to follow was the Tree Conservation Ordinance of Sandy Springs, Georgia.

http://files.sandysprings-ga.org/ordinances/20070210Tree_Ordinance.pdf

Land Disturbance and Site Development Permits:

Overland Park Kansas has a good example of a plan submittal checklist.

http://www.opkansas.org/Documents_and_Forms/land_disturbance_checklist.pdf

Erosion Control:

US EPA - Model Ordinances to Protect Local Resources

<http://www.epa.gov/owow/nps/ordinance/>

St. Joe, MO ordinance requires additional temporary erosion control measures.

http://www.stjoemo.info/publicworks/erosion_control.pdf

Steep Slopes:

BMP – Stepped or Terraced Slope, Tracking, Contour Furrows

http://www.northaugusta.net/Dept_Serv/Engin_PublicWorks/stormwater/erosionsedcontrol/ch2landgrading.pdf

Upper Salford Township, Montgomery County, Pennsylvania. Slopes starting at 15%.

http://www.dvrpc.org/planning/community/ProtectionTools/Ordinances/Steep_Slope_Upper_Salford.pdf

East Nantmeal Township, Chester County, Pennsylvania.

http://www.dvrpc.org/planning/community/ProtectionTools/Ordinances/Steep_Slope_East_Nantmeal.pdf

Ten Towns Committee, New Jersey.

<http://www.tentowns.org/10t/ordsteep.htm>

Brentwood, Tennessee.

http://www.brentwood-tn.org/Departments/planning/proposed_hillside_protection.htm

Hunterdon County, New Jersey

http://www.co.hunterdon.nj.us/planning/ordinances/toolbox/Environmental_Toolbox-Steep_Slopes.pdf

Austin, Texas

[http://www.amlegal.com/nxt/gateway.dll/Texas/austin/thecodeofthecityofaustintexas?f=templates\\$fn=default.htm\\$3.0\\$vid=amlegal:austin_tx\\$anc=](http://www.amlegal.com/nxt/gateway.dll/Texas/austin/thecodeofthecityofaustintexas?f=templates$fn=default.htm$3.0$vid=amlegal:austin_tx$anc=)

It should be noted that placing restrictions on steep slopes does not seem to preserve tree cover or promote site designs that are in harmony with the natural topography. Placing limits on the amount of cut and fill that is acceptable on a property helps preserve the topography and eliminates the pre-development practice of “table topping” a site to make it flat enough market easily.

VI. Tools and resources

List tools and resources that should be used as guidance for a new land disturbance ordinance or to be used as a specific tool in the ordinance.

- 1) Natural Resource Inventory
 - I. The Natural Resources Inventory (NRI), when completed, will map and identify existing forest resources in and around Columbia. This report may be used to form the quantitative basis for the development of an urban forestry plan and identify areas with mature trees and vegetation that should be considered for preservation. In addition, the development of a landmark tree ordinance should be considered to preserve large individual trees of significance.
 - II. The NRI can also be used in establishing a property's baseline of climax forest and calculating the required 25% of the climax forest to be maintained as required in the Chapter 12 Land Preservation ordinance.
- 2) Urban Forest Report/Community Forest Master Plan
 - I. The urban Forest report will assist in outlining the value, available resources, and potential future changes to the existing tree preservation ordinances.
- 3) International Stormwater BMP Database <http://www.bmpdatabase.org/>
- 4) Urban Stormwater BMP Performance Monitoring
<http://www.epa.gov/waterscience/guide/stormwater/monitor.htm>
- 5) Preliminary Data Summary of Urban Stormwater BMPs
<http://www.epa.gov/waterscience/guide/stormwater/>
- 6) PedNet – Proposed trail map. <http://www.pednet.org/>
- 7) CATSO 2025 Transportation Plan.
http://www.gocolumbiamo.com/Planning/Plans/Transportation/2025_plan.php
- 8) **Getting to Smart Growth: 100 Policies for Implementation**
<http://www.smartgrowth.org/pdf/gettosg.pdf>
- 9) National Pollutant Discharge Elimination System (NPDES) permit program
<http://cfpub.epa.gov/npdes/>
Stormwater regulation in Columbia has become a significant driver for land disturbance, and because it carries the weight of federal legislation, is likely to affect our locally proposed land disturbance initiatives. Slope, drainage and preservation of existing vegetation and runoff water quality are all covered.

The City of Columbia has a stormwater coordinator, Mona Menezes, who is implementing pilot surveillance projects as an extension of the State of Missouri's joint implementation responsibility under NPDES. Any land disturbance decisions should be cleared with the city office to ensure that they are not in conflict with existing federal statutes.

VII. Review of Some Relevant Parts of Current Planning Documents

Visioning – Development Citizen Topic Group

http://www.gocolumbiamo.com/Public_Comm/Visioning/Final_Vision_Report/documents/15_e_development.pdf

Land Preservation subtopic group goal statement:

Land will be preserved throughout Columbia and Boone County to protect farmland, scenic views, natural topographies, rural atmosphere, watersheds, healthy streams, natural areas, native species, and unique environmentally sensitive areas, thereby enhancing quality of life.

Plan and Manage Growth subtopic group goal statement:

We envision a community with an open, transparent, inclusive planning process that values and manages growth, that protects the environment and the city character, and that is beneficial and equitable to all.

Visioning - Environment Citizen Topic Group,

http://www.gocolumbiamo.com/Public_Comm/Visioning/Final_Vision_Report/documents/19_i_environment.pdf

Environmental Quality subtopic group goal statement:

Columbia and its neighboring communities will be a place where the air, water, land, and natural aesthetic qualities of our environment shall be protected by a combination of conservation strategies including, but not limited to, regulations and ordinances, conservation incentives, education programs, and smart growth planning.

Resource Conservation subtopic group goal statement:

Columbia will be a model community that approaches zero waste of all primary and secondary forms of energy and goods, and that implements best management practices in order to protect and conserve its natural resources and intrinsic beauty for future generations.

Visioning - Parks, Recreation, and Greenways Citizen Topic Group,

http://www.gocolumbiamo.com/Public_Comm/Visioning/Final_Vision_Report/documents/22_1_parks.pdf

Parks subtopic group goal statement:

A variety of attractive, well maintained parks throughout Columbia including neighborhood parks, regional parks, nature parks, and urban parks will ensure all residents have access to a full range of outdoor and indoor recreational opportunities.

Greenways subtopic group goal statement:

An extensive network of greenways will play a significant role in providing transportation options, protecting wildlife corridors, watersheds, and floodplains, and increasing public access to natural and open spaces.

Visioning Transportation Citizen Topic Group,

http://www.gocolumbiamo.com/Public_Comm/Visioning/Final_Vision_Report/documents/23_m_transportation.pdf

Non-Motorized Transportation subtopic group goal statement:

Columbia will enjoy a safe, interconnected, non motorized transportation network. It

will be culturally supported by the citizens as it will encourage social interaction and healthy lifestyles. The roadway, sidewalk, public transit, and trail systems will all tie together into an effective integrated transportation network.

U.S. Mayors Climate Protection Agreement (Council Bill No. R 160-06 A).

SECTION 1-A-2: Adopt and enforce land-use policies that reduce sprawl, preserve open space, and create compact, walkable urban communities.

SECTION 1-A-11: Maintain healthy urban forests and promote tree planting to increase shading and to absorb CO₂.

Metro 2020

http://www.gocolumbiamo.com/Planning/Documents/met-2020_proposed_final_draft.pdf

Metro 2020 Vision Statement:

The vision for Columbia as expressed in this document is a one of a community where residents are content with their physical surroundings and a mix of uses co-exist in a manner that ensures the continued use and enjoyment of property.

Where a system of well **planned** roadways, **greenbelts**, **regional parks** along with sound neighborhoods as building blocks and a strong central city core forming the structure which supports a variety of business, social, recreational, and educational opportunities.

Where the efficient and proper arrangement of land uses and public infrastructure support continued growth and local governments and service providers cooperate to efficiently serve the growing population.

Greenbelt Plan

http://www.gocolumbiamo.com/Planning/Documents/greenbelt_trail.pdf

“The 1935 Columbia Land Use Plan showed a greenbelt in portions of the City, using the term "parkway" to identify them. The plan describes parkways as "usually elongated park areas, often preserving a natural stream valley, and usually providing, either through the area, or on the borders, roadways for pleasure driving".”

2. Purposes and History of the Existing Columbia Greenbelt Plan

Public interest was responsible for the implementation of the first specific greenbelt plans in Columbia. Citizens expressed concern that the City’s natural areas, especially the undeveloped lands adjoining the City’s creeks, were threatened by development. A grassroots public effort was undertaken to preserve these undeveloped lands. The development of a greenbelt plan and the establishment of policies on local creeks and their adjacent lands was seen as an initial step to address this issue and to raise local awareness. This led to the Columbia City Council taking action in response to this public sentiment.

The City of Columbia passed policy resolutions on greenbelts in 1993 and 1995. The most specific of these, PR 42-95A, adopted the Hinkson Creek and Bear Creek Greenbelt Plans and established policy goals for the greenbelt plans. The resolution states "The primary goal of the greenbelt plans is to maintain and preserve open space along major stream corridors. This goal should be accomplished preferably by private ownership or action, or by public acquisition of land or flood plain regulations." Another stated goal was the construction of trails within specific portions of the greenbelt corridor where "appropriate and feasible".

Sub-dividers and developers of land, in addition to other property owners adjacent to and within the designated greenbelt, are encouraged to provide easements or donations of land to the City in order to provide greenbelt protection and access.

Those streams included in the revised general policy resolution, PR 170-95, are Bear Creek, Perche Creek, Hinkson Creek, Flat Branch, Grindstone Creek, Rocky Fork Creek, and Hominy Branch Creek. This resolution does not adopt a plan, but merely establishes the City's policy in regard to these greenbelts.

Currently, the greenbelt plan has no legal standing or regulatory authority. There are no regulations that mandate protection of the designated greenbelts, nor are landowners required to dedicate public easements or make donations of land. The only regulations that affect the greenbelt are those federal rules that impose restrictions on floodplain development. Additional restrictions and/or incentives are desirable if an effective and viable greenbelt is to be implemented.

Summary: There are many plans and vision statements produced through countless hours of public meetings and hearings calling for land preservation in various forms. There have been some great accomplishments resulting from these planning documents. The mixed greenbelt/pedway trail system created in Colombia is perhaps the shining accomplishment. What seems to be missing in these planning documents is a legal status for the creation and growth of a greenbelt or Green Infrastructure system as a part of infrastructure growth. Columbia acquires land for "grey" infrastructure through purchases under specific regulatory authority. Green infrastructure is at times purchased, as in city parks, but most often donations are required at the expense of the landowner. The citizens of Colombia and their elected representatives will have to decide if the desire for land preservation is strong enough to develop legal authority and specific plans, with adequate funding, to expand green belts, and Green Infrastructure.

VIII Short term fixes

The creation of new regulations and revisions to current city ordinances should be based upon the ratified Colombia Visioning Report and Implementation Supplement, the goals, objectives and compatibility guidelines in the Metro 2020 Planning Guide, and the purposes stated for planned zoning districts contained in Chapter 29 – Zoning, in the City of Columbia Code of Ordinances. The common purpose statement for these planned

zoning districts states: “The purpose of this [...] district is to enable innovation and flexibility in design **and to promote environmentally sound and efficient use of land**”.

Land Disturbance:

The land disturbance permitting process is currently separate from approval process for building permits, subdivisions, and development site plans for planned zoning districts. A connection between site grading, site design, and site development needs to be established to implement the goals contained in the Vision Report and Metro 2020.

Immediate changes should be made in the regulations in the planned zoning districts to link the issuance of the Land Disturbance permit with the review and approval of the development site plan. How the proposed development addresses the trees and topography on site is an important consideration that is currently not part of the public review process. No land disturbance or tree removal permit should be issued or occur in a planned zoning district prior to the approval of the site development plan by the City Council.

Tree Preservation:

The City’s current tree preservation regulations were developed without the benefit of an analysis of the existing tree resources in Columbia. The focus on oak/hickory for preservation may be too narrow to implement adopted City policy.

The Natural Resources Inventory (NRI), when completed, will map and identify existing forest resources in and around Columbia. This report may be used to form the quantitative basis for the development of an urban forestry plan and identify areas with mature trees and vegetation that should be considered for preservation. In addition, the development of a landmark tree ordinance should be considered to preserve large individual trees of significance.

As an interim measure, no tree removal permit should issued or occur in a planned zoning district prior to the approval of the site development plan by the City Council.

Land Management Practices:

Protecting steep slopes is one component of an overall strategy of land management. The goal for land management is to minimize land disturbance through site design to maintain the essential landscape features and topographic characteristics of the property. Ideally, the building and site design reflects the advantages and limitations of the site; the site is not simply engineered and graded to fit any building. This supports the purpose

established in the planned zoning districts “to enable innovation and flexibility in design and to promote environmentally sound and efficient use of land”.

1. Limitations on the percentage of a site that may be disturbed and limitations on the extent of topographic alteration that may be cut and/or filled should be added.
2. Steep Slopes: Naturally occurring steep slopes should be restricted from development, where appropriate. These areas should be identified and mapped.
3. Engineered Slopes and Retaining Walls: The height and slope ratio for cut and/or fill slopes should be limited when located adjacent to other land use districts, stream corridors, parks, neighborhoods, etc. as should the permissible grade change through the use of retaining walls.
4. Filling in the Flood Plain: The flood plain should be protected and maintained in a natural state to the greatest extent feasible. The intrusion of engineered slopes in to the stream corridor and flood plain should be limited to flood protection and storm water management structures.

Land Preservation:

Areas with significant environmental sensitivity or community value should be protected from disturbance.

1. A plan and program for the acquisition of property, development rights, easements, etc. will be necessary to preserve land.
2. Land set aside for tree preservation or other preservation areas should, by default and standard practice, be given the status of *Greenspace trail easement* or *Greenspace conservation easement* so that they are protected from future development (Chapter 25-3, see Appendix A.).
3. City staff should be provided with tools to determine the preservation status of any property or sub area of a property during and after development.
4. Existing conservation agreements or easements on a property should be listed on any new permit or zoning change request.

Annexation:

1. Land that has undergone significant land disturbance or tree clearing in the preceding 3-5 years before an annexation request should be denied annexation.

General changes:

1. The term “detailed site development plan” has two disparate meanings in current city ordinances. In Chapter 12 a “detailed site development plan” refers to a plan for dirt moving prior to development. In Chapter 29 a “detailed site development plan” is defined in terms of Planned Business C-P, Planned Office O-P and Planned Unit Development PUD. For clarity and fair access to the planning process at all levels these two different uses of the phrase: “detailed site development plan” must be clearly distinguished.
2. Idle development sites should be subject to regulations on replanting and site maintenance. Citizens do not like living next to a pile of dirt for years.
3. Citizen commission oversight should be added to the land disturbance process whenever a land disturbance request is not part of a planned development request.

IX. Green Infrastructure Planning:

Integrated Planning and Regulatory System for Land Development and Preservation

At the heart of many of the current land use conflicts in and around Columbia is a desire to preserve the natural amenities that people have gotten used. This comes into conflict with the desire of land owners to develop land for profit. The result of these conflicts is usually unsatisfactory to all parties involved. Without a clear plan for land use every development is a battle that starts as the first survey flags are put up and usually ends with a development that the developer feels cost too much due to time spent battling city hall and that neighbors feel took something away from their neighborhood. Most tragically even seeming good developments, such as new pedways or well planned and executed multiuse developments can succumb to the climate of conflict and hostility.

After reviewing current ordinances, ordinances from other cities and discussing policy changes with staff members the EEC has come to the conclusion that a Green Infrastructure plan is required to clearly define for Columbia and Boone County what natural amenities should be preserved and developed. Such a plan is analogous to other “grey” infrastructure and “human resources” infrastructure plans that the City and county have that address other current and future infrastructure needs such as for transportation, utilities and delivery of other City services. Within this new Green Infrastructure plan the range of environmental resources that allow a city to function and be a desirable place to live will need to be included.

What is Green Infrastructure?

“Green infrastructure is the ecological framework needed for environmental, social and economic sustainability.”¹ Green Infrastructure (GI) Planning is of interest to Columbia and Boone County specifically because, in contrast to many other conventional approaches to open space planning, Green Infrastructure Planning “looks at conservation

values and actions in concert with land development, growth management and built infrastructure planning.”¹

Green Infrastructure Planning is a methodology developed by professional city planners.^{2,3} Green Infrastructure emphasizes interconnected systems of natural areas in a sort of Hub and Links system. Hubs can be nature reserves, managed natural landscapes, working lands such as private farms or forests, regional parks and preserves, and community parks and natural areas. These hubs anchor the green infrastructure system and provide a destination for wildlife and ecological processes as well as for citizens of Columbia and Boone County.

Green Infrastructure Links tie the system together and provide corridors for movement of wildlife and people walking or riding bikes either for recreation or commuting. Some forms of linkages are Greenways that are protected corridors of land, Greenbelts, conservation corridors such as river and stream corridors that provide biological conduits for wildlife, and recreational and non-motorized transportation for people, and landscape linkages.

Columbia already has a significant Green Infrastructure. A great example is the MKT Nature and Fitness Trail that acts as a Green Infrastructure Link between Flatbranch Park, Forum Nature area, Twin Lakes Recreation area, Scott Blvd parking and sports fields and on out to the Katy trail. This is also a great example of the interconnection between Green Infrastructure, Fitness and recreation areas and creation of desirable neighborhoods along non-motorized transportation corridors.

An important aspect of Green infrastructure planning is to guide and shape urban form in a way that a framework is created for economic development that maintains and enhances one of the greatest asset that Columbia and Boone County have, which is the great quality of life enjoyed by it's residents.

As reviewed above the desire to maintain quality of life in concert with economic development was a major theme of the recently completed Columbia Visioning Process. The basis to begin developing Columbia's unique Green Infrastructure Plan can be formed by reviewing the Final Visioning report and enlisting the help of Visioning participants in the relevant topic areas.

Implementation of Green Infrastructure Planning

Green Infrastructure Planning needs to be developed as part of the Cities overall effort in Growth management planning. Different pieces of Green Infrastructure Planning have been started already as part of other City efforts. Some of the current projects that can be used in developing a Green Infrastructure Plan are, the Natural Resource Inventory developed by city staff and the GetAbout Columbia Infrastructure Working Plan 2007. The Natural Resource Inventory defines many of the current Natural amenities in Columbia that the City might want to maintain as Green infrastructure. Non-motorized transportation corridors developed in the GetAbout Columbia project can be collocated

with Green Infrastructure Links to leverage community desire for non-motorized transportation and Green infrastructure.

The economic well being of Columbia, Boone County and their citizens has to be a constant concern of government officials when making new policy. Infrastructure plans cannot be implemented that adversely effect a significant portion of the population. At the same time economic growth cannot take place without continual infrastructure development and renewal. Development of green infrastructure has the potential to spur economic development in many ways. It can be symbiotic in the development of future non-automotive transportation corridors such as light rail and ped-ways. It can also draw hi-tech entrepreneurs and convince budding local entrepreneurs that Columbia is a community worth developing their dreams in. It is recommended that a significant expertise be developed within the Regional Economic Development Incorporated to promote the economic value of Columbia's existing and future green Infrastructure.

Specific Initial Recommendations

- 1) Hire a Green Infrastructure Planning Consultant to work with existing City Staff with the goal of developing in house expertise in Green Infrastructure planning.
- 2) As a first step hire or reassign one staff member each in the departments of Planning and Development and within the City funded portion of the Regional Economic Development Incorporated to be Green infrastructure specialists. Other departments will also need to have staff expertise in Green Infrastructure Planning.
- 3) Develop a working group made up of stake holders, key staff with Green Infrastructure expertise and representatives of key commissions, to develop a unique Columbia Green Infrastructure Plan.
- 4) As part of the overall recommendation of this report, based on the developed Green Infrastructures plan, the working group will then be charged with recommending ordinance changes required to implement the Green Infrastructure Plan

X. Stakeholders

List of all stakeholders' Public education and buy-in is the first, most important piece of any plan.

- 1) City of Columbia City Council
- 2) City of Columbia Public Works Department
- 3) City of Columbia Planning and Zoning Commission
- 4) City of Columbia Environment and Energy Commission
- 5) Boone County Planning and Zoning Commission
- 6) Smart Growth Coalition
- 7) Developer groups etc

- 8) Visioning subgroup members that addressed these issues
- 9) MU Plant Science Department, Chris Starbuck
- 10) Neighborhood associations with an interest in land use issues
- 11) Get about Columbia - PedNet

XI. Problems and Barriers

What are some of the problems or barriers in making changes to the current ordinance?

- 1) Finding the right people to work efficiently and effectively together on the process of updating these ordinances.
- 2) Working with the county in developing parallel city and county ordinances that compliment each other in the process of guiding development that is both economically and environmentally sustainable.
- 3) Some will argue that the ordinances work the way they are and there are no need for changes.
- 4) Some will argue that proposed changes are anti-development.

XII. Conclusions

The intention of this report has been to summarize some of the issues and short comings of current ordinances that have caused citizens of the City of Columbia to voice their concern over property developments in recent years. It is hoped that this can be used as the beginning of a discussion that will lead to the creation of a working group of qualified citizens, staff and possibly consultants who will be charged with developing a Green Infrastructure plan for Columbia. From this plan a new set of land preservation and land disturbance ordinances, that are integrated into zoning and overall growth management planning, can be implemented.

XIII. References

- 1) Benedict, Ph.D., Edward T. McMahon J.D., The Conservation Fund. "Green Infrastructure: Smart conservation for the 21st century", Mark A. Sprawl Watch Clearing House Monograph Series.
- 2) Edward T. McMahon, "Green Infrastructure," *Planning Commissioners Journal*, Number 37, Winter 2000
- 3) Mark A. Benedict, "Green Infrastructure: A Strategic Approach to Land Conservation," *American Planning Association PAS Memo, October 2000*

- 4) **“getting to smart growth 100 policies for implementation”**,
www.smartgrowth.org/pdf/gettosg.pdf
- 5) City of Columbia Stormwater Utility: Current and Future Goals and Stormwater Regulatory Programs, PREPARED BY: CH2M HILL for City of Columbia, MO , February 13, 2007
- 6) City of Columbia Stormwater Utility: Review 2007 Stormwater Management and Water Quality Manual, PREPARED BY: CH2M HILL for City of Columbia, MO, January 16, 2007
- 7) City of Columbia Stormwater Utility: extended Baseline Financial Model, PREPARED BY: CH2M HILL for City of Columbia, MO , February, 2008

Links:

Smart Growth Online

<http://www.smartgrowth.org/Default.asp?res=1280>

Blankets appropriate for steep slopes

http://www.stormwatercenter.net/Assorted%20Fact%20Sheets/Tool5_ESC/ESC%20FS9.pdf

Protecting Steep Slopes

http://www.stormwatercenter.net/Assorted%20Fact%20Sheets/Tool5_ESC/ESC%20FS10.pdf

Construction Phasing

http://www.stormwatercenter.net/Assorted%20Fact%20Sheets/Tool5_ESC/ESC%20FS4.pdf

Appendices

A Excerpts from City Ordinances, Chapter 25-3

Ch 25-3

Greenspace access easement. A perpetual interest in land as described and dedicated by subdivision plat. Designation of a greenspace access easement shall contain the same restrictions on use of property as a greenspace conservation easement, except that it shall give the public the right of entry to the area for pedestrian use only. The greenspace access easement does not confer any rights to the city to either maintain or develop the easement for recreational use. Designation of a greenspace access easement shall restrict the owner of the underlying fee from erecting barricades which interfere with lawful access. Nothing in this definition shall be construed to prevent the city from acquiring other easements in property encumbered with a greenspace access easement.

Greenspace conservation easement. A perpetual interest in land described and dedicated on a subdivision plat. By designation of a greenspace conservation easement, no right of entry is given to the city or the public. The use of area contained within a greenspace conservation easement shall be restricted as follows:

(1) No development (as defined in section 12A-5 of this Code) of the property shall occur, except for public or private street, driveway, bridge and utility crossings, where

needed.

(2) No commercial signs or other advertising material shall be placed within the easement area.

(3) There shall be no removal of trees, shrubs or other vegetation on the property except for the performance of acceptable timber stand improvement practices such as selective thinning. The following may continue: mowing and cutting or removal of brush or trees necessary to:

- a. comply with health ordinances;
- b. maintain stream beds, banks, existing agricultural, scenic or recreational uses; or
- c. eliminate poisonous or noxious plant material.

(4) There shall be no use of the property except for public or private street, driveway, bridge, and utility construction, private, noncommercial agricultural, or private noncommercial recreational uses which do not interfere with the growth of the trees and shrubs located on the easement. Uses and activities which are not allowed in district F-1 (floodplain overlay district) shall be prohibited.

Nothing in this definition shall be construed to prevent the city from acquiring other easements in property encumbered with a greenspace conservation easement.

Greenspace trail easement. A perpetual interest in land as described and dedicated by subdivision plat. Designation of a greenspace trail easement shall give the following rights:

(1) Constructing or maintaining a permanent hiking or bicycle trail or path with accessory facilities or accommodation.

(2) The right of entry of the city to maintain and develop hiking or bicycle trails or paths.

(3) The right of entry of the public for pedestrian or bicycle use of the trails or paths which have been constructed within the easement. No right of entry for motor vehicles is granted to the public except for authorized emergency vehicles.

(4) The right to construct public street, bridge and utility crossings as needed.

Nothing in this definition shall be construed to prevent the city from acquiring other easements in property encumbered with a greenspace trail easement.

B. Green Infrastructure: Conservation for the 21st century
(Copy of this document should be included.)