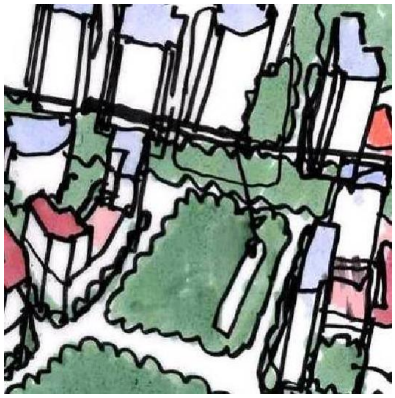


ENVIRONMENTAL STEWARDSHIP

Tysons has a unique opportunity to become a leader in environmental stewardship through the protection and improvement of both the man-made and natural environments. The plan for a future Tysons recognizes that these environments cannot be addressed in isolation or independently. More efficient land use patterns, along with a strong emphasis on multi-modal transportation systems, as identified in the vision for Tysons, are important first steps in creating a more sustainable community. In addition, the plan for a sustainable Tysons calls for enhanced stormwater management, the promotion of green buildings and low impact development techniques, and the provision of a green network of parks, open space and trails. The goals and objectives identified by this section will ensure that Tysons redevelops as a model sustainable community, creating a healthy and environmentally responsible place to live, work and play.

The vision for a sustainable Tysons recognizes an evolving approach, with a long-term goal of carbon neutrality (i.e., no net increase of greenhouse gas emissions from Tysons). With redevelopment, many steps can be taken to reduce environmental impacts and increase efficiency utilizing the practices and technologies available today. Improved air quality, energy conservation, stream restoration and protection, water conservation and reuse, green architecture, and restored and enhanced natural environments can all be achieved now.

Over the next decades, the benefits of current efforts and many others will be better understood. At the same time, new technology may lead to improvements in water conservation and management of stormwater and wastewater. Improvements in information and communications technology could be used to monitor resource consumption and to make the transportation system operate more efficiently.

Finally, new technologies may provide opportunities for further innovations in energy efficiency and resource conservation. With this knowledge, additional steps in building design and urban planning should be implemented to achieve the long-term goal of carbon neutrality for Tysons by 2030 in support of broader regional greenhouse gas emissions reduction goals (i.e., an 80% reduction in regional greenhouse gas emissions by 2050).

MORE SUSTAINABLE THAN TYSONS TODAY

Through the application of technology, development designs and practices that will improve the protection and enhancement of environmental resources and that will improve energy and natural resource conservation and management, redevelopment efforts in Tysons can be expected to contribute to a future Tysons that will be a far more sustainable community than that which exists today. To achieve this vision, it will be necessary to implement several strategies that will reduce resource use and dependency, decrease detrimental environmental impacts, and enhance the environment. A combination of effective land use and transportation policies creates the basic foundation for the sustainable Tysons, and redevelopment efforts within Tysons will provide opportunities to build upon this foundation.

The concept of transit-oriented development or TOD is being promoted for the Tysons area. TOD is a land use pattern which emphasizes compact, dense, walkable neighborhoods focused around transit stops. National studies have shown that TOD provides increased transit ridership. TOD improves the efficiency and effectiveness of transit service investments by increasing the use of transit near stations by 20 to 40 percent, and up to five percent overall at the regional level.

TOD has also been shown to reduce rates of increase in Vehicle Miles of Travel (VMT). Nationally, vehicle travel has been increasing faster than population growth. TOD has proven to lower annual household rates of driving by 20 to 40 percent for those living, working, and/or shopping within transit station areas. Recent TOD research shows that automobile ownership in TOD areas is approximately one half the national average. By providing safe and easy pedestrian access to transit, TOD has produced lower rates of air pollution and energy consumption. TOD can also reduce rates of greenhouse gas emissions by 2.5 to 3.7 tons per year per household. [The[BJC3]] street network in Tysons will incorporate Low Impact Development (LID) Techniques ~~in medians and rights of way~~ for additional environmental benefits. In addition to being green, streets will also be "complete streets," with walking and jogging trails and bicycle paths.

(THIS SENTENCE WAS MOVED/EDITED FROM ANOTHER SECTION)

Reductions in greenhouse gas emissions from the transportation sector will be achieved by reducing vehicle miles traveled. Focusing development near Metro stations and the dedicated right of way circulator, and constructing walkable, bikeable, mixed use developments will reduce VMT. Aggressive transportation demand management programs, including parking management, are also critical to achieving VMT reduction goals.

Tysons' redevelopment should be pursued in a manner that will reduce greenhouse gas emissions to help achieve 80% greenhouse gas reductions within the region by 2050 in accordance with the Cool Counties Climate Stabilization Initiative adopted by the Fairfax County Board of Supervisors. These reductions can only be attained through reductions in energy use and associated greenhouse gas emissions from transportation and buildings. Innovative energy efficiency and conservation strategies should be incorporated into all redevelopment projects.

Toward this end, the following are but a few examples of efforts that could be considered: on-site generation of electricity, such as from solar, wind or geothermal sources (thereby reducing the need for power from the electrical grid); the use of community energy distribution systems; transit-oriented development design; the use of energy efficient heating and cooling systems; and the application of enhanced building commissioning to provide early and ongoing verification of system performance. Numerous other strategies as outlined in green

building rating systems such as the U.S. Green Building Council's Leadership in Energy and Environmental Design (LEED) program are available to support energy-efficient development and conservation.

More compact development, like that proposed in the concept for Tysons, uses less energy than low density, suburban style development. For residential housing, the energy consumption rates decrease on a per capita basis as the density increases. In addition, green building design, as encouraged through green building rating systems with third party verification such as the LEED program, reduces energy consumption and encourages innovations in water and wastewater technology. A combination of these and other strategies can have a significant impact on resource consumption for individual buildings, and can contribute to a more sustainable Tysons ~~Corner~~.

STORMWATER MANAGEMENT

Tysons ~~Corner~~ is located in the headwaters area of several of the county's watersheds. Watershed management plans have been prepared for each of these watersheds; these plans identify a comprehensive set of projects needed to improve stream habitat conditions. These efforts are intended to be pursued independent of development proposals and are not dependent upon such proposals for implementation. However, the provision of effective stormwater management controls for new development and redevelopment projects in these watersheds is imperative to the success of watershed planning efforts. Redevelopment offers considerable opportunities to improve upon past stormwater management practices.

Receiving waters downstream of Tysons should be protected by reducing runoff from impervious surfaces within Tysons. By using a progressive approach to stormwater management, downstream stormwater problems can be mitigated and downstream restoration efforts can be facilitated. Achieving a goal of retaining on-site and/or reusing the first inch of rainfall will ensure that runoff characteristics associated with the site will mimic those of a good forest condition for a significant majority of rainfall events.

Measures to reach this goal may include application of Low Impact Development (LID) Techniques (including but not limited to rain gardens, vegetated swales, porous pavement, vegetated roofs, tree box filters, and water reuse). The incorporation of LID practices in the rights-of-way of streets will also support this goal; such efforts should be pursued where allowed. There is also a potential for the establishment of coordinated stormwater management approaches to address multiple development sites.

(THE FOLLOWING SECTION WAS MOVED/EDITED FROM ANOTHER AREA)

Stormwater Design[BJC4]

Environmentally-friendly stormwater design should be an integral design principle ~~that should be part~~ of the conceptual stage of site development for all redevelopment, recognizing that stormwater management measures may be phased with development. The stormwater design should first seek to minimize the effect of impervious cover, followed by the application of stormwater reuse, retention, detention, extended filtration and, where soils and infrastructure allow, infiltration to improve downstream waters. The incorporation of stormwater management strategies in parks and other open space areas within or adjacent to ~~the~~ Tysons ~~Urban Center~~ may also support this approach while providing recreational amenities. Coordination of stormwater management controls among multiple development sites may also be effective in achieving stormwater management goals in an efficient manner. ~~This~~ [BJC5]~~could include the construction of new regional ponds or modifications to existing regional ponds.~~

Stormwater management and water quality controls for redevelopment should be designed to return water into the ground where soils are suitable or reuse it, where allowed, to the extent practicable. Reduction of stormwater runoff volume is the single most important stormwater design objective for Tysons. Reduction could occur through techniques that use plants or soils via landscaping measures, through techniques that reuse harvested rainwater in a variety of ways, and/or through approaches that infiltrate water into the ground to replenish aquifers and provide summer base flows to local streams.

Redevelopment projects in Tysons should incorporate innovative stormwater management measures in a manner that will, first and foremost, optimize reduction of stormwater runoff volume and control of peak flows for the remaining stormwater that cannot be completely captured on-site.

The following guidelines are recommended for applications for which a significant increase in density/intensity is proposed (e.g., a redevelopment option is being pursued) and are intended to improve stormwater management controls sufficiently to allow for improvements to the habitat and recreational values of streams in Tysons through natural restorative processes and/or through restoration projects:

- Stormwater quantity and quality control measures should be provided ~~that are substantially more extensive than minimum requirements~~[cel6][BJC7], with the goal of reducing the total runoff volume and/or significantly delaying its entry into the stream system. The emphasis should be on Low Impact Development (LID) techniques that evapotranspire water, filter water through vegetation and/or soil, return water into the ground or reuse it.

- LID techniques of stormwater management should also be incorporated into new and redesigned streets where allowed and practicable.

- At a minimum, the first inch of rainfall should be retained on-site through infiltration, evapotranspiration and/or reuse. If, on a given site, the retention on-site of the first inch of rainfall is demonstrated not to be fully achievable, all available measures should be implemented to the extent possible in order to support this goal and achieve partial retention of the first inch of rainfall.

- At a minimum, ~~stormwater management measures that are sufficient to attain both the stormwater design quantity control and stormwater design quality control credits[2] of the~~

~~2 These credits, as set forth in LEED 2009 for New Construction and Major Renovations, are as follows:~~

~~**SS Credit 6.1: Stormwater Design Quantity Control:**~~

- ~~For sites that have greater than 50% impervious cover in the existing condition, the total volume of runoff released from the site in the post developed condition for the 2 year, 24 hour storm should be at least 25% less than the total volume of runoff released in the existing condition for the same storm. Furthermore, the peak runoff rate for the 2 year, 24 hour storm in the post developed condition should be at least 25% less than the existing condition peak runoff rate for the same storm.~~
- ~~For sites that have 50% or less impervious cover in the existing condition, the total volume of runoff released as well as the peak release rate for the 1 and 2 year, 24 hour storm in the post developed condition should be equal to or less than the total runoff volume and peak release rate in the existing condition for the same storm. Alternately, a stormwater management plan that protects receiving stream channels from excessive erosion, including stream channel protection and quantity control strategies, may be pursued.~~

~~most current version of the LEED-NC or LEED-CS rating system (or the equivalent of these credits) should be provided.~~ **stormwater management measures that are sufficient to attain the stormwater-related credit(s) of the most current version of the LEED-NC or LEED-CS rating system [or the equivalent of the credit(s)] should be provided.** If, on a given site, the attainment of the stormwater design LEED credits (or equivalent) is demonstrated not to be fully achievable, all available measures should be implemented to the extent possible in support of this goal.

- Equivalent approaches may incorporate coordinated stormwater management on multiple development sites and/or off-site controls. Additional stormwater management efforts should be encouraged.

- Restoration and/or stabilization of degraded streams on development sites should be pursued **as identified in the District Recommendations** ~~where feasible~~; restoration and stabilization techniques that incorporate ecologically and aesthetically beneficial, vegetated approaches are preferred. Off-site efforts to restore and/or stabilize streams in Tysons should also be encouraged.

Green Building Design and Energy/Resource Conservation

Existing Fairfax County policy calls for certain zoning proposals for nonresidential development and multifamily residential development ~~of four or more stories~~ in ~~urban~~ **mixed-use** centers to incorporate green building practices sufficient to attain LEED certification or its equivalent. **In addition, ~~N~~nonresidential** development in Tysons should ~~go one step further~~ and seek LEED Silver certification or equivalent as a minimum. Residential development should be guided by the Policy Plan objectives on Resource Conservation and Green Building Practices.

All redevelopment projects in Tysons should incorporate design elements and practices that will reduce the use of energy and water resources. There are numerous strategies available that are outlined in green building rating systems such as the LEED program, and strategies such as these should be pursued in support of or in addition to efforts to attain LEED Silver certification or its equivalent. The following are examples of efforts that could be pursued:

- ~~Transit-oriented development design~~
- ~~Transportation demand management programs~~
- On-site renewable energy generation, such as solar, wind and/or geothermal systems;
- If/when on-site renewable energy generation is not cost effective at the time of building design, the provision of building designs that will facilitate future retrofits for on-site energy generation if/when such efforts will become cost effective;
- Orientation of buildings for solar access;
- Energy-conscious landscape design (e.g., natural landscaping; shading);
- Water-efficient landscaping;
- The use of energy efficient heating, ventilation and air conditioning systems;

~~**SS Credit 6.2: Stormwater Design Quality Control:**~~
~~• Stormwater runoff associated with the development should be controlled such that the first one (1) inch of rainfall is reused, infiltrated or treated in a manner through which 80% of the average annual post-development total suspended solids (TSS) are removed.~~

- Enhanced building commissioning to provide early and ongoing verification of system performance;
- The use of energy efficient lighting systems;
- The use of energy conserving building materials;
- The provision of vegetated and/or highly reflective roofs;
- The use of community energy distribution systems through which energy/heat generated on one site will be shared among buildings on other nearby sites;
- The use of water-conserving plumbing fixtures;
- The use of harvested stormwater runoff for irrigation;
- Where consistent with building codes, the use of grey water;
- The use of information and communications technology to improve the efficiency and economy of building operations; and
- If/when the provision of information and communications technology efforts is not cost effective at the time of building design, the design of buildings to include conduits supporting the future installation of such measures.

Setting Future Environmental Goals for Tysons

Tysons should endeavor to remain the leader in environmental stewardship. As such, the Plan should include flexibility to accommodate new strategies and technologies as they emerge, such as district energy systems, alternative energy sources, cogeneration, microgrids, district-scale environmental performance measures, innovative stormwater management and stream restoration practices, innovative green building practices and innovative approaches in the provision and design of park facilities and other open spaces. In order to encourage the use of new technologies as they become available, the Environmental Stewardship Guidelines will need to be regularly reviewed and updated.

NATURAL RESOURCES MANAGEMENT

Protection, enhancement and management of natural resources in the existing stream valley parks in Tysons is critical to the long term viability of those habitats. Both Scotts Run and Old Courthouse Spring Branch and the forested floodplains that surround them have been negatively impacted by years of unchecked stormwater runoff, consumption of understory plants by deer, and encroachment by non-native invasive plant species. Without active management of the natural resources in these parks, habitat and stream quality will continue to decline.

Contributions from development in Tysons towards stream restoration and stabilization in the Scotts Run, Old Courthouse Spring Branch, Rocky Run and Pimmit Run watersheds should be encouraged as part of a comprehensive strategy to restore the water quality and ecological health of Tysons' streams. Associated improvements to the receiving streams and downstream areas could provide greater stability and water quality and improve instream habitat. Stream restoration will also enhance the stream valley parks which are key components of Tysons' green network.

Environmental enhancement efforts should be encouraged and should include efforts such as restoration planting in natural areas, invasive plant control, deer management, stream restoration, and creating new natural areas (including both forested areas and meadows) where disturbed areas currently exist. These expanded natural areas could build on the stream valley parks, adding land that increases riparian buffers and enhances stream valley corridors. Natural areas outside of Resource Protection Areas could serve as nodes for human activity and greatly improve quality of life while relieving stress on existing riparian areas. Stream valley park expansions should not include large hardscape areas (other than trails) and resources management should drive park design.

TREE CANOPY GOALS

Trees provide numerous environmental and human health benefits and should be considered an essential element in the vision for a new Tysons. Environmental benefits include stormwater management, energy conservation, and mitigation of ozone and carbon in the air. When clustered together, as in a park setting, trees provide habitat areas for wildlife. From an urban design perspective, street trees enhance aesthetics, provide shade and relief from the sun and other elements, and create a sense of safety and protection from street traffic and noise.

In 2009, tree canopy covered about 20% of the total land area in Tysons. Much of the tree cover in Tysons is provided in the Scotts Run and Old Courthouse Stream Valley Parks, with additional stands of trees on private land, primarily in the North Central District. Smaller and younger trees are scattered throughout Tysons as part of parking lot design and office campus open space areas.

The vision for a greener Tysons calls for additions to the tree canopy through planting on existing park land, establishment of small groves of trees in new urban parks, as part of the new urban streetscape, and on some rooftops.

As an interim goal, new development should be designed to provide the maximum amount of sustainable tree cover onsite, with a goal of 10% for redevelopment projects. Where developments are not able to achieve 10% tree cover onsite, contributions should be provided to the County's tree fund to support tree planting in other suitable areas to offset the difference. Detailed analysis of existing Tysons tree cover should be conducted before setting a permanent goal.

Care should be taken so that underground utilities do not conflict with street trees. Urban trees also need adequate root zones and soil volume for the best chance for long-term survival. Additional guidance on tree planting is provided in other sections of this plan including Stormwater Management, Green Buildings, Parks and Recreation, and Urban Design.

INFORMATION AND COMMUNICATIONS TECHNOLOGY

Information and communications technology (ICT) in Tysons will serve a variety of end users. These include building owners and operators, residents, workers at Tysons' job centers, customers at its malls and other stores, visitors, and County first responders and environmental specialists. ICT coverage will extend from individual rooms and fixtures to buildings, groups of buildings, roads and rail, each of the eight districts, and the Tysons ~~Corner~~ Urban Center as a whole. The ICT infrastructure will consist of a number of computer-based networks, functioning together in an integrated hierarchy. These networks will be used to improve the efficiency and

economy of building operations and of the transportation system. They will also be used to monitor the achievement of environmental goals, such as reduced levels of energy and water consumption. In order to have an ICT infrastructure in the Tysons ~~Corner~~ Urban Center, its components must be included in the design of buildings and roads.

GREEN BUILDINGS

Currently Fairfax County encourages new buildings in mixed use centers to have Leadership in Energy and Environmental Design (LEED) certification, or the equivalent. The concept of green buildings recognizes that certain design and construction practices can increase the efficiency of resource use, protect occupants' health and productivity, and reduce waste and pollution. LEED, developed by the U.S. Green Building Council, is just one rating system used to measure a building's effectiveness on these measures. Non-residential development in Tysons should achieve LEED Silver certification or the equivalent, at a minimum. Residential development should be guided by the Policy Plan objectives on Resource Conservation and Green Building Practices.

Buildings are one of the largest consumers of energy in this country. According to the U.S. Green Building Council, buildings use one-third of our total energy, two-thirds of our electricity, and one-eighth of our water. With the extensive redevelopment that will occur in Tysons, a prime opportunity exists to reduce the amount of energy consumed by the built environment through LEED certification, or its equivalent, for new construction.

A ~~recent~~ study conducted in 2008 by the New Buildings Institute concluded that, on average, LEED certified buildings use 25 to 30 percent less energy than non-LEED certified buildings. Gold and Platinum LEED certified buildings, the highest certification that can be achieved, have an average energy savings of approximately 50 percent when compared with similar buildings without LEED certification.

In addition to green buildings, green roofs (also referred to as vegetated roofs) can enhance the natural environment within Tysons. Green roofs use the traditionally unused part of the building to grow vegetation. Public benefits of green roofs include increased stormwater retention, reduced greenhouse gas emissions, and improved air quality through filtration of airborne particles. Where green roofs are not provided, other roofing systems containing highly reflective materials may be considered, as they can reduce heat absorption and thereby conserve energy and reduce related greenhouse gas emissions.

PARKS AND RECREATION

Parks, recreation and open space are essential throughout Tysons. A comprehensive park system helps to provide a high quality of life for residents by contributing economic, social and health benefits. Such amenities provide visual breaks in the urban landscape, create oases of green in an intensely urban environment, and provide places for people to enjoy passive and active leisure pursuits. Public open space is especially important for residents of higher density housing who may lack access to private yards or recreation facilities. Urban parks improve air quality, reduce stormwater runoff and impervious surfaces, improve community health, and provide opportunities to allow people a full range of leisure pursuits and to meet their neighbors in a safe environment. Parks will help provide a sense of place for Tysons and its individual neighborhoods.

In 2014, there were about 89 acres of public parkland within Tysons, located primarily at the lower density edges of Tysons. The stream valleys at the western and eastern edges provide a respite from urban activity and serve a valuable resource protection function. ~~Existing park land is primarily resource-based and located at the transitional edges of Tysons.~~ Only ~~one park,~~ Westgate and Freedom Hill Parks~~, has~~ had significant recreation facilities. Opportunities exist to create an outstanding park system to which all contribute and from which all benefit. As a key part of the vision for Tysons, future residents, employees and visitors to Tysons should enjoy a level of park service comparable to that in exemplary U.S. cities. Outdoor recreational areas should support and foster social interaction as well as sports and recreation activities.

In 2014 the Park Authority endorsed the *Tysons Park System Concept Plan*, a supplemental document that will provide guidance about future park development by the public, private and non-profit sectors to serve Tysons' residents, employees and visitors well into the future.

While many Tysons developments will include urban parks as amenities, ~~contributions of~~ recreational facilities will also be needed to ensure a park system that serves the wider range of needs. Adopted County-wide recreation facility standards, adjusted for urban demographics and use patterns, will guide the service level ~~enjoyed by~~ for residents, workers and visitors to Tysons, ~~who will have~~ensuring they will have a full range of leisure opportunities within convenient distances. Facilities for which adopted standards are not available, such as running tracks, game tables, bocce courts, and putting greens may also be provided, since they will provide outdoor recreational opportunities that are desirable in an urban area. Publicly accessible indoor facilities, such as multipurpose program areas, indoor gyms, and courts may also be provided to meet a portion of the need. Over time, the types of facilities needed and desired may change. Preferences and evolving trends should be monitored through park and recreation trends analyses, needs surveys, and County-wide park and recreation needs assessments. Flexibility, adaptability, and imagination will be needed to allow for recreational facilities and activities yet to be conceived.

A goal of twenty new athletic fields serving Tysons should be achieved through development contributions of land and facilities. Enhancements to and redesign of nearby school and park fields to increase capacity should also be strategies for serving increased sports needs in Tysons.

The provision of athletic facilities that require larger land areas within Tysons is especially important and challenging. Creative approaches to providing for sports needs in Tysons will be necessary, including integrating facilities within development areas, on rooftops, over stormwater detention facilities, in utility corridors, indoors, and other alternative locations. The rooftops of parking structures and other buildings in Tysons will be considered as locations for some of the new athletic fields and courts that are needed to help meet the future demand for active recreation facilities. ~~Through innovative design features such as~~The use of field lighting and synthetic turf and scheduling that provides for longer and more efficient use~~,~~ will ensure adequate field capacity to meet the needs of Tysons' growing population ~~can be expanded and the number of needed fields can be reduced~~. ~~Overlay f~~Fields~~s~~ designs that accommodate multiple sports can reduce the amount of land needed and maximize recreational opportunities. Adopted Countywide field standards are based on a majority of youth participants. It is anticipated that in Tysons there will be a majority of adult field users. Corporate softball, flag football, kickball, soccer and adult baseball are anticipated needs. Other field sports~~, such as cricket,~~ may also emerge as a greater need over the horizon of this plan and may need to be accommodated.

Parks and open space should be located to best serve the overall needs of the residents, visitors and employees in Tysons. Park land can be publicly owned, privately owned, or provided through public-private partnerships. It is also important to pursue creative solutions to providing open space and recreation facilities in Tysons. Creative urban park initiatives may include rooftop parks, unique programming areas, recreation facilities and program space provided within commercial buildings, redevelopment at nearby existing parks, and forging new park-provider partnerships. With any of these creative approaches, visual and physical accessibility to the public is essential.

The vision for Tysons calls for a "green network," or a comprehensive system of parks and open spaces that connects all the districts within Tysons through greenways. The network will integrate large and small urban parks with existing environmentally sensitive areas and other built elements to create safe pedestrian and bicycle-friendly pathways throughout all neighborhoods. These pathways will link to transit stations, pedestrian ways, bike trails, shopping and entertainment areas, offices and residential areas. The green network should build on existing parks and the creation of new urban parks. It will include large gathering places that support community events, such as a central, signature park. The green network will have sufficient publicly accessible park acreage to be consistent with the County's adopted urban park service level standard.

Green Network Components

The system of parks and open space is envisioned to build on the foundation of a large, central, "signature" park, existing parks and the creation of new urban parks. The parks and open space network concept is shown in Map 9. This map includes some existing areas associated with residential developments that are not publicly accessible. Specific guidance on parks, recreational facilities and trails is provided in the District Recommendations.

The types of parks and open space recommended for Tysons include:

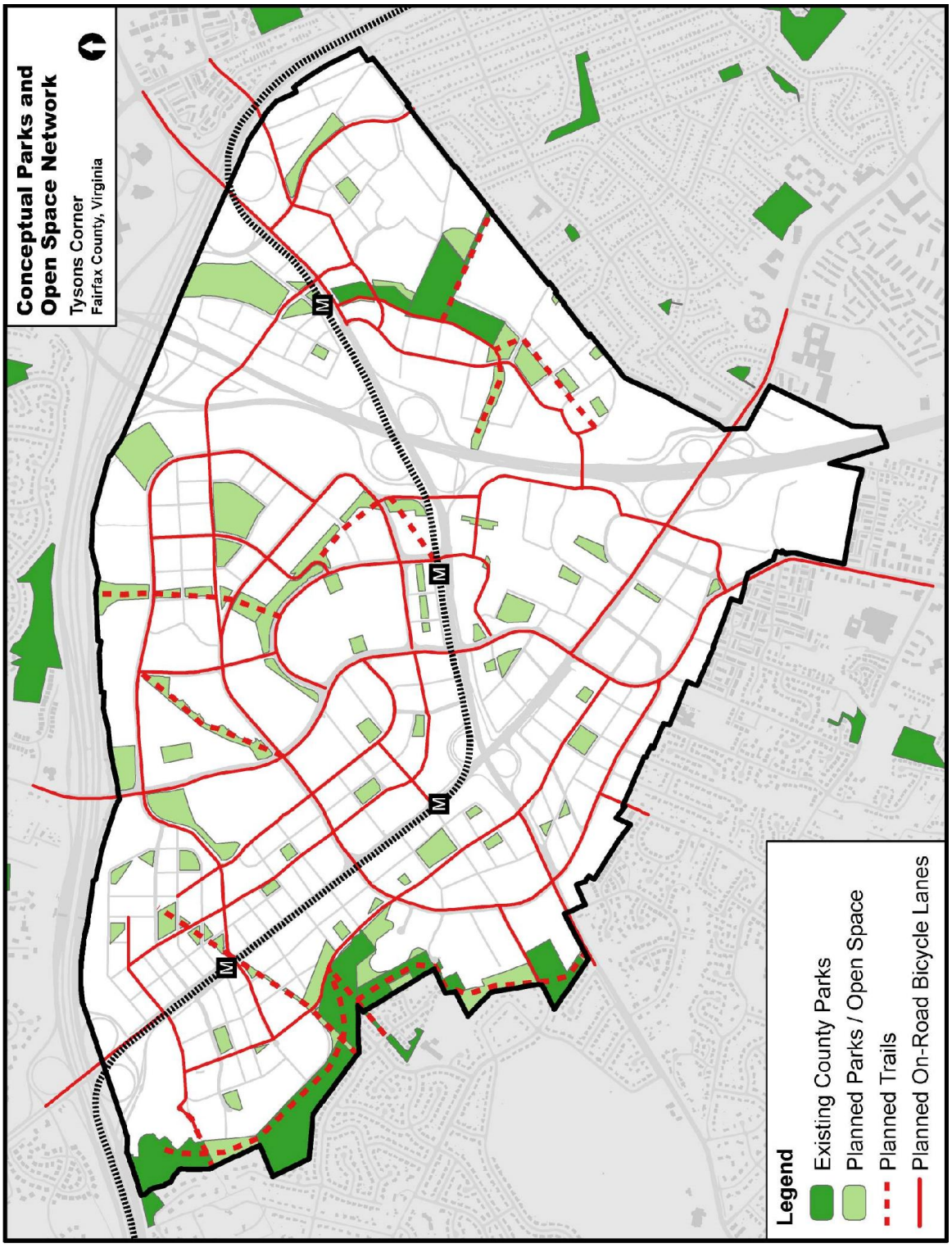
Large Central Park: This will be the "signature" park for Tysons and should be large enough to support public, community, and cultural events, such as a farmers market, outdoor performances, art shows or weekend festivals. Ideally, this park should be co-located with other civic facilities such as museums, a performing arts center, library, or other major civic uses.

Existing Stream Valley Parks: Stream valley parks such as Scotts Run and Old Courthouse Spring Branch provide natural buffers and potential connectivity to and throughout Tysons. If linked to other parks and open spaces within Tysons, they will help serve non-motorized transportation needs. These stream valley parks should not only be protected from development and infrastructure impacts, but be restored and enhanced. Redevelopment in Tysons should contribute to stream and riparian buffer restoration efforts along these stream valleys in order to strengthen Tysons' existing natural systems and allow for resource protection and interpretation. These stream valley parks can be expanded through dedications of privately-owned portions of the stream valley and in adjacent areas to provide better connectivity. They can serve as major linear urban parks and support the planned trail system with a variety of natural landscapes. These parks will provide a variety of passive outdoor leisure experiences for residents, visitors and workers in Tysons, including outdoor exercise and enjoyment of quiet natural spaces.

Trail Network: The conceptual trail network is included in Map 9. This network will be designed for frequent use through continuous lengths of outdoor trails or spaces that are a minimum of eight feet wide and may include amenities and/or design features such as trailheads, orientation features and wayfinding signage. These linear parks and trails will be popular for jogging, dog walking, biking, walking, enjoying the outdoors and general exercising. The space along the Metro rail provides an opportunity to create a "Green Artery" linear park to link the four stations with a pedestrian and bicycle path that could weave under and along the Silver Line. Connecting continuous linear spaces with the grid of streets in Tysons provides an important amenity that can be linked with pedestrian and bicycle street elements. The County will pursue lighting of certain trails that provide Metro access and will consider other services to keep trail access open during winter months. The "Tysons Community Circuit" recreational trail loop as proposed along existing and planned roads will be a combined recreational and transportation feature that will add to the diversity of options available for moving through Tysons. The *Tysons Park System Concept Plan* describes features of and implementation strategies for "The Circuit" in greater detail. ~~The street network in Tysons will incorporate Low Impact Development in medians and rights-of-way for additional environmental benefits. In addition to being green, streets will also be "complete," with walking and jogging trails and bicycle paths.~~

Cultural Resource Parks: Freedom Hill Park and Ash Grove Historic Site provide historical points of interest in small park settings. Signs, kiosks and other interpretive features may be incorporated into new urban parks in Tysons to preserve and interpret the history of Tysons as it has evolved from rural crossroads to suburban office park to twenty-first century city.

Multiple Urban Parks: A diversity of public spaces ranging in size, function, and character, and supporting formal and informal activities, will be located throughout Tysons. Locating parks adjacent to residential and mixed use buildings will enhance these uses by providing common outdoor spaces to users who have no private yards. Integration of parks with residential and mixed use developments will also provide "eyes" on streets and parks for a sense of public safety and activity focused on the park. All parks should be publicly accessible to residents, visitors and workers.



MAP 9

***This map does not reflect the latest edits. All maps in the Areawide Recommendations will be edited and presented when the entire Plan Amendment is presented for review.**

Within urban, transit oriented development areas, a full complement of urban park types is desirable to create a robust park network and strong sense of place for Tysons. Urban park design elements may be combined in various ways to create a range of urban park types. Urban park types range from the very small "pocket park" situated as a byway on a pedestrian-oriented travel way, to large civic open spaces that encompass diverse amenities and accommodate large community gatherings, to local parks that provide opportunities for organized sports and informal play. Ideally, the park network in Tysons will include a complement of urban park types in order to serve local leisure needs; support environmental and sustainability goals; and contribute to the area's sense of culture, liveliness and identity.

Urban Park Typology

The Urban Parks Framework, found in the Policy Plan, sets forth a~~A~~n urban park typology and urban park service level standards that guide the creation of urban park systems in Fairfax County. The ~~u~~Urban P~~p~~arks F~~f~~ramework for Fairfax County includes ~~four~~ five distinct types of urban parks: pocket parks, common greens, civic plazas, ~~and~~ recreation-focused urban parks, and linear parks (see definitions below). The ~~four~~ five urban park types span a continuum of purposes, uses, sizes and features that can flexibly accommodate a broad spectrum of recreational and leisure pursuits in Tysons. A distinction should be made between urban parks that align with the typology and urban design elements such as streetscape areas, sidewalk cafes, commercial entertainment venues, and retail browsing areas.

Pocket Park

Usually less than one-third acre, these urban parks are small-scale open spaces incorporated into developments and designed for casual use by people working and living in the immediate area. A pocket park is designed as a single "room" to provide limited casual open space to enjoy individually or in social interactions. These spaces may consist of hardscape elements or lawn and landscaped areas, seating and visual amenities.

Common Green

Larger than pocket parks, these urban parks include flexible open spaces with open lawn areas, serving as the recreation and social focus of a neighborhood or larger area. Size generally depends on the context, function and area, but should be a minimum of one acre. Although a central lawn is the main focus of this type of park, it may be designed with multiple "rooms" offering a mix of complementary uses and/or large enough to support multiple simultaneous activities. The Common Green could function as unscheduled open space for uses such as picnicking and unstructured play or be programmed for athletics, public gatherings, performances and special events. The Common Green may include facilities such as off-leash dog areas, community garden plots, landscaping, water features, shade structures, gathering areas, amphitheaters, space for public art, and/or hardscape areas. Recreational amenities may be incorporated as complementary facilities, but do not predominate. Examples of recreational facilities include tot lots and playgrounds, small skate parks, fitness courses and paved trails, and sport courts.

Civic Plaza

An important feature of the park network will be a centrally located civic gathering plaza in each district. This publicly accessible park includes public art and multiple activity areas and is large enough to support casual unprogrammed use as well as community events. This type of urban park includes public gathering spaces set aside for civic purposes and commercial supporting activities. Civic plazas are usually located at the intersection of important streets or

other significant locations and serve as a focal point and unique placemaking feature. Public squares that are surrounded by public streets are also an example of this type of urban park. Flexible, programmable spaces in multiple "rooms" are generally included. Design includes primarily hardscape elements, but may include trees or other landscaping, seating, public art or water features. Size generally depends on the context, function and area, but should be a minimum of one acre. Depending on size, civic plazas could support open air markets, concerts, festivals, outdoor exercise classes or special events. Recreation amenities may be incorporated as complementary facilities, but do not predominate.

Recreation-focused Urban Park

Appropriate recreation facilities will serve a variety of needs and add to the vibrancy of Tysons. In densely-populated urban areas, recreation needs should be addressed with the inclusion of recreation facilities in an urban park setting to serve local residents, visitors and workers. This park type is distinguished by its primary function to provide recreation facilities for nearby residents and workers. Facilities such as athletic fields, multi-use courts and skate parks should be provided. Facilities could be scheduled or casually used. Athletic fields which may be located at grade or on garage and building rooftops should have synthetic turf and lighting to maximize use. Support facilities and amenities such as trails, seating, tot lots, shade structures, water features, picnic areas, restrooms, landscaping or hardscape should be provided to complement the recreational component. Parking needs should be addressed through shared parking agreements with adjacent developments. The size of the park should be appropriate to accommodate the recreation facilities and support amenities located there.

Linear Park

Linear parks are characterized by an elongated shape and usually occur in an area between destinations or points of interest and/or along streams, and frequently double as pedestrian connections. These parks can serve many ~~different~~ purposes including providing a variety of recreation facilities (e.g., fitness stations, dog exercise areas). Creation of continuous linear spaces for recreation provides an important amenity that can be linked with pedestrian and bicycle street elements. Linear parks can also provide opportunities for resource protection and can provide natural areas with trails and waysides for a combination of active and passive enjoyment. Linear greenways that utilize urban stream valleys for trails and trail connections are one such form of linear park.

The size and design of linear parks varies and depends on its context, function and area. Again, these parks frequently link other urban elements and may function as a green spine through an urban area. Due to the variety of linear parks, typical facilities will vary but will generally consist of a continuous multi-use trail, waysides and seating, and other active and/or passive recreation components.

~~ENVIRONMENTAL STEWARDSHIP~~PARKS AND RECREATION GUIDELINES

These guidelines should be considered along with the general ~~Environmental Stewardship~~Parks and Recreation recommendations above, in evaluating development proposals in Tysons.

~~Parks and Open Space~~

Map 9 provides a conceptual plan for a wide-ranging and well-distributed park and open space network in Tysons. It is essential that there be a balanced park system that will support social and recreational needs. Social gathering places and pleasant outdoor spaces will comprise a greater proportion of urban parks in Tysons and can be more easily integrated within developments as an amenity. However, there should be a distinction between urban parks that provide a public benefit aligning with the typology below, and elements such as streetscape areas, sidewalk cafes, commercial entertainment venues and retail browsing areas. It will be more difficult, but no less important, to provide park land in Tysons that will support active recreation facilities such as athletic fields for use by Tysons' residents, community leagues and corporate teams. There will be a great need for these facilities in Tysons and they should be well distributed within Tysons to serve each district.

The provision of land should be proportionate to the impact of the proposed development on park and recreation service levels. An urban park land standard of 1.5 acres per 1,000 residents and 1 acre per 10,000 employees will be applied. For example, a new development with ~~330~~ about 380 dwelling units or 3,000,000 square feet of office space would generate a need for about 1 acre of publicly accessible urban park space.

Urban parks are typically less than five acres and often under 1/2 acre. Service areas are generally within a 5-10 minute walking distance (or 1/4 – 1/2 mile) from nearby offices, retail and residences. Typically, on-site parking is only provided for the more intense recreation uses that are located more than 1/4 mile from transit.

In addition, recreational facility service level standards in the Park and Recreation element of the Countywide Policy Plan should be applied to new development in Tysons, with adjustments made for urban demographics and use patterns. Using 2050 development projections, anticipated urban field use patterns, optimal athletic field design (lights and synthetic turf) and longer scheduling periods, the adjusted need for athletic fields to serve Tysons is a total of 20 fields. This adjusted need should be addressed through on-site development of needed facilities and/or through equivalent monetary or in-kind contributions to the Park Authority for facility development at nearby parks or other sites appropriate for park facilities. In general, the need for an athletic field is generated by the development of approximately 4.5 million square feet of mixed use development in Tysons. Approximately two acres of land is needed for each full size athletic field. Additional space may be needed for support facilities such as parking, restrooms, warm up areas, etc.

Proposed development in Tysons should be accompanied by the dedication of public or publicly accessible parkland, and by the construction of recreational facilities, such as athletic fields. Provision of park land and facilities on-site is preferred. If on-site dedication and facility provision are not possible, an equivalent off-site dedication and facility construction within the same district should be sought as a substitution. Where it is not possible to locate facilities within the district, locations that serve Tysons may be substituted. As a last alternative, as for smaller sites, an equivalent monetary contribution to fund local public parks within Tysons may be substituted. If facilities are constructed on publicly-owned land, an offsetting contribution of park facilities, park land or cash contribution for parks equivalent to the value of the land used for construction should be provided.

Creative approaches can be used to ensure provision of recreational facilities, especially athletic fields that meet service level standards. This may include indoor and rooftop facilities or those located above underground stormwater management facilities. Co-location with other public facilities is also appropriate. Redevelopment proposals should make every effort to meet the need for new urban parks onsite, according to the acreage standards noted above. Proposals

will be evaluated not only in terms of the quantity of park area provided, but also based on the location, types and quality of public park spaces. In cases where there is a shortfall of needed onsite park space, offsite park improvements may be considered. Offsite areas could include improvements to transit station plazas, public easements and rights of way, as well as restoration and enhancement of nearby stream valleys.

Facilities that contribute toward meeting the parks and open space needs in Tysons may be privately owned and privately developed. Regardless of ownership, newly created parks and open space and existing parks and open space that are redesigned in conjunction with a redevelopment project should be publicly accessible during appropriate hours and should meet or exceed the same service level standards as any publicly owned and developed parks or open spaces. The Conceptual Land Use and Parks and Open Space maps include some existing areas associated with residential developments that are not publicly accessible.

~~Stormwater Design~~

~~Environmentally-friendly stormwater design should be an integral design principle that should be part of the conceptual stage of site development for all redevelopment, recognizing that stormwater management measures may be phased with development. The stormwater design should first seek to minimize the effect of impervious cover, followed by the application of stormwater reuse, retention, detention, extended filtration and, where soils and infrastructure allow, infiltration to improve downstream waters. The incorporation of stormwater management strategies in parks and other open space areas within or adjacent to the Tysons Corner Urban Center may also support this approach while providing recreational amenities. Coordination of stormwater management controls among multiple development sites may also be effective in achieving stormwater management goals in an efficient manner. This could include the construction of new regional ponds or modifications to existing regional ponds.~~

~~Stormwater management and water quality controls for redevelopment should be designed to return water into the ground where soils are suitable or reuse it, where allowed, to the extent practicable. Reduction of stormwater runoff volume is the single most important stormwater design objective for Tysons. Reduction could occur through techniques that use plants or soils via landscaping measures, through techniques that reuse harvested rainwater in a variety of ways, and/or through approaches that infiltrate water into the ground to replenish aquifers and provide summer base flows to local streams.~~

~~Redevelopment projects in Tysons should incorporate innovative stormwater management measures in a manner that will, first and foremost, optimize reduction of stormwater runoff volume and control of peak flows for the remaining stormwater that cannot be completely captured on-site.~~

~~The following are recommended for applications for which a significant increase in density/intensity is proposed (e.g., a redevelopment option is being pursued):~~

- ~~Stormwater quantity and quality control measures should be provided that are substantially more extensive than minimum requirements, with the goal of reducing the total runoff volume and/or significantly delaying its entry into the stream system. The emphasis should be on Low Impact Development (LID) techniques that evapotranspire water, filter water through vegetation and/or soil, return water into the ground or reuse it.~~

- ~~LID techniques of stormwater management should also be incorporated into new and redesigned streets where allowed and practicable.~~

- ~~At a minimum, the first inch of rainfall should be retained on-site through infiltration, evapotranspiration and/or reuse. If, on a given site, the retention on-site of the first inch of rainfall is demonstrated not to be fully achievable, all available measures should be implemented to the extent possible in order to support this goal and achieve partial retention of the first inch of rainfall.~~

- ~~At a minimum, stormwater management measures that are sufficient to attain both the stormwater design-quantity control and stormwater design-quality control credits[3] of the most current version of the LEED-NC or LEED-CS rating system (or the equivalent of these credits) should be provided. If, on a given site, the attainment of the stormwater design LEED credits (or equivalent) is demonstrated not to be fully achievable, all available measures should be implemented to the extent possible in support of this goal.~~

- ~~Equivalent approaches may incorporate coordinated stormwater management on multiple development sites and/or off-site controls. Additional stormwater management efforts should be encouraged.~~

- ~~Restoration and/or stabilization of degraded streams on development sites should be pursued where feasible; restoration and stabilization techniques that incorporate ecologically and aesthetically beneficial, vegetated approaches are preferred. Off-site efforts to restore and/or stabilize streams in Tysons Corner should also be encouraged.~~

~~The above guidelines are intended to improve stormwater management controls sufficiently to allow for improvements to the habitat and recreational values of streams in Tysons Corner through natural restorative processes and/or through restoration projects.~~

~~Green Building Design and Energy/Resource Conservation~~

~~Existing Fairfax County policy calls for certain zoning proposals for nonresidential development and multifamily residential development of four or more stories in urban centers to incorporate green building practices sufficient to attain LEED certification or its equivalent. Nonresidential development in Tysons should go one step further and seek LEED Silver~~

~~2 These credits, as set forth in LEED 2009 for New Construction and Major Renovations, are as follows:~~

~~**SS Credit 6.1: Stormwater Design Quantity Control:**~~
- ~~For sites that have greater than 50% impervious cover in the existing condition, the total volume of runoff released from the site in the post-developed condition for the 2-year, 24-hour storm should be at least 25% less than the total volume of runoff released in the existing condition for the same storm. Furthermore, the peak runoff rate for the 2-year, 24-hour storm in the post-developed condition should be at least 25% less than the existing condition peak runoff rate for the same storm.~~
- ~~For sites that have 50% or less impervious cover in the existing condition, the total volume of runoff released as well as the peak release rate for the 1- and 2-year, 24-hour storm in the post-developed condition should be equal to or less than the total runoff volume and peak release rate in the existing condition for the same storm. Alternately, a stormwater management plan that protects receiving stream channels from excessive erosion, including stream channel protection and quantity control strategies, may be pursued.~~

~~**SS Credit 6.2: Stormwater Design Quality Control:**~~
- ~~Stormwater runoff associated with the development should be controlled such that the first one (1) inch of rainfall is reused, infiltrated or treated in a manner through which 80% of the average annual post-development total suspended solids (TSS) are removed.~~

~~certification or equivalent as a minimum. Residential development should be guided by the Policy Plan objectives on Resource Conservation and Green Building Practices.~~

~~All redevelopment projects in Tysons should incorporate design elements and practices that will reduce the use of energy and water resources. There are numerous strategies available that are outlined in green building rating systems such as the LEED program, and strategies such as these should be pursued in support of or in addition to efforts to attain LEED Silver certification or its equivalent. The following are examples of efforts that could be pursued:~~

- ~~Transit-oriented development design~~
- ~~Transportation demand management programs~~
- ~~On-site renewable energy generation, such as solar, wind and/or geothermal systems~~
- ~~If/when on-site renewable energy generation is not cost effective at the time of building design, the provision of building designs that will facilitate future retrofits for on-site energy generation if/when such efforts will become cost effective~~
- ~~Orientation of buildings for solar access~~
- ~~Energy-conscious landscape design (e.g., natural landscaping; shading)~~
- ~~Water-efficient landscaping~~
- ~~The use of energy efficient heating, ventilation and air conditioning systems~~
- ~~Enhanced building commissioning to provide early and ongoing verification of system performance~~
- ~~The use of energy efficient lighting systems~~
- ~~The use of energy conserving building materials~~
- ~~The provision of vegetated and/or highly reflective roofs~~
- ~~The use of community energy distribution systems through which energy/heat generated on one site will be shared among buildings on other nearby sites~~
- ~~The use of water-conserving plumbing fixtures~~
- ~~The use of harvested stormwater runoff for irrigation~~
- ~~Where consistent with building codes, the use of grey water~~
- ~~The use of information and communications technology to improve the efficiency and economy of building operations.~~
- ~~If/when the provision of information and communications technology efforts is not cost effective at the time of building design, the design of buildings to include conduits supporting the future installation of such measures~~

~~Setting Future Environmental Goals for Tysons~~

~~Tysons should endeavor to remain the leader in environmental stewardship. As such, the Plan should include flexibility to accommodate new strategies and technologies as they emerge, such as district energy systems, alternative energy sources, cogeneration, microgrids, district-scale environmental performance measures, innovative stormwater management and stream restoration practices, innovative green building practices and innovative approaches in the provision and design of park facilities and other open spaces. In order to encourage the use of~~

~~new technologies as they become available, the Environmental Stewardship Guidelines will need to be regularly reviewed and updated.~~

PUBLIC FACILITIES

Making Tysons a livable place requires the provision of public services, infrastructure and utilities at a sufficient level for the envisioned urban environment. In this section, the public facilities anticipated to serve growth in Tysons through the year 2050 are identified, along with the anticipated time frame for the provision of these facilities. Because growth rates will vary over time, the population, employment and household thresholds referenced below may be reached in different years. Actual growth levels should be monitored so that infrastructure capacity is phased with new development. Regardless of the rate of growth, commitments for the land for needed facilities should be obtained well in advance of the estimated date of construction. All public facilities should also be considered as adaptable spaces in mixed-use settings to serve both residents and workers in Tysons. Flexibility in design is encouraged to accommodate temporary community uses such as polling places and mass care shelters. The Guidelines at the end of this section provide additional information on the phasing of public facilities. Information on transportation facilities is found in the Transportation section of the Areawide Recommendations

SCHOOLS

~~The~~ Tysons ~~Corner Urban Center~~ area is currently served by a total of ~~ten~~ twelve public schools. There are four elementary schools: Freedom Hill, Spring Hill, Westbriar, and Westgate. Tysons is served by ~~three~~ four middle schools: Cooper, Kilmer, ~~and~~ Longfellow and Thoreau. Finally, there are ~~three~~ four high schools: Langley, Madison, Marshall and McLean.

Under the envisioned growth for Tysons, there will be a need for at least two new elementary school sites in Tysons. One school could be located in the North Central district where it could share recreational space with the proposed eight to ten acre park. Another school could be located in the East Side district. Additionally, one or more of ~~The~~ the existing ~~Westgate E~~elementary ~~School~~ schools serving Tysons could be expanded. ~~Consistent with the vision of a more urban Tysons, an elementary school could also be located in a commercial office building, provided that all access, safety, security and play space requirements are met.~~

An elementary school has a capacity for 950~~00~~ students. The existing households in Tysons generate 400 elementary students. Between 2010 and 2030, projections call for 12,900 new households in Tysons. This number of new households will generate an additional 555 elementary students, resulting in a need for the first elementary school by 2030.

~~———~~Between 2030 and 2050, projections call for another 20,700 new households in Tysons. This number of new households will generate an additional 890 elementary students, resulting in a need for the second elementary school by 2050.

A middle school has a capacity for ~~1,250~~1,350 students. Between 2010 and 2050 there are projected to be a total of 33,600 new households in Tysons. This number of new households will generate an additional 370 new middle school students. For purposes of long-range planning, ~~expansion of~~capacity enhancements at one or more of the middle schools serving Tysons ~~(Kilmer or Thoreau)~~ is projected to be needed by the year 2050. ~~Pimmit Hills Alternative High School may in the future be considered for use as an elementary or middle school. A secondary school may also need to be considered.~~

A high school has a capacity for ~~2,000~~2,500 students. Between 2010 and 2050 there are projected to be a total of 33,600 new households in Tysons. This number of new households will generate an additional 806 new high school students. For purposes of long-range planning, ~~expansion of~~capacity enhancements at ~~the existing~~one or more of the high schools serving Tysons ~~, Marshall,~~ is projected to be needed by the year 2040.

Pimmit Hills Center may in the future be considered for use as an elementary or middle school. A secondary school may also need to be considered. Further, consistent with the vision of a more urban Tysons, an elementary school, or other school use, could also be located in a commercial office building, provided that all access, safety, security and play space requirements are met.

LIBRARY

Tysons is currently served by the Dolley Madison and Patrick Henry Community Libraries, and the Tysons-Pimmit Regional Library. Growth in Tysons will generate the need for a new community library when the number of residents in Tysons reaches 50,000, or between 2030 and 2040. The recommended site would be near the Tysons Central 7 Metro station, with possible co-location with a community center or a performing arts center.

Another consideration would be replacement of the existing regional library, which has limited usable public space, with a new regional library in Tysons Central 7. A regional library could also be co-located with a community center or performing arts center. The current site of the Tysons-Pimmit Regional Library could be used for another public purpose.

FIRE AND RESCUE

Emergency services to Tysons are currently provided by Tysons Fire and Rescue Station 29 and Dunn Loring Fire and Rescue Station 13. Two new fire stations are currently planned, including a replacement of Station 29 near the Spring Hill Metrorail station and a free standing station. Approximately 22,000 square feet of space for a two-level fire station including dedicated garage parking spaces will be constructed and dedicated in a new high-rise residential building by 2020 with options for a stand-alone station. Another station will be provided in the

Tysons East District where a freestanding 15,000 square foot two-level fire station including surface parking is to be constructed and dedicated by 2020. A third fire station in Tysons is also needed in Tysons Central 7 or Central 123 with future population increases. ~~The higher intensity of development and taller buildings at the transformed Tysons will require two new urban fire stations. These stations could be located on the first two to three floors of commercial or mixed use buildings. In order to maintain an adequate response time for emergency medical services, the first station will be needed by 2020, or when the number of residents reaches 31,400 and the number of jobs in Tysons reaches 140,300. The first station could be located in the Tysons Central 7 or Tysons Central 123 district.~~

~~The second station will be needed by 2040, or when the number of residents reaches 64,000 and the number of jobs in Tysons reaches 188,600. The second fire station could be located in the Tysons East district.~~

~~Because the existing Station 29 is adjacent to the Tysons West Metrorail station, it is planned for relocation to the edge of the North Tysons West Subdistrict or to co-locate with the Spring Hill Transit Center in the North Central District. Relocation of Station 29 will take place regardless of the level of development in Tysons, and is therefore considered an existing need.~~

POLICE

Tysons is currently served by the McLean Police District. The projected workload due to growth in Tysons will exceed the capacity of the current staff by the year 2025. In order to provide a strong, visible police presence in Tysons, a ~~satellite~~ police station should preferably be located near the central Metro station areas. ~~Such a station could be co-located with the Fire and Rescue station in the Tysons Central 7 or Tysons Central 123 district, which is due for construction by the year 2020.~~ The new station could be co-located with the third Fire and Rescue station due for construction by 2040. Prior to construction of the new station, it would be desirable to have office space to accommodate approximately 20 officers and civilians in Tysons. There should also be at least one publicly accessible helipad for emergency services in Tysons.

PARKS

The Fairfax County Park Authority (FCPA) ~~currently~~ owns~~ed~~ about ~~86~~ 89 acres of park land in 2014 within the boundaries of Tysons. An urban park standard of 1.5 acres per 1,000 residents and 1 acre per 10,000 employees should be used to determine proportionate contribution levels for urban park land. The proposed Tysons park system should include a mix of small urban pocket parks of less than one acre, one to five acre civic plazas and common greens, and two to ten acre recreation-focused urban parks. One of the civic plazas should be a centrally located signature park. The green network in Tysons will also include linear open spaces, trails, and other non-motorized linkages including the Green Artery under the Metro rail, and the Tysons Community Circuit recreational trail loop along the grid of streets.

In addition to land for urban parks, land for active recreation and trails will be needed to serve growth in Tysons and should be provided by new development.

The Countywide recreation facility service level standards in the Park and Recreation element of the Countywide Policy Plan should be applied to new development in Tysons, with adjustments made for urban demographics and use patterns. Provision of facilities to meet these service level needs will ensure that as Tysons redevelops, publicly accessible athletic fields, tennis courts, basketball courts, fitness and program space, swimming pools, and other active

recreational facilities will be provided at levels meeting the needs of future Tysons residents, employees and visitors. Using 2050 development projections, anticipated urban field patterns, optimal athletic field design (lights and synthetic turf) and longer scheduling periods, the adjusted need for athletic fields to serve Tysons is a total of 20 fields.

Some of the active recreational facility needs may be accommodated by adding or upgrading facilities at existing public school sites or in nearby existing parks surrounding Tysons. However, most future active recreational facilities will need to be provided within Tysons' redevelopments. In addition, trails should be provided in accordance with the County's adopted Trails Plan and the Conceptual Connectivity Map on page X. Trails should also connect open space to the grid of streets, in accordance with specific guidance in the District text.

See the Areawide Parks and Recreation ~~section of the Areawide Environmental Stewardship~~ recommendations for full guidance on urban parks, trails and urban active recreational facilities. Guidance on location of specific facilities is also provided in the District text. The Park Authority's *Tysons Park System Concept Plan* is a supplemental guide to implementation of the park and open space network.

~~STORMWATER MANAGEMENT~~

~~The vision for Tysons includes stormwater management practices that return water into the ground, reuse it, or delay its entry into the stream system. All redevelopment sites should be designed to ensure protection of downstream areas and prevent stream degradation. Environmentally friendly stormwater design should be included at the conceptual stage of design on all redevelopment projects. Low Impact Development (LID) techniques should be integrated into streetscapes, open space, buildings and rail. These techniques include rain gardens, vegetated swales, porous pavement, vegetated roofs, and tree box filters. LID techniques should be augmented by conventional detention practices such as ponds where needed and appropriate. Vegetated ponds can be considered both as a stormwater management technique and an aesthetic amenity. Consideration should be given to reuse of stormwater as grey water, in order to reduce consumption. See the Stormwater section of the Areawide Environmental Stewardship recommendations for full guidance on stormwater management.~~

WASTEWATER MANAGEMENT

Wastewater from Tysons is treated at the Blue Plains Treatment Plant, which is owned and operated by the DC Water and Sewer Authority (dba DC Water). In order to accommodate growth in Tysons and elsewhere in Fairfax County, the County has purchased one million gallons per day of capacity at the Loudoun County Sanitation Authority's (dba Loudoun Water) wastewater plant. ~~is pursuing the purchase of additional treatment capacity at Blue Plains and at the Loudoun County Sanitation Authority. However, it is not yet known how much additional capacity could be made available to the County at this time.~~ Most likely, the additional wastewater from Tysons will have to be diverted to other treatment plants such as the County's Noman Cole plant or the Alexandria Sanitation Authority's (dba AlexRenew) plant, ~~in both of~~ which have ~~there is some~~ adequate available capacity.

Over time it is expected that the adoption of water conservation measures will result in less water consumption and less wastewater production by County residents. In any case, growth

in Tysons will generate the need to increase the capacities of major trunk lines, to upgrade the Difficult Run Pump Station for diversion of flow to the Noman Cole or the AlexRenew plants, and to invest in other improvements to the current wastewater system.

WATER

~~The Tysons area is currently served by both the Falls Church Department of Public Utilities and Fairfax Water. Fairfax Water has a major pumping station providing for transmission through Tysons Corner as well as local distribution at their existing facilities on International Drive.~~

~~Fairfax Water has identified future improvements to provide for both transmission through Tysons to eastern Fairfax County as well as for local service to Tysons itself. The timing of these improvements is subject to change based on the timing of development and opportunities for cost savings, such as constructing facilities concurrent with roadway projects. It must also be noted that the precise location of needed facilities may be modified as circumstances warrant.~~

~~Expansion plans to meet local distribution needs based on current population estimates include additional storage tanks in 2030 and 2040, two additional distribution pumps in 2010 and one distribution pump in each of 2020 and 2030. A northerly 24- or 36-inch main from Spring Hill Road along Greensboro Drive and Galleria Drive to Fairfax Water's 42-inch main along the~~

~~Capital Beltway, or the hydraulic equivalent, and a southerly 24- or 36-inch main from Fairfax Water's 24-inch main from the Route 7/Dulles Toll Road interchange to Gosnell Road and along Old Courthouse Road, or hydraulic equivalent, have been identified for installation concurrent with development.~~

~~Several transmission mains through Tysons have also been identified to meet future needs. The Spring Hill Road water main will be extended to the existing Fairfax Water facilities on International Drive. Fairfax Water also plans to extend water mains from its pumping station to Magarity Road, from its treatment facilities in Dranesville to Tysons, and along route 7 from Route 123 to its existing main in Gallows Road. Construction of these facilities will enable Fairfax Water to provide full transmission capacity to serve all of Tysons. Specific details pertaining to water distribution infrastructure would be developed during the requisite site plan engineering process.~~

~~Falls Church Water recently upgraded their storage capacity at Tysons to 2.2 million gallons. Among their plans for capital improvements in Tysons are the installation of 24-inch and 16-inch water mains by the year 2020. By the year 2030 Falls Church Water plans to install another 24-inch main to serve Tysons.~~ On January 3, 2014, Fairfax Water acquired the water system previously owned by the City of Falls Church to become the sole water service provider in the Tysons area. Major facilities within the study area include the following:

- Transmission water mains ranging in size from 16 to 54-inches in diameter;
- Four water storage facilities; and
- Four pumping stations.

Fairfax Water has initiated an integration study to plan for the most efficient operation of the combined water systems. The plan is still a work in progress; however, several future improvements to provide for both transmission through Tysons to eastern Fairfax County as well as for local service to Tysons itself have been identified. The timing of these improvements is

subject to change based on the timing of development and opportunities for cost savings, such as constructing facilities concurrent with roadway projects. It must also be noted that the precise location of needed facilities may be modified as circumstances warrant.

Several projects within Tysons have been identified to meet future needs, including the following:

- 24-inch main from Spring Hill Drive, along Jones Branch Drive, Park Run Drive and Westpark Drive to the 24-inch main near the I-495/Chain Bridge Road interchange;
- 24-inch main from the Tysons II storage and pumping facilities along International Drive, Westpark Drive, Greensboro Drive to the 24-inch main that runs along Route 7;
- 24-inch main from the Lewinsville water storage tank (Chain Bridge Road & Dulles Toll Road) to the Scotts Run Pumping Station (Dolley Madison Boulevard and I-495);
- 24-inch main from the Scotts Run Pumping Station along Old Meadow Road to the 24-inch main along Magarity Road;
- 16-inch main from the Town of Vienna's Wall Street Tank, along Gosnell Road to the 24-inch main along Route 7;
- 16-inch main along the Dulles Toll Road corridor to the 24-inch main that runs along Route 7;
- Development of additional water storage facilities; and
- Development of additional pumping facilities.

ELECTRIC POWER

Dominion Virginia Power's existing Tysons substation is located on Tyco Road. It will be able to support approximately one third of the expected growth for Tysons ~~will be expanded to serve approximately 400 MVA (megavolt-amperes) for normal operating conditions~~. By the year 2050, Dominion projects that growth in Tysons will generate demand for 738 MVA.

~~Therefore, a~~ A second substation (Spring Hill Substation) is planned for the year 2020, with a preferred location south of Route 7 near Spring Hill Road, adjacent to Dominion's existing high transmission line. A third substation (Jones Branch Substation) is planned for 2030 with a preferred location in the North Central District / northeast Jones Branch Drive area, adjacent to the Toll Road and proximate to Dominion's existing high voltage line on the north side of the Toll Road. ~~The new facility~~Both new facilities will be ~~a~~ conventional walled substations and will require up to 2.5 acres of land. Consolidation with adjacent development, with coordinated access and stormwater management, may significantly reduce the acreage required for these substations.

~~The new Spring Hill Substation will serve the Tysons West and Tysons Central 7 Metrorail stations, as well as development along the south side of Route 7, and Tysons Corner Center. The existing Tysons Substation will serve the Tysons Central 123 and Tysons East Metrorail stations, as well as development on the north side of Route 7, the Gannett Building and Tysons Galleria.~~

~~From the second substation to the existing substation on Tyco Road, Dominion's high voltage line should be placed underground, in order to ensure a pedestrian friendly environment. As an alternative to underground placement, the high voltage line could be relocated to an alignment away from the Metro station entrance.~~ The existing Tysons Substation on Tyco Road

will generally serve the north side of Route 7 west of Route 123. The new Spring Hill Substation will generally serve the south side of Route 7, west of the 495 Beltway. The new Jones Branch Substation will generally serve the northern and eastern portions of Tysons.

In order to ensure a pedestrian friendly environment and to promote a logical pattern of development, Dominion's high voltage line between the existing substation on Tyco Road and the new Spring Hill Substation should be placed underground. As an alternative to underground placement, the high voltage line could be relocated to an alignment away from the Metro station entrance.

NATURAL GAS

Washington Gas serves Tysons through a gate station in the Dranesville area. This gate station is very centrally located in the region's system of gas pipelines, and is considered to be in a "healthy" condition. By 2050, growth in Tysons is projected to increase output in this gate station by 50%. This assumes high-rise, multifamily housing units, which consume about one-fourth as much gas as single family units. In the unlikely event system improvements are needed as a result of growth in Tysons, any such improvements will be financed through the utility's rate system.

TELECOMMUNICATIONS

It is anticipated that telecommunications services will be able to accommodate growth in Tysons through continuous improvements in technology, funded by user fees. Tall buildings in Tysons should be designed to accommodate telecommunications antennas and equipment cabinets on rooftops. Such design should be compatible with the building's architecture and should conceal antennas and equipment from surrounding properties and roadways by flush mounting, screening antennas, and/or concealing related equipment behind screen walls or building features.

ARTS FACILITIES

The Tysons area is currently served by arts facilities located nearby, such as the McLean Project for the Arts, with a small theater and nationally recognized visual arts exhibits, and Wolf Trap facilities, including the 7,000 seat Filene Center, 800-seat Children's Theatre in the Woods, performing arts classes at the Center for Education at Wolf Trap, and performances at The Barns at Wolf Trap (388 seats). First Stage, a small professional theater company with limited visual arts exhibit space, is temporarily located on Spring Hill Road. To provide a 24-hour livable/walkable environment, an arts center should be provided in the South Tysons Central 7 Subdistrict. This center should include performance, rehearsal and exhibit space for local and visiting artists and/or a home for local theater or dance companies. At least one other neighborhood should include small theaters and/or galleries, as well as adaptable space that allows for the creation of visual art and for audiences and artists to interact.

PUBLIC FACILITY GUIDELINES

These guidelines should be considered along with the general Public Facility recommendations above, in evaluating development proposals in Tysons.

Phasing Public Facilities

Practices employed by the County in the past to provide space for public facilities in largely undeveloped suburban areas cannot be relied upon in an intensely developed area where most of the land is privately owned. In Tysons it will be critical that the land area or spaces for public uses are incorporated within private developments at no cost to the public sector.

While facilities may actually be constructed throughout the planning horizon based upon need, it is critical that space for most, if not all, of these facilities be secured as soon as possible. Therefore, rezoning proposals, through proffers, should commit to provide the necessary land and/or space to ensure that places will be available to construct facilities in concert with the pace of growth.

The land and/or building space needed for public facilities is critical to the assurance that such facilities can be constructed. Commitments to dedicate building space or land for most, if not all, of the public facilities needed by 2050 should be provided as development approvals occur during the first 10 or 20 years of Plan implementation.

In addition to facilitating public facility objectives through zoning actions, it may be necessary for landowners throughout Tysons to work collaboratively and creatively through private-private partnerships to meet public facility objectives. Detailed plans for the provision of public facilities, including parks and athletic fields, for a district or subdistrict should be in place prior to or concurrent with the first rezoning approval in that district or subdistrict. Such plans should enumerate the public facilities needed in that district, the proposed locations for the facilities, their anticipated year of construction, and the private sector's commitments toward the provision of those facilities. The public facilities plans should be coordinated with the County and land owners within the district or subdistrict. The locations of proposed public facilities may be placed on an "official map" as described in the Transportation section.

Public facility and infrastructure analyses should be performed in conjunction with any development application. The results of these analyses should identify needed improvements, the phasing of these improvements with new development, and appropriate measures to mitigate other impacts.

Also, commitments should be provided for needed improvements and for the mitigation of impacts identified in the public facility and infrastructure analyses, as well as improvements and mitigation measures identified in the Areawide recommendations.

Public facilities will be funded from a combination of public and private sources, including Community Development Authorities at the Tysons-wide, district and/or subdistrict levels. Financing strategies are discussed in the Implementation chapter of the Areawide plan text.

For development thresholds and estimated timing of needed public facilities based on the George Mason University High Forecast for growth in Tysons, refer to the table at the end of this section.

Additional discussion of phasing public facilities and infrastructure can be found in the Areawide Land Use and Transportation recommendations.

Public Facilities Sustainability Goals

Reduction of the per capita consumption of water, wastewater, energy and waste materials is a guiding goal of future public utilities in Tysons. New development should reduce demands on the wastewater system through the use of water-conserving plumbing fixtures and, where consistent with building codes, the use of grey water. Additional discussion of sustainability goals is included in the Environmental Stewardship section of the Areawide Recommendations.

Information and Communications Technology

All residential, commercial and public use structures in the Tysons Urban Center should be designed and equipped to enable information and communications networking. Both formal and ad hoc networks for voice, video, and data will operate throughout the Urban Center, and will connect to remote points and networks. While some networks will be open access, others will be secure. The various purposes to be served by these networks will include but are not limited to:

- **Business:** Exchanges of information and data
- **Recreation, Arts and Entertainment:** Virtual club meetings; netcasts of performances; teleprograms and computer games
- **Education:** Formal and continuing education, originating either locally or from remote locations
- **Transportation and parking management:** Signal controls; surveillance video; GPS directions to reserved parking or available open access parking
- **Energy management**: Monitoring data on electrical consumption; exporting locally produced electricity to other buildings and/or to the electrical grid
- **Resource conservation**: Monitoring data on water supply and consumption
- **Emergency response:** Notification of emergencies and provision of GPS directions to Public Safety personnel; provision of status information during grid outages, hurricanes, or other events such as terrorist attacks.
- **Library services:** Provision of secure access to customer accounts, databases and other Fairfax County Public Library information.

Table 8
~~Timing of~~ Public Facility Needs
~~Based on GMU High Forecast for Growth in Tysons~~

Type of Facility	**Commitment or Threshold**
Fire Station 29 relocation	~~N/A~~Commitment to construct, fit out and dedicate a 25,000 square foot station in a residential high-rise building by 2020 with options for stand-alone station
New Fire Station	~~31,400 residents & 140,300 jobs~~Commitment to construct, fit out and dedicate a 15,000 square foot freestanding fire station by 2020
Third Fire Station	64,000 residents & 188,600 jobs in Tysons Central 7 or Central 123

~~Satellite~~ Police Station~~, possibly co-located with New Fire Station~~	~~31,400 residents & 140,300 jobs~~**Secure temporary space before a permanent station is constructed for immediate use**
Dominion Virginia Power Substation #2	~~31,400 residents & 140,300 jobs~~Strained capacity at existing Tysons substation
Dominion Virginia Power Substation #3	Development in North Central and Central 123
Community Center	Construct and fit out 30,000 square foot community center in office building with 70-year lease option
Elementary School ~~Building~~	~~555 new elementary students based on 12,900 new households~~Commitment to dedicate land by June 30, 2015 with $600,000 for school design costs
Elementary School	20,700 new households
Expansion of Kilmer, Thoreau or Marshall schools	33,600 new households
Community Library or Regional Library (See Note 1)	50,000 residents
College/Community Space	Construct, fit out and dedicate 5,400 square foot space for public/community use such as higher learning with 50-year lease option; additional 9,500 square feet of space for possible expansion
Higher education facilities	No set threshold
Performing and Visual Arts Center	50,000 residents
Arts Office and Funding	3,500 square foot office for arts in mixed-use building with 50-year lease option and $350,000 for Master Arts Plan
~~New Fire Station~~	~~64,000 residents & 188,600 jobs~~
~~Elementary School Building~~	~~890 new elementary students based on 20,700 new households~~
~~Secondary School Expansion~~	~~1,186 secondary students based on 33,600 new households~~
Athletic Fields (See Note 2)	One field per 4.5 million square feet of mixed use development
Civic Commons	No set threshold
Indoor Recreation Space	Construct 3,000 square feet for community/recreational programming with 50-year lease option and $225,000 for fit-out costs
Two additional Indoor Recreation Spaces	No set threshold

Fire Marshal Review office space	No set threshold
Expansion of Spring Hill Recreation Center	18,000 residents

Notes:

1. New library may be co-located with an arts center in Tysons.
2. Needs for parks, recreational facilities and trails are discussed in the ~~Environmental Stewardship~~Parks and Recreation section of the Areawide Recommendations.
3. Transportation facilities are discussed separately in the Areawide Recommendations.
4. ~~Land for facilities should be acquired well in advance of year of operation. Ideally, land or spaces for public facilities should be secured by 2020 or 2030.~~