PROPOSED COMPREHENSIVE PLAN AMENDMENT

ITEM: S07-CW-3CP
October 24, 2007

GENERAL LOCATION: Countywide
SUPERVISOR DISTRICT: All
PLANNING AREA: All
PLANNING DISTRICT: All
SUB-DISTRICT DESIGNATION: All
PARCEL LOCATION: All

PLANNING COMMISSION PUBLIC HEARING:
Thursday, November 8, 2007 @ 8:15 P.M.

BOARD OF SUPERVISORS PUBLIC HEARING:
Monday, December 3, 2007 @ 4:00 P.M.

PLANNING STAFF DOES RECOMMEND THIS ITEM FOR PLAN AMENDMENT

For additional information about this amendment call (703) 324-1380.

Reasonable accommodation is available upon 7 days advance notice. For additional information about accommodation call (703) 324-1334.

MAP NOT APPLICABLE

STAFF REPORT FOR OUT-OF-TURN PLAN AMENDMENT S07-CW-3CP

BACKGROUND

The purpose of this Plan Amendment is two-fold:

(1) To strengthen Comprehensive Plan guidance regarding air quality issues in support of:

- The April 19, 2004 document entitled *Improving Air Quality in the Washington Metropolitan Region: Fairfax County's Commitment to Air Quality Excellence—2004 Air Quality Protection Strategy Recommendations, Interim Report* (and related "*Clean Air Café*" menu);
- The Board of Supervisors' Environmental Agenda and related Environmental Improvement Program
- The Fairfax County Environmental Quality Advisory Council's *Annual Report on the Environment*; and
- The Fairfax County Tree Commission's Tree Action Plan

(2) To incorporate support for "green building" practices within the Comprehensive Plan and encourage and promote the application of these practices through Policy Plan guidance.

Air Quality

Air quality in the metropolitan Washington, D.C. area has been improving but continues to fall short of Clean Air Act requirements. In April 2004, the metropolitan Washington, D.C. area was designated by the U.S. Environmental Protection Agency as a moderate non-attainment area for the eight-hour ozone standard. In 2005, there were 19 days for which there were exceedances of this standard within the metropolitan area; monitors in Fairfax County recorded exceedances of the standard on 12 days. Monitoring results from 2006 were similar, with 21 exceedant days in the metropolitan area, with exceedances monitored in Fairfax County on 11 days. In addition, in December 2004, the region was designated as a non-attainment area for fine particulate pollution. There have been no violations of the fine particulate standards recorded in Fairfax County, although there have been exceedances in the Washington metropolitan area.

Ground level ozone is a colorless gas that forms through the reaction of "precursor" compounds known as oxides of nitrogen (or NOx) and volatile organic compounds (VOCs). Ozone within the earth's stratosphere is beneficial, in that it shields the earth from harmful ultraviolet radiation from the sun. However, at ground level, ozone is a harmful pollutant. The "Plan to Improve Air Quality in the Washington, DC-MD-VA Region," approved by the Metropolitan Washington Air Quality Committee in May 2007 (the State Implementation Plan, or "SIP," for the eight-hour ozone standard) identifies the following as the top sources of VOC emissions in the Metropolitan Washington, D.C. area as estimated for 2002 and projected for 2009: Cars, buses, and trucks;

surface coatings (e.g., architectural coatings; traffic markings, industrial coatings); commercial consumer solvent use; and lawn and garden equipment. Vehicle refueling is no longer as significant a source of VOCs in this region as it once was. Top sources of NOx emissions are: Motor vehicles; utilities and other stationary sources; and non-road construction and mining. Significant amounts of NOx are also transported into the region from upwind areas to the west and south.

"Particulate matter" refers to particles found in the air. Of greatest concern from a health perspective are smaller particles (less than 10 micrometers (microns) in diameter), which can accumulate in the respiratory system. "Fine particulates" are defined as particles that are smaller than 2.5 microns in diameter; these are the substances that fall under EPA regulation. In the Metropolitan Washington, D.C. area, major sources of fine particulates include motor vehicles, point sources (primarily power plants), commercial/industrial businesses, construction sites, tilled fields, unpaved roads and the burning of wood. Other fine particulate matter can form in the air from chemical reactions of gases released from motor vehicles and point sources. As noted above, while no exceedances of fine particulate standards have been recorded in Fairfax County, the county is included within the regional nonattainment area. Exposure to high concentrations of particulate matter can adversely affect human health, particularly for sensitive populations.

On May 9, 2003, Fairfax County's Environmental Coordinating Committee, an interagency management-level committee that coordinates on environmental matters, chartered an Air Quality Subcommittee, tasking it to prepare recommendations regarding actions that the county could pursue in support of improved air quality. The subcommittee focused on a number of areas of concern, including education and outreach activities, Comprehensive Plan guidance, the county's Air Pollution Control Ordinance and measures and practices that are implemented on days when high ground-level ozone concentrations are predicted. A draft "findings document" relating to these areas of inquiry was published on January 12, 2004. An interim report containing a series of "2004 Air Quality Protection Strategy Recommendations" was issued on April 19, 2004, in a document entitled "*Improving Air Quality in the Washington Metropolitan Region: Fairfax County's Commitment to Air Quality Excellence*" and a related "*Clean Air Café*" menu. A total of 46 recommendations were identified in these documents.

The Air Quality Subcommittee documents are available for review on the county's Web site at: http://www.fairfaxcounty.gov/opa/airquality/management.htm.

Two recommendations from the interim report addressed the need for amendments to the *Policy Plan* volume of Fairfax County's Comprehensive Plan. The "Phase II" recommendation addressed the need to reference, within the Policy Plan, an Air Quality Management Plan for the county if and when such a document is completed (to date, only the aforementioned interim report and "*Clean Air Café*" menu have been completed). The "Phase I" recommendation addressed revisions that could be pursued immediately; specifically, the following revisions were suggested:

- An update of the introductory text of the "Air Quality" section of the Environment chapter of the *Policy Plan*; and
- Within the "Air Quality" objective, the addition of one or more policies and/or augmentation of existing policies to reference other Policy Plan objectives and policies that have a relationship to air quality, and identification/encouragement of air quality-beneficial actions that can be applied by developers.

This Plan Amendment is intended to satisfy this recommendation.

The Fairfax County Environmental Quality Advisory Council, in its *Annual Reports on the Environment*, has referenced the April 19, 2004 air quality report and associated "*Clean Air Café*" menu and has recommended adoption and implementation of all recommendations within these documents.

The Board of Supervisors' Environmental Agenda, adopted on June 21, 2004, recognizes strong linkages between both land use and transportation and air quality in Fairfax County and includes a number of objectives based on these linkages. The Environmental Agenda also recognizes linkages between tree cover and air quality. This amendment is intended to support the Environmental Agenda. The county's Environmental Improvement Program (most recently revised for FY 2009), which has been developed to outline actions that can be pursued to support the Environmental Agenda, includes a proposed action to amend the Plan to strengthen air quality guidance and to incorporate support for green building concepts (identified as EIP09-GL08-03(B)) and a proposed action to consider green building incentives for private sector development (EIP09-GL09-01(B)). This Plan Amendment would implement the first action and would implement the second action to the extent that it would address promotion of green building practices through the Comprehensive Plan.

The Fairfax County Tree Commission's April 27, 2005 draft Tree Action Plan recognized the linkage between tree preservation/planting and air quality. Specific recommendations that were incorporated into this draft included support for the use of increased tree canopy in air quality planning efforts, increased publicity of the air quality benefits of trees and amendment of the Comprehensive Plan to strengthen tree preservation guidance.

The concepts contained in the draft Tree Action Plan were reviewed by a work group consisting of staff from a number of county agencies, the Virginia Department of Forestry, the Northern Virginia Soil and Water Conservation District, Fairfax ReLeaf, Inc., a private sector land developer and several members of the Tree Commission. On December 11, 2006, the work group presented a revised "Tree Action Plan—A 20-Year Strategic Plan to Conserve and Manage Fairfax County's Urban Forest" to the Board of Supervisors' Environmental Committee. Included within the Tree Action Plan are recommended actions that can be taken to implement a broad set of goals, strategies, and tactics to support improved tree preservation and management

in the county. On January 22, 2007, the Board of Supervisors endorsed the goals and actions identified within the Tree Action Plan.

One of the actions recommended within the Tree Action Plan calls for the amendment of Comprehensive Plan policy "to encourage the use of tree preservation and planting practices to mitigate air pollution that might result from proposed changes to land use and density, including tree plantings that can reduce energy consumption, thereby reducing power plant emissions." This Plan Amendment would implement this recommendation.

The Tree Action Plan included other recommendations that, when implemented, may result in additional Comprehensive Plan amendments. Other actions, including a comprehensive review of county environmental policy documents and the development of watershed-specific tree canopy goals, will be needed before these additional Plan amendments can be considered.

The Cool Counties Climate Stabilization Initiative, which was developed in collaboration with the Sierra Club and other local government partners, supports a broad range of energy conservation, water conservation, land use, transportation and other policies, programs and operations to reduce emissions of greenhouse gases. Included within policy and programmatic/operational templates that have been provided for consideration by counties are: promotion and implementation of mixed use and transit-oriented development; promotion and implementation of tree preservation and planting efforts; promotion and implementation of motorized and non-motorized transportation practices that reduce emissions of greenhouse gases; and promotion and implementation of transportation demand management measures. The Plan Amendment would support a number of efforts identified in the Cool Counties templates.

Green Buildings

A second area of focus of this Plan Amendment is a collection of practices that are commonly known as "green building" practices. The "green building" concept is clearly related to air quality issues and is far broader in scope; this concept incorporates, both individually and holistically, a series of practices in the design and construction of buildings and their associated landscapes that serve to minimize the adverse environmental impact of the development. In its definition of "green design," the United States Green Building Council focuses on five broad areas of concern:

- Sustainable site planning
- Safeguarding water and water efficiency
- Energy efficiency and renewable energy
- Conservation of materials and resources
- Indoor environmental quality

The U.S. Department of Energy indicates that more energy is used in buildings than in any other sector of the U.S. economy, with buildings being responsible for over 70% of all electricity

demand and over 50% of all natural gas demand. In addition, according to the U.S. Green Building Council, commercial and residential buildings are responsible for over 30% of total greenhouse gas emissions and over 12% of potable water use in the United States; the American Institute of Architects indicates that buildings and their construction account for 48% of emissions of greenhouse gases in the United States. The green building approach to design and construction of buildings can serve to provide for economic development needs in a manner that optimizes the efficiency of the use of increasingly scarce natural resources. Green buildings have the added benefits of reduced lifecycle costs (through resource conservation) and are believed to result in increased productivity due to healthier work environments.

Through green building design, buildings can be constructed in a manner that results in more efficient use of natural resources; green buildings also typically incorporate products that have fewer indoor air pollutant emissions than standard products. Energy conservation also has air quality benefits through a reduced need for combustion of fossil fuels at power plants and an associated reduction in NOx emissions. Green building design is supported within the Virginia Energy Plan released by Governor Kaine in September, 2007, within the 2006 Energy Strategic Plan prepared by the Metropolitan Washington Council of Governments, within the "Voluntary Bundle" of local and state government actions that have been identified within the adopted SIP for the eight-hour ozone standard, and within a draft "Air Quality Gold Book" that has been prepared for the Metropolitan Washington Air Quality Committee to recognize initiatives that local governments can take in support of air quality improvement. In addition, "support for energy conservation measures" was recommended for inclusion in air quality policy guidance within the aforementioned April 19, 2004 report from the Air Quality Subcommittee of the county's Environmental Coordinating Committee. The Cool Counties Climate Stabilization Initiative recognizes promotion and implementation of green building certification guidelines within the policy and programmatic/operational templates that are presented for consideration by counties.

Memoranda from staff to the Board of Supervisors in November 2004 and July 2006 addressed green building concepts and the development of a green building policy for inclusion in the Comprehensive Plan; an additional memorandum from staff to the Chairman of the Board of Supervisors in June 2007 addressed development-related green building incentives options. All of these memoranda recommended the incorporation of language supporting green building and energy conservation measures into the *Policy Plan*. The proposed Plan Amendment would satisfy this recommendation. The proposed Plan Amendment would also address a July 9, 2007 request from the Board of Supervisors for consideration of possible ways to promote and encourage green building practices through the Comprehensive Plan.

This Plan Amendment is not proposing incorporation of green building concepts into the more area- and site-specific text of the Area Plan volumes of the Comprehensive Plan. Further, while the establishment of green building-based bonus densities or intensities through Policy Plan guidance can be considered within this amendment, staff is not proposing the establishment of such bonus densities/intensities. This amendment is, however, recommending the establishment

of linkages within the Policy Plan between green building/energy efficient design and attainment of Comprehensive Plan options or levels of development density that are identified within the Area Plan volumes. Further, staff recommends that, during the consideration of site- and/or area-specific amendments to the Plan in the county's employment centers (and other mixed use areas), there be an examination of the extent to which incentives for green building practices can be incorporated, perhaps as conditions that would be linked to additional options for increased densities, intensities and/or building heights. Such examinations should consider implications of increased densities/intensities to a variety of systems, including transportation, utility, school, park and other environmental systems. Upon adoption of this amendment, DPZ staff assigned to Area Plan amendment reviews pertaining to employment centers and other mixed use areas will be asked to evaluate the potential for incorporation of such incentives.

ANALYSIS

Air quality is a regional issue. As noted earlier, pollutant emissions from one jurisdiction do not stay in that jurisdiction, and a substantial component of the pollutants that form atmospheric ozone in the Washington, D.C. metropolitan area are transported into the region from other areas. Similarly, pollutant emissions that are generated in Fairfax County and the rest of the Washington, D.C. metropolitan area can be transported to other regions, thereby contributing to higher atmospheric ozone concentrations in these areas.

Because of the regional nature of the issue, air quality planning efforts in the Washington, D.C. metropolitan area are pursued regionally by the Metropolitan Washington Air Quality Committee, which is staffed by the Metropolitan Washington Council of Governments. MWAQC has developed, and will continue to develop, "State Implementation Plans" for adoption by Virginia, Maryland and the District of Columbia that outline specific emission control measures that will be pursued by each jurisdiction to bring the region into attainment of air quality standards. The SIP for the eight-hour ozone standard was approved by MWAQC in May 2007 and has been submitted by state air agencies to EPA for approval.

Ozone control strategies to date have focused largely on federal and state controls on point source emissions, motor vehicle emissions, evaporative VOC emissions from refueling operations, surface coatings, solvents, industrial/automotive repair activities and open burning restrictions. However, transportation control measures designed to improve traffic flow, reduce vehicle miles traveled and/or reduce vehicle trips have also been incorporated into these strategies. The SIP for the eight-hour ozone standard, for example, contains an appendix that identifies transportation control measures, such as the construction of bicycle lanes, the provision of bus shelters and the provision of new park-and-ride spaces, that are considered in the development of mobile source emissions budgets. Additional local actions can have air quality benefits, but emissions factors for these efforts are still in the process of being formulated and therefore have not yet been incorporated into State Implementation Plans. It is anticipated that such measures will ultimately be included in SIPs to assist in meeting emissions reduction needs.

A draft "Air Quality Gold Book" prepared for MWAQC recognizes such initiatives, including "smart growth planning" that supports transit use and nonmotorized transportation, integrated pest management (which can reduce evaporative VOC emissions), transportation demand management efforts, enhanced bicycle and pedestrian access to transit stations, parking management, the application of "green building" practices for local government projects and urban tree canopy expansion efforts, particularly as such efforts can mitigate the urban heat island effect. Many of these practices can be applied during the land development process.

With regard to "smart growth," a key point of emphasis in the Comprehensive Plan is the need to concentrate employment, housing, entertainment/recreation and retail opportunities in pedestrian-friendly centers, especially in areas served by rail transit. In March 2007, the Board of Supervisors approved a Plan Amendment that provides a standardized definition and set of guiding principles for transit-oriented development in Fairfax County. Because the concept of transit-oriented development supports air quality improvement, it is proposed for inclusion, in general terms consistent with existing policy elsewhere in the Comprehensive Plan, as part of this Plan amendment.

Tree preservation and planting efforts can also have air quality benefits. While trees can emit VOCs, they also remove gaseous and particulate air pollutants through absorption and deposition. Trees also reduce ambient air temperatures through evapotranspiration and shading; cooler temperatures lower the potential for ozone formation. Shading by trees can also reduce energy use in buildings and reduce evaporative emissions from parked motor vehicles. Tree preservation and landscaping efforts that stress the planting of trees and low-maintenance vegetation (i.e., "natural landscaping") can reduce mowing, thereby reducing emissions associated with maintenance. Tree preservation and planting can have the added benefit of reducing levels of carbon dioxide (the primary greenhouse gas) through absorption through photosynthesis and storage of carbon in biomass.

The "green building" concept has gained broad acceptance at all levels of government in just a few years, thanks largely to a series of comprehensive, objective, holistic rating systems that have been developed, and continue to be refined, by the U.S. Green Building Council (USGBC) through the involvement of experts from all segments of the building industry. While not the only available green building rating systems, the Leadership in Energy and Environmental Design (LEED®) green building rating systems have effectively become a standard mechanism through which "green building" design in the United States is certified. LEED has been adopted as the green building rating system of choice by the United States General Services Administration and has been adopted by a number of local governments throughout the country, including several localities in the Washington, D.C. metropolitan area. LEED is also recommended for adoption by Washington, D.C. area localities within an interim report prepared by the Intergovernmental Green Building Group of the Metropolitan Washington Council of Governments.

The LEED rating systems incorporate evaluations of: Sustainable site planning; Water efficiency; Energy efficiency and the atmosphere; Conservation of materials and resources; Indoor environmental quality; and Innovation in design. The following categories of LEED certification have been developed and applied: New commercial construction and major renovation projects; Existing building operations; Commercial interiors projects; Core and shell projects; and Schools. In addition, a pilot LEED for Homes rating system program has, at the time of preparation of this staff report, nearly been completed, and additional rating systems, including LEED for Retail and LEED for Neighborhood Development, are in the pilot stage or otherwise under development. Under the LEED program, projects can achieve one of four levels of certification: Certified; Silver; Gold; or Platinum. The certification level depends on the number of points a project earns on the applicable project checklist.

While LEED has gained widespread acceptance and use throughout the United States, it is not the only green building rating system that has been developed. Competing green building rating systems for both nonresidential and residential development have been and are being developed. The National Association of Home Builders, for example, has developed "Model Green Home Building Guidelines" and is in the process of developing a residential green building standard, in coordination with the International Code Council and based on these guidelines, through the American National Standards Institute's standards development process. It is anticipated that the standards development process will be completed in early 2008.

Another program that supports the energy conservation component of green building design is the ENERGY STAR® program. ENERGY STAR is a government/industry partnership that promotes energy efficiency. For certain nonresidential buildings, the ENERGY STAR rating system uses a 1-100 scale to benchmark the energy performance of the building relative to a standard scale for the building size and location. The lower the energy use, the higher the rating. An Energy Star rating of 75 is sufficient to achieve an "ENERGY STAR" designation for the building. For new residential development, "ENERGY STAR Qualified Homes" are homes that are at least 15% more energy efficient than homes built to the 2006 International Energy Conservation Code. New homes do not earn the ENERGY STAR rating until they have had their energy performance verified through on-site inspections and testing performed by qualified "Home Energy Raters." ENERGY STAR also rates a variety of products for energy efficiency; ENERGY STAR Qualified Products meet specified energy efficiency targets.

Green building projects applying the LEED rating systems are being pursued within the Washington, D.C. metropolitan area. A spreadsheet provided by the U.S. Green Building Council in August, 2007 identified 34 LEED-certified projects and 325 LEED-registered projects in the jurisdictions that are members of the Metropolitan Washington Council of Governments. There may be additional confidential LEED-registered projects in the region. Nationally, over 8,000 projects have been registered and over 900 have been certified.

A number of local governments in the Washington, D.C. metropolitan area have established green building policies, programs and/or requirements in their jurisdictions. Arlington County,

Virginia has a green building incentive program through which bonus densities linked to LEED certification can be awarded for certain projects at the discretion of the county's Board. For applicable projects, at least one LEED-accredited professional must be on the development team, and the submission of scorecards identifying LEED credits that will be attained and the reasons why other credits will not be attained is required. Certain multifamily residential projects are conditioned on energy conservation measures incorporated into the ENERGY STAR program. Arlington County also has a Green Building Fund that supports education and outreach on green building issues and a Green Home Choice program that provides incentives for and otherwise supports green building practices for single family residential development projects.

Washington, D.C. has adopted legislation that will require implementation of green building practices for certain District-sponsored projects (both residential and nonresidential) and private nonresidential projects. Requirements for District-sponsored and District-financed projects will begin to take effect in 2008. For private sector nonresidential development, beginning in January 2009, a green building checklist (LEED scorecard) documenting green building elements to be pursued in the building's construction permit must be submitted with any building permit application for a project exceeding 50,000 square feet. LEED certification for such projects will be required beginning in 2012; incentives to encourage earlier application of green building practices and higher levels of green building performance will be offered. Within the next couple of years, Washington, D.C. will also consider the incorporation of green building practices into its building code and will favor LEED-silver (or better) buildings in its leasing decisions.

Montgomery County, Maryland has adopted legislation that will require, beginning no later than September 2008, LEED certification (or equivalent) for all new and substantially modified nonresidential buildings and some multifamily residential buildings exceeding 10,000 square feet in size. County projects will be subject to a LEED silver certification (or equivalent) requirement.

At the regional level, representatives of a number of local jurisdictions, including Fairfax County, are meeting to share knowledge regarding green building practices and to build support for regional green building efforts. This group, known as the Intergovernmental Green Building Group, or IGBG, has worked closely with staff of the Metropolitan Washington Council of Governments on a regional green building conference that was held on September 29, 2006 and the development of a resolution formalizing the role of the IGBG within the MWCOG structure and supporting application of green building practices throughout the region. This resolution was adopted by the MWCOG Board of Directors on November 8, 2006. An interim report from the IGBG entitled "Greening the Washington Metropolitan Region's Built Environment: A Report to the Metropolitan Washington Council of Governments" has been prepared, and it is anticipated that a final report will be transmitted to the Metropolitan Washington Council of Governments Board of Directors in December 2007. The interim report contains a number of recommendations, including the following:

- "Establish LEED as the region's preferred green building rating system for new commercial construction and high-rise residential projects . . ."
- "Establish COG Regional LEED Certified standard for private commercial and high-rise residential development.* COG Regional LEED Certified is defined as LEED Certified with at least 4 credits from the following:

    i. Additional EA1 credits
    ii. SS7.2 – Heat Island, Roof
    iii. EA 2 – On-site Renewable Energy
    iv. EA6 – Green Power
    v. MR2.2 – 75% Construction Waste Management
    vi. SS 6.1 Stormwater Design – Quantity Control
    vii. SS 6.1 Stormwater Design – Quality Control

    OR 3 credits and ENERGY STAR certification."

    "*Review and revise COG Regional LEED Certified recommendation no later than 2012 with the goal of achieving LEED Silver"
- "Conduct in-depth analysis of and evaluate various green building rating systems for residential development, including affordable housing, and make recommendations for regional adaptation."

The county's Department of Public Works and Environmental Services is routinely applying green building practices on general county building projects and is pursuing LEED certification for several county facilities. Of 20 facilities that are in design, under construction, or have only recently been constructed, 18 are pursuing green building design, with LEED certification anticipated for most.

With respect to costs of green building design, it should be recognized that there are likely to be up-front costs associated with both the preparation of documentation under the LEED program and implementation of green building practices (it should also be recognized that many green building practices can result in long-term savings, e.g., reduced energy and water use, as well as other benefits, such as improved indoor environmental quality). Informal discussions with representatives of the National Association of Industrial and Office Parks suggest a rough estimate of $100,000 in consulting costs for a typical LEED application; this is generally consistent with a case study provided by Wetland Studies and Solutions, Inc., which has been awarded a LEED Gold certification for its building in Gainesville, Virginia. A conversation with a representative with the U.S. Green Building Council suggests that there is a learning curve and that documentation costs are likely to go down as builders gain knowledge with experience. There may also be hard cost premiums associated with green building practices--staff has seen reports and presentations that suggest that there is no significant difference in costs for green buildings (compared with non-green buildings) as well as reports and presentations identifying cost premiums of up to 10% of total construction costs for a LEED gold-level project—the Wetland Studies and Solutions case study attained its LEED gold rating with a 10% construction

cost premium, in part due to the specific green building techniques that were pursued (e.g., a vegetated roof added considerably to the cost). It is DPWES's experience that the incremental cost associated with the LEED silver-level design and documentation/certification effort for a typical library or fire station is in the range of $50,000 to $100,000. DPWES has noted that incremental design fees for LEED projects are likely in the approximately five percent range. It should be recognized, however, that LEED-related construction costs can vary considerably depending on which LEED credits are pursued; the costs of individual credits varies widely, and there is no correlation between the costs and the point values associated with the various LEED credits. Further, aside from a few prerequisites, the LEED program does not mandate which credits must be attained; the developer can choose which credits to seek in order to attain the requisite number of points required for the desired level of certification.

Reduced energy and water usage associated with green building design can result in long-term operational savings that can serve to recover additional construction and design costs, particularly in light of increasing energy costs. It is acknowledged, however, that operational cost savings would only directly benefit those developers that continue to own and operate the buildings they construct. The developer who does not own and continue to operate the building would still be able to promote the long-term operational savings to prospective purchasers. Other less quantifiable, but significant, benefits related to green building projects include improved indoor air quality, improved worker productivity and reduced impact on the natural environment.

As noted above, the LEED program provides significant discretion to the developer regarding which green building practices to pursue and which practices to forego. It should also be stressed that green building design as applied through the LEED program is not synonymous with low impact development; stormwater quantity and quality control are eligible for only a limited number of LEED credits. LEED is, effectively, a companion approach to low impact development techniques of stormwater management that focuses more holistically on the design and construction of low impact buildings.

While this Plan Amendment is focused on air quality and green building issues, the broader environmental benefits of "smart growth" approaches to land development, air quality-sensitive landscaping practices and green building practices should be recognized. Natural systems are interrelated, and therefore development approaches that are designed to provide a particular environmental benefit typically benefit a broader suite of environmental systems. Construction designs that minimize vehicular trips, for example, result in reduced air pollutant emissions, which, in turn, reduce deposition of pollutants onto the ground, thereby benefiting water quality. Water quality is also benefited by landscaping practices that shade parking areas, through reduced impervious cover, vegetative uptake of pollutants and reductions in thermal impacts to streams caused by heating of impervious surfaces. Such practices also provide aesthetic benefits. Therefore, while this Plan Amendment focuses on air quality and green building issues, the broader context of environmental benefits should be recognized.

RECOMMENDATIONS

Consistent with the April 19, 2004 document entitled *Improving Air Quality in the Washington Metropolitan Region: Fairfax County's Commitment to Air Quality Excellence—2004 Air Quality Protection Strategy Recommendations, Interim Report,* (and the related *Clean Air Café* menu), the proposed Plan Amendment updates and expands upon the background text within the "Air Quality" portion of the Environment section of the Policy Plan volume of the Comprehensive Plan and augments and adds to policies addressing air quality issues as follows:

- An existing policy addressing the relationship between air quality and both land use patterns and transportation facilities is augmented through the addition of language supporting specific land use approaches and transportation facilities that serve to encourage transit and non-motorized trips—the proposed language is consistent with guidance found elsewhere in the Plan.
- An existing policy addressing the relationship between air quality and transportation strategies is augmented to highlight specific approaches that can be pursued in this regard (e.g., telework, transportation demand measures, parking management strategies, facilities supporting nonmotorized transportation)—again, the proposed language is consistent with guidance found elsewhere in the Plan.
- A new policy is proposed to recognize the relationship between air quality and tree preservation, tree planting and sensitive landscaping practices. This policy builds upon guidance found elsewhere in the Plan that addresses tree conservation and restoration as well as water quality-sensitive landscaping practices.
- A new policy is proposed to support energy conservation and other green building practices as air quality improvement measures.
- A new policy is proposed to support episodic pollution reduction measures that can be applied when air quality conditions are predicted to be poor.
- A new policy is proposed to support the use of low-emissions maintenance and landscaping equipment.
- An existing policy addressing emissions from stationary sources of air pollution is modified to support the minimization of such emissions as well as the reduction of such emissions.
- Existing text provided subsequent to the air quality objective and policies is deleted; in staff's view, this language would be redundant with the air quality objectives and policies as proposed.

The proposed Plan Amendment also provides for a significant strengthening of the "Resource Conservation" portion of the Environment section of the Policy Plan by introducing the "green building" concept and supporting the application of energy conservation, water conservation and other green building practices. The objective within this portion of the Environment section is proposed for revision such that it would focus more directly on resource use and environmental impacts associated with the design and construction of buildings and associated landscapes, and associated policy language is proposed to highlight energy conservation, water conservation and

other green building practices. A series of green building practices is identified. The proposed Plan Amendment also encourages commitments to implementation of green building practices through certification under established green building rating systems (e.g., LEED or other similar programs) and encourages commitments to ENERGY STAR programs. The proposed Plan Amendment also encourages the inclusion of professionals with green building accreditation on development teams. Because the green building concept incorporates, and is far broader than, an existing policy supporting the application of energy conservation and water conservation measures, this policy is proposed for deletion.

In addition to proposing a policy to provide broad support for green building practices, the proposed Plan Amendment establishes specific linkages between green building/energy conservation performance and attainment of Comprehensive Plan Options, Overlay Levels of development, or other planned uses or densities/intensities. These linkages are being proposed in furtherance of the Board of Supervisors' request for consideration of possible ways to promote and encourage green building practices through the Comprehensive Plan and consideration of development-related green building incentive approaches and Comprehensive Plan linkages to green building design by the Planning Commission's Environment Committee. While the establishment of "bonus" densities or intensities of development that could be awarded for one or more specified levels of green building performance can be considered through this amendment, the proposed Amendment would not establish such "bonus" densities/intensities. Further, the amendment would not establish any new development review procedures through which green building design would be considered. Rather, the concept of green building design would be woven into the fabric of the existing structure of the Area Plans similar to the manner in which Comprehensive Plan conditions are typically applied to Plan Options and/or specific levels of development density or intensity. The proposed linkages are as follows:

- Within the Tysons Corner Urban Center, Suburban Centers, Community Business Centers and Transit Station Areas as identified on the Concept Map for Future Development, the proposed Plan Amendment recommends that green building practices sufficient to attain certification through the LEED program or its equivalent, where applicable, be incorporated for nonresidential development and multifamily residential development of four or more stories where at least one of the following is proposed:

    - Development in accordance with Comprehensive Plan Options;
    - Development involving a change in use from what would be allowed under existing zoning;
    - Development at the Overlay Level; or
    - Development at the high end of planned density/intensity ranges. For nonresidential development, consider the upper 40% of the range between by-right development potential and the maximum Plan intensity to constitute the high end of the range.

- For residential development anywhere in the county, the proposed Plan Amendment recommends that zoning proposals for residential development qualify for the ENERGY STAR Qualified Homes designation, where zoning proposals seek development at the high end of the Plan density range and where broader commitments to green building practices are not being applied.

It is noted that the proposed green building linkages for nonresidential development and multifamily residential development of four or more stories would be limited to the county's growth centers. While a countywide application of these linkages can be considered within the scope of this amendment, it is staff's view that the application of these linkages should be limited, at least initially, to growth centers (where most of the future nonresidential development in the county will occur) and that broader application only should be considered after a certain period of time has elapsed and experiences with this effort can be evaluated. This does not mean that efforts to pursue commitments to green building practices outside growth centers (or for development within growth centers that would not be covered by the linkages) would be inappropriate; the Policy Plan text providing general support for these practices would suggest that the application of these practices need not be limited, even if explicit linkages between Plan recommendations and green building commitments are not applied more broadly.

It is also noted that, while staff is recommending that linkages between green building practices and residential development (aside from multifamily residential development of four or more stories) be limited to the ENERGY STAR Qualified Homes designation, broader linkages between residential development proposals and green building performance can be considered within this amendment. Staff is recommending against broader linkages at this time in light of the evolving nature of this issue—there is not one widely applied green building rating system for most residential development and rating systems that may gain wide application in the future are still in some stage of development or are not broadly available (e.g., LEED for Homes is completing its pilot program; the National Association of Home Builders' effort to develop a standard, based on its Model Green Home Building Guidelines, that will be recognized by the American National Standards Institute is in progress). The interim report from COG's Intergovernmental Green Building Group notes that "certification of green building in the residential sector is in a fluid and dynamic state."

Staff is not recommending that density/intensity bonuses be established through this amendment. It is staff's view that recommended Comprehensive Plan densities and intensities within the Area Plans have been developed carefully and with considerable forethought as to implications to a variety of systems, including transportation, schools, other public facilities, housing, parks/recreation, etc., already factoring in potential density bonuses for affordable housing. Staff is concerned that a broad, countywide density/intensity bonus approach could have the potential to upset the balance that has been considered in the development of Area Plan recommendations. There is also uncertainty regarding what would be the magnitude of a reasonable density/intensity bonus to encourage green building practices. Staff therefore suggests that, as a starting point for this discussion, bonus densities/intensities not be considered within the broad

context of the Policy Plan; it may be more appropriate to consider such ideas during Area Plan review studies and to tailor any green building-based "bonus" densities/intensities to the particular conditions of the area(s) being studied. Examinations of applications of possible density/intensity bonus concepts in Area Plans should consider implications of increased densities/intensities to a variety of systems, including transportation, utility, school, park and other environmental systems.

The proposed policy would recognize LEED explicitly as an acceptable rating system through which green building performance for nonresidential and high rise residential development is measured but would not preclude the application of approaches equivalent to LEED. This is being proposed in recognition of the preeminent role that LEED rating systems have played as a nonresidential/multi-story residential green building measurement benchmark in the United States, the adoption of LEED by many other local jurisdictions in the Metropolitan Washington area, the adoption of LEED by the U.S. General Services Administration, and the recommendation for adoption of LEED by the Intergovernmental Green Building Group of the Metropolitan Washington Council of Governments. Flexibility is also proposed to allow for the consideration of alternative equivalent approaches in order to allow for the consideration of such alternatives on a case-by-case basis during the zoning process and in recognition of the evolving nature of green building rating systems.

The proposed Plan Amendment also promotes the implementation of green building practices through commitments to monetary contributions in support of the county's environmental initiatives, with such contributions to be refunded upon demonstration of attainment of certification under the applicable LEED rating system or equivalent rating system.

In addition, the proposed Plan amendment supports the *a la carte* application of individual green building practices where appropriate.

The proposed Plan Amendment also proposes two revisions to the Residential Development Criteria (Appendix 9 of the Land Use section of the Policy Plan):

- The amendment would add text to the "Energy" component of the "Environment" section to recommend the incorporation of energy efficiency measures into building design and construction. Currently, this component focuses only on energy conservation as it relates to site design techniques relating to solar orientation, landscaping and facilitation of nonmotorized transportation.
- The amendment would augment the existing "Tree Preservation and Tree Cover Requirements" by encouraging air quality-sensitive tree preservation and planting efforts.

Finally, the proposed Plan Amendment adds a definition for "Green Building."

RECOMMENDED POLICY PLAN AMENDMENT

Staff recommends that the Environment Section, Land Use Section (Residential Development Criteria) and Glossary of the *Policy Plan* be revised as follows:

MODIFY:

Fairfax County Comprehensive Plan, 2007 Edition, Policy Plan, Environment Section, pages 2 through 3, as follows:

Air Quality

Air quality in Fairfax County and in the Washington, D.C. area in general has been improving. However, the region has not yet attained federal air quality standards for ozone and fine particulate matter. In April 2004, the metropolitan Washington, D.C. area was designated by the U.S. Environmental Protection Agency as a moderate non-attainment area for the eight-hour ozone standard, and in December 2004, the region was designated as a non-attainment area for fine particulate pollution. ~~The County has not attained federal air quality standards for ozone.~~

High ozone concentrations can adversely affect human health. The Washington, D.C. area has not met the ~~Environmental Protection Agency's (~~EPA~~)~~ standard for ozone since that standard was established. High ozone concentrations result from the interactions of oxides of nitrogen (NOx) and ~~hydrocarbons~~ volatile organic compounds (VOCs) with sunlight (See Figure 1). In the ~~Metropolitan~~ Washington, D.C. area, major sources of NOx emissions ~~of oxides of nitrogen~~ include motor vehicles, utilities and other stationary sources, and non-road construction vehicles. ~~utilities, other point sources, motor vehicles and from natural sources~~. Significant quantities of NOx are also transported into the Washington, D.C. area from areas to the south and west. Major s~~S~~ources of emissions of ~~hydrocarbons~~ VOCs include motor vehicles, lawn and garden equipment and small area sources such as ~~(e.g.~~ surface coatings and solvent use~~) and vehicle refueling~~.

There are a variety of sources of fine particulate matter in the Washington, D.C. area, including motor vehicles, point sources (primarily power plants), construction sites, commercial/industrial businesses, tilled fields, unpaved roads and the burning of wood. Other fine particulate matter can form in the air from chemical reactions of gases released from motor vehicles and point sources. While no exceedances of fine particulate standards have been recorded in Fairfax County as of 2007, the county is included within the regional nonattainment area. Exposure to high concentrations of particulate matter can adversely affect human health, particularly for sensitive populations.

High carbon monoxide (CO) concentrations are also harmful to human health. While high CO concentrations can potentially occur in "hot spots" near points of traffic congestion,

Fairfax County is considered to be in attainment of federal carbon monoxide standards. Other monitored air quality indicators in Fairfax County comply with state and federal standards.

The development of plans to identify emission control measures that will be necessary to bring the region into compliance with ozone and fine particulate matter standards is being pursued at the regional level by the Metropolitan Washington Air Quality Committee. Ozone control strategies have focused largely on federal and state controls on point source emissions, motor vehicle emissions, evaporative VOC emissions from refueling operations, surface coatings, solvents, industrial/automotive repair activities and open burning restrictions. However, transportation control measures designed to improve traffic flow, reduce vehicle miles traveled and/or reduce vehicle trips have also been incorporated into these strategies. Additional local actions can have air quality benefits but have not, as of 2007, been incorporated into emissions reduction strategies. These actions include: "smart growth planning" that supports transit use and nonmotorized transportation; integrated pest management (which can reduce evaporative VOC emissions); transportation demand management efforts; enhanced bicycle and pedestrian access to transit stations; parking management; the application of "green building" practices; and urban tree canopy expansion efforts. Many of these practices can be applied during the land development process.

Tree preservation and planting efforts can also have air quality benefits. While trees can emit VOCs, they also remove gaseous and particulate air pollutants through absorption and deposition. Trees also reduce ambient air temperatures through evapotranspiration and shading; cooler temperatures lower the potential for ozone formation. Shading by trees can also reduce energy use in buildings and reduce evaporative emissions from parked motor vehicles. Tree preservation and landscaping efforts that stress the planting of trees and low-maintenance vegetation can reduce mowing, thereby reducing emissions associated with maintenance.

Objective 1: Preserve and improve air quality.

Policy a. Establish land use patterns and transportation facilities that encourage the use of public transportation and reduce trip lengths to reduce emissions of oxides of nitrogen, carbon monoxide, and hydrocarbons from automobiles. Consistent with other Land Use and Transportation objectives, support and encourage the following during the reviews of development proposals, particularly for proposals in mixed use centers:

- The concentration of growth in mixed-use, transit-oriented centers in a manner that will optimize the use of transit and non-motorized trips and minimize vehicular trips and traffic congestion.

- In mixed-use developments, the provision and orientation of working, shopping, and recreational opportunities in close proximity to residences in a manner that will minimize motor vehicle use.

- The provision of facilities to support transit use (e.g., bus shelters, park-and-ride lots).

Policy b. Implement transportation strategies that reduce auto travel, minimize dependence on single-occupant automobiles and improve traffic flow, thereby reducing auto emissions. Consistent with other Land Use and Transportation objectives, support and encourage the following during the reviews of development proposals, particularly for proposals in mixed use centers and for development proposals with the potential to cause substantial increases in auto-related air pollutants:

- Incorporation of telework options, flexible work schedules, transit use incentives, ridesharing/carpooling programs, shuttle buses and other transportation demand management measures.

- Provision of infrastructure, facilities and/or programs (e.g., on-site transportation coordinators) to support telework efforts and other transportation demand management measures.

- Development of parking management strategies in transit station areas to encourage transit and high-occupancy vehicle use and minimize single occupant vehicle trips.

- Establishment of and/or participation in transportation management associations.

- The location, design and construction of trails, dedicated bicycle lanes and crosswalks to facilitate nonmotorized transportation among residential uses, transit facilities, commercial areas, public facilities and recreational opportunities.

- The provision of facilities that support nonmotorized transportation, such as bicycle parking facilities and changing/shower facilities in office buildings.

Policy c. Support air quality improvement through tree preservation, tree planting and sensitive landscaping practices. Support and encourage the following during the reviews of development proposals:

- Maximization of tree preservation consistent with planned land use and good silvicultural practices.

- Maximization of tree planting/tree cover restoration consistent with planned land use and good silvicultural practices.

- Pursuit of energy-conscious landscaping efforts such as the planting of trees to provide shading of buildings during the summer months.

- Preservation and/or planting of trees to shade parking lots, thereby reducing heating of parked vehicles and associated evaporative emissions.

- Planting of street trees within road medians and along thoroughfares where consistent with safety.

- Pursuit of landscaping practices that optimize the planting of native species of trees, shrubs and other vegetation in a manner that minimizes the need for mowing and other maintenance activities, particularly during the hotter months of the year.

- Minimization of applications of pesticides with reactive VOC content through integrated pest management approaches to pest control.

Policy d. Support energy conservation, minimization of indoor air pollution and other green building practices consistent with Objective 13 of this section of the *Policy Plan*.

Policy e. Support the application of episodic pollution reduction measures that can be applied when air quality conditions are predicted to be poor.

Policy f. Support the use of low-emissions maintenance and landscaping equipment.

Policy ~~c~~g. Apply state of the art technology toward the minimization ~~reduction~~ of emissions from stationary sources of air pollution.

Policy ~~d~~h. In cooperation with federal, state and regional agencies, bring Fairfax County into compliance with federal primary and secondary national air quality standards as soon as possible.

~~Development proposals that are projected to cause a substantial increase in auto related air pollutants should provide a transportation management strategy which minimizes dependence on single occupant automobiles.~~

~~Proposals for significant new stationary sources of air pollutants should implement appropriate control technologies.~~

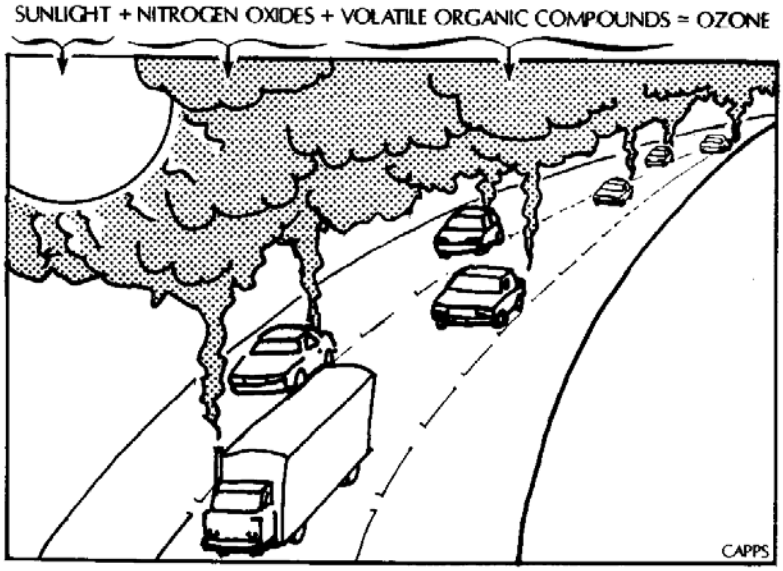

FIGURE 1

MODIFY:

Fairfax County Comprehensive Plan, 2007 Edition, Policy Plan, Environment Section, page 15, as follows:

RESOURCE CONSERVATION AND GREEN BUILDING PRACTICES

The energy shortage in the United States in the 1970s highlighted the finite nature of our natural resources. Since the 1970s, efforts have been pursued at the federal level to enhance energy efficiency and the efficient use of water resources. While such efforts are best addressed at the federal level, local efforts to conserve these resources should be encouraged.

The "green building" concept provides a holistic approach to the reduction of adverse environmental impacts associated with buildings and their associated facilities and landscapes.

Objective 13: ~~**Maintain and enhance the efficient use of natural resources.**~~ **Design and construct buildings and associated landscapes to use energy and water resources efficiently and to minimize short- and long-term negative impacts on the environment and building occupants.**

Policy a. Encourage the application of energy conservation, water conservation and other green building practices in the design and construction of new development and redevelopment projects. These practices can include, but are not limited to:

- Environmentally-sensitive siting and construction of development
- Application of low impact development practices, including minimization of impervious cover (See Policy k under Objective 2 of this section of the *Policy Plan*)
- Optimization of energy performance of structures/energy-efficient design
- Use of renewable energy resources
- Use of energy efficient appliances, heating/cooling systems, lighting and/or other products
- Application of water conservation techniques such as water efficient landscaping and innovative wastewater technologies
- Reuse of existing building materials for redevelopment projects
- Recycling/salvage of non-hazardous construction, demolition, and land clearing debris
- Use of recycled and rapidly renewable building materials
- Use of building materials and products that originate from nearby sources
- Reduction of potential indoor air quality problems through measures such as increased ventilation, indoor air testing and use of low-emitting adhesives, sealants, paints/coatings, carpeting and other building materials

Encourage commitments to implementation of green building practices through certification under established green building rating systems (e.g., the U.S. Green Building Council's Leadership in Energy and Environmental Design (LEED®) program or other comparable programs with third party certification). Encourage commitments to the attainment of the ENERGY STAR® rating where applicable and to ENERGY STAR qualification for homes. Encourage the inclusion of professionals with green building accreditation on development teams.

~~Policy a. Encourage the application of energy conservation and water conservation measures.~~

Policy b. Ensure that zoning proposals for nonresidential and multifamily residential development of four or more stories within the Tysons Corner Urban Center, Suburban Centers, Community Business Centers and Transit Station Areas as identified on the Concept Map for Future Development incorporate green building practices sufficient to attain certification through the LEED program or its equivalent, where applicable, where these zoning proposals seek at least one of the following:

- Development in accordance with Comprehensive Plan Options;
- Development involving a change in use from what would be allowed under existing zoning;
- Development at the Overlay Level; or
- Development at the high end of planned density/intensity ranges. For nonresidential development, consider the upper 40% of the range between by-right development potential and the maximum Plan intensity to constitute the high end of the range.

Policy c. Ensure that zoning proposals for residential development will qualify for the ENERGY STAR Qualified Homes designation, where such zoning proposals seek development at the high end of the Plan density range and where broader commitments to green building practices are not being applied.

Policy d. Promote implementation of green building practices by encouraging commitments to monetary contributions in support of the county's environmental initiatives, with such contibutions to be refunded upon demonstration of attainment of certification under the applicable LEED rating system or equivalent rating system.

Policy ~~b~~e. Encourage energy conservation through the provision of measures which support nonmotorized transportation, such as the provision of showers and lockers for employees and the provision of bicycle parking facilities for employment, retail and multifamily residential uses.

MODIFY:

Fairfax County Comprehensive Plan, 2007 Edition, Policy Plan, Land Use Section, Appendix 9 (Residential Development Criteria), page 26, as follows:

3. Environment:

All rezoning applications for residential development should respect the environment. Rezoning proposals for residential development, regardless of the proposed density,

should be consistent with the policies and objectives of the environmental element of the Policy Plan, and will also be evaluated on the following principles, where applicable.

a) *Preservation:* Developments should conserve natural environmental resources by protecting, enhancing, and/or restoring the habitat value and pollution reduction potential of floodplains, stream valleys, EQCs, RPAs, woodlands, wetlands and other environmentally sensitive areas.

b) *Slopes and Soils:* The design of developments should take existing topographic conditions and soil characteristics into consideration.

c) *Water Quality:* Developments should minimize off-site impacts on water quality by commitments to state of the art best management practices for stormwater management and better site design and low impact development (LID) techniques.

d) *Drainage:* The volume and velocity of stormwater runoff from new development should be managed in order to avoid impacts on downstream properties. Where drainage is a particular concern, the applicant should demonstrate that off-site drainage impacts will be mitigated and that stormwater management facilities are designed and sized appropriately. Adequate drainage outfall should be verified, and the location of drainage outfall (onsite or offsite) should be shown on development plans.

e) *Noise:* Developments should protect future and current residents and others from the adverse impacts of transportation generated noise.

f) *Lighting:* Developments should commit to exterior lighting fixtures that minimize neighborhood glare and impacts to the night sky.

g) *Energy:* Developments should use site design techniques such as solar orientation and landscaping to achieve energy savings, and should be designed to encourage and facilitate walking and bicycling. <u>Energy efficiency measures should be incorporated into building design and construction.</u>

MODIFY:

Fairfax County Comprehensive Plan, 2007 Edition, Policy Plan, Land Use Section, Appendix 9 (Residential Development Criteria), page 26, as follows:

4. Tree Preservation and Tree Cover Requirements:

All rezoning applications for residential development, regardless of the proposed density, should be designed to take advantage of the existing quality tree cover. If quality tree cover exists on site as determined by the County, it is highly desirable that developments meet most or all of their tree cover requirement by preserving and, where feasible and appropriate, transplanting existing trees. Tree cover in excess of ordinance requirements is

highly desirable. Proposed utilities, including stormwater management and outfall facilities and sanitary sewer lines, should be located to avoid conflicts with tree preservation and planting areas. Air quality-sensitive tree preservation and planting efforts (see Objective 1, Policy c in the Environment section of this document) are also encouraged.

MODIFY: Fairfax County Comprehensive Plan, 2007 Edition, Policy Plan and Area Plans, Glossary, as follows:

GREEN BUILDING: Structures and their associated landscapes that are located, designed, constructed, operated and dismantled in an environmentally responsible manner to minimize short- and long-term negative impacts on the environment and building occupants.