Takoma Park City Council Meeting – February 1, 2017
Agenda Item 2

Work Session

Discussion of the Committee on the Environment Background Papers and Tree Canopy Goals

Recommended Council Action

Discuss the information provided by the Committee.

Context with Key Issues

By Resolution 2017-1, the City Council recently affirmed FY 2018 Green Team Priorities. The priorities were determined by the City Council and Committee on the Environment (joined together as the Green Team). First tier priorities consist of an energy efficiency goal, a renewable energy goal and an urban tree canopy goal. A water quality goal was added to the priorities, included as part of the stormwater goal, as a third tier priority.

To assist the Council, staff, and the public in considering and working towards the goals, the Committee developed materials that provide background information. The materials are attached.

Council Priority

Environmentally Sustainable Community

Environmental Impact of Action

Pursuit of the goals will have a positive environmental impact.

Fiscal Impact of Action

To be determined.

Attachments and Links

- [Resolution 2017-1 Affirming Green Team Priorities](#)
- An Urban Tree Canopy Goal for Takoma Park? Frequently Asked Questions
- Growing Environmental Champions: Takoma Park's Trees
- Background Papers:
    - Affordable Housing/Economic Development – Building in Sustainability
    - Water Quality
    - Renewable Energy

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AN URBAN TREE CANOPY GOAL FOR TAKOMA PARK?

Frequently asked questions

In keeping with its commitments to the Sustainable Maryland program and consistent with recommendations of Arbor Day, National Forest Service, Maryland Department of Natural Resources and others, the Committee on the Environment (COE) in consultation with the Tree Commission has undertaken to develop a numerical urban tree canopy (UTC) for the City of Takoma Park. During outreach to different stakeholders, many questions have been brought up about this concept. The goal of these FAQs is to answer those questions.

What is an Urban Tree Canopy?

The tree canopy is basically the part of trees that we see when we look up. The formal definition of a UTC is the layer of leaves, branches and stems that cover the group when viewed from above.

How does this differ from urban forest trees?

In Takoma Park, an urban forest tree is defined by ordinance as a tree that measures 24 inches or more in circumference or seven and five-eighths inches in diameter at four and one-half feet above ground level. The UTC includes urban forest trees and smaller trees including trees known as understory trees. Oaks, maples and wild cherries are good examples of our urban forest trees. Understory trees include redbuds, dogwoods, and service berries.

What are the benefits of an Urban Tree Canopy?

The Alliance for Community Trees has listed many kinds of benefits from trees and urban forests. These include green infrastructure (economic, reducing storm water runoff, improving air quality, improving water and soil quality); public health (improving mental attention, reducing asthma, obesity, hospital stays, UV rays, and noise with overall improvements to physical and mental health; roads and traffic benefits (traffic calming, accident reduction, reduced road maintenance costs); business benefits, property value benefits; fighting climate change (storing carbon, reducing carbon emissions, reducing the heat island effect; lowering energy use; and benefits to wildlife and diversity.

How is Urban Tree Canopy measured?

There are many ways that are used to measure tree canopy. Some are "bottom up": They start with a physical inventory of the type and size of tree and calculate the canopy that the tree

provides. Others are "top down": They start with data gathered by satellites or airplanes and use methods like areal light and infrared photography, light detecting and ranging (LIDAR) using lasers, and computerized geographical information systems. Many scientists believe that bottom up methods are more reliable, but also much harder to do and more costly than top down methods.

What is our current tree canopy?

Our current canopy was measured in 2014 by the University of Vermont under sponsorship of Maryland National Capital Park and Planning Commission using a top down approach; the data by ward and for the city as a whole is shown below:

Ward	Percent Canopy
1	72.3
2	75.9
3	69.9
4	53.4
5	70.3
6	52.6
City Overall	66.9

One thing that is easy to see from this chart is that some wards have a much lower canopy than others, or compared to the City as a whole. Since there are so many benefits of trees, many environmental scientists believe that people have a right to equal access to the UTC.

How does this compare to other jurisdictions?

It is difficult to compare the current canopy since different jurisdictions use different measuring techniques. In 2009, the City had an existing canopy of 59% using measurement techniques different than in 2014. At this time, Takoma Park had 59% canopy and the range for cities in Maryland was from 12% to 62%.

What is the recommended UTC goal?

The recommendation by COE in consultation with the Tree Commission is for a UTC goal of 72% which represents an increase of 25% for all land that is not currently occupied by a building, street, current canopy, or water. Other goals that have been discussed range from 70% to 80%. In addition, the tree canopy should be biologically diverse so that too many closely related trees are not present at one time. Ideally the long-term should include biological diversity, a canopy comprised primarily of urban forest trees, and a canopy that is resistant to the effects of climate change.

How can this be attained?

Tree canopy can be attained by both planting new trees and maintaining and protecting existing trees. One key to attainment is an educational program. Tree canopy does not grow on public land alone and residents should be given the tools to both understand the benefits of trees and to make it easier to plant and maintain trees on private land.

How long would it take to reach the recommended goal?

Tree canopy growth, protection, and maintenance is a long-term process. Overall, it could take up to 30 years to attain the goal. Most scientists recommend measuring the canopy every 10 years to see if progress toward the goal is being made. Initially, plantings should be in areas where there is the least existing canopy using trees that would make the greatest contribution to the canopy on reaching maturity.

How would this be implemented?

Right now, there is really very little information regarding our current Urban Tree Canopy and no information on the cost-effectiveness of our existing programs. The City should consider an audit of its existing urban forest and tree-related programs to help develop a long term plan. Independent groups like Casey Trees and American Forests along with government agencies like the U.S. Forest Service and the Maryland Department of Natural Resources can help to plan and conduct a tree audit. In the meantime, the City can adopt this UTC goal and continue and even expand current tree planting and educational efforts.

Does this mean the existing tree ordinance needs to be amended?

Maybe. Changes should not be necessary to adopt the UTC goal, continue or enhance planting and education, or to conduct a performance audit. The City Manager and City Attorney should work in collaboration with both the Tree Commission and COE, along with public input, in order to determine any needed changes to the ordinance.

What will be the costs to the City?

Initially, the only additional costs would be for the audit, which would be minimal. Based on the results of the audit there may be additional costs to the City in the future for tree planting, maintenance and protection. Other costs could involve hiring an environmental educator, subsidizing the planting of trees on private property and developing educational and outreach materials for residents.

Where can I get further information?

Alliance for Community Trees (http://actrees.org/)

Arbor Day Foundation (https://www.arborday.org/)

Maryland Department of Natural resources
(http://dnr.maryland.gov/forests/Pages/programs/urban/treecanopygoals.aspx)

U.S Forest Service (http://www.fs.fed.us/managing-land/urban-forests/ucf)

Or contact the Committee on the Environment or Tree Commission

Growing Environmental Champions: Takoma Park's Trees

When it comes to tackling the negative impacts of climate change, Takoma Park's trees – especially our mature urban forest of oaks, hickories, maples, tulip poplars, pines, and other large native trees – are the unheralded champions in our midst. *Perhaps no other response to global warming offers such a wide and enduring range of benefits to our community at such a reasonable cost as does protecting and expanding our urban tree canopy.* Our urban forest also provides a host of other critical ecological and social benefits. Consider how trees contribute:

Trees Slow Climate Change by:

- Removing carbon dioxide from the air.
- Storing carbon in leaves, roots, wood, soil.
- Reducing energy use for heating & cooling by winter wind blocking and summer shade.
- Lowering greenhouse gas emissions in transportation & leisure by providing shade for walking, biking, and outdoor recreation.

Trees Protect Us from Full Impacts of Climate Change by:

- Reducing urban heat-island effect through shade and transpiring water through leaves, as heat waves intensify and proliferate.

- Relieving air pollution, as climate change exacerbates ozone and other pollutants.
- Improving stormwater management, thereby protecting clean water supplies as floods become more frequent and severe.
- Lessening soil erosion and helping soils retain water, as storms & droughts worsen.
- Protecting biodiversity by providing shelter and food for wildlife as climate change threatens many species' survival.
- Increasing local food security by producing nuts and fruits for home consumption with no carbon footprint, as more extreme weather disrupts food supplies.

Estimated Value of a Few Climate-Change Benefits From Takoma Park's Trees**		
ECOSYSTEM SERVICE	**ANNUAL RATE OF BENEFIT**	**ANNUAL VALUE**
Air Pollution Removal	28,660 pounds/year	$350,000
Carbon Sequestration	500 tons/year	$180,000
Carbon Storage	16,000 tons/year	$1,400,000
Lowered Energy Consumption	800,000 kilowatt hours/year	$640,000
ANNUAL TOTAL		$2,570,000.

More Examples of How Trees Mitigate Climate Change Hazards – Trees:

• Are associated with improved cardiovascular health, regardless of age or wealth, promising to help counter climate change's negative impact on cardiovascular health, through poorer air quality.

• Boost psychological wellbeing and emotional resilience as increasing heat stress, weather emergencies, and climate-related social disruption will be threatening higher rates of anxiety, depression, and social conflict.

• Offer a beautiful, lasting, zero-waste option: Large trees' benefits endure for many decades and sometimes centuries. When trees do die, they are fully biodegradable. There's no hazardous waste – in fact, there's no waste at all. A variety of creatures transform it all to food, fuel, shelter, and soil.
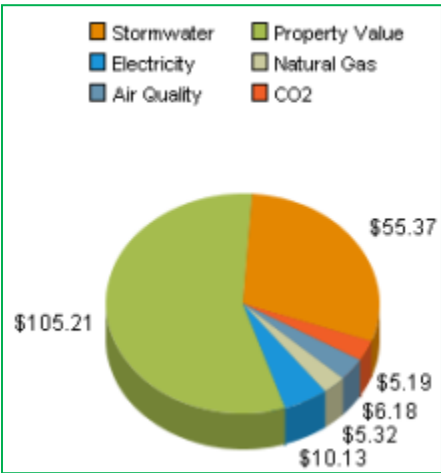
Other Social and Environmental Benefits of Trees: All of the examples above are supported by research. Studies also indicate that trees in urban neighborhoods and/or commercial districts:

• Increase property values.
• Are generally associated with lower crime rates.
• In commercial areas, encourage longer, more frequent visits & more purchases from local shops.
• Reduce light pollution, which enables sleep, protects healthy melatonin levels, and allows open windows to replace air conditioning when nighttime temperatures are moderate.
• Reduce noise pollution, as trees buffer homes and offices from sounds of traffic, construction, etc.
• Improve soils: Allowing leaves and twigs to decompose on site or composting them for mulch makes the land more fertile and improves soil structure.
• Help connect children to nature.
• Promote the cognitive, emotional, physical, and social health of children, as well as adults' health!

Maryland is already experiencing a warming trend, according to the EPA. Our state also has the fourth longest tidal coastline of all states, so is at particular risk from rising sea levels. The Washington, DC area had the sixth most intense heat island effect among 60 of the biggest U.S. cities from 2004-2013, a Climate Central study found. These threatening trends magnify the local and regional urgency of protecting and growing trees. In Takoma Park, our extensive tree canopy and farsighted Tree Ordinance give us a strong head start. Our trees are already helping to shelter us from the negative impacts of past greenhouse emissions and helping prevent additional global warming. Let's celebrate, preserve, and expand our local Climate Action Champions – Takoma Park's trees!

*** Top chart: Calculated by prorating figures for the District of Columbia to Takoma Park's smaller area and higher percent of tree canopy cover.*

Chart on Right: White Oaks are the Maryland State Tree. In just one year, a street-side, 20-inch-diameter White Oak provides an estimated $187 worth of value in these few categories alone: $55.37 in Stormwater Management, $105.21 in added Property Value, $10.13 in Electricity savings , $5.32 in Natural Gas savings, $6.18 in improved Air Quality, and $5.19 in CO2 savings. From: http://treebenefits.com/calculator/

Legend: ■ Stormwater ■ Property Value ■ Electricity ■ Natural Gas ■ Air Quality ■ CO2

$55.37
$5.19
$6.18
$5.32
$10.13
$105.21

Affordable Housing/Economic Development--Building In Sustainability: Background

OVERVIEW
CONTEXT
Council requested background on environmental aspects of affordable housing and economic development, as it considers priorities for 2017. We combined these topics as they both relate to the built environment--whether it is planned new development, revitalizations of existing development, mixed use residential and commercial development, or assistance with energy costs to make housing more affordable. The City has committed to an affordable housing initiative and to revitalization of the New Hampshire Ave corridor.

GOALS
- Reduce carbon impacts, in line with current Council priorities around energy and climate change. Reduce energy costs as one part of housing affordability. Carbon emissions can be reduced by more efficient energy use and by increased tree and shrub plantings.
- "Green building" approaches can also positively impact personal health, improve the local environment, and help make Takoma Park a more livable and affordable city.

DATA
- A significant portion of carbon emissions comes from the construction and operation of buildings.
- 50% of the City's GHG emissions are from residential buildings, another 27% from commercial buildings (Sustainable Energy Action Plan).
- Nearly half of the City's residents live in multifamily housing.
- In the DC area, household energy burden on average triples for those earning 80% or less of median income (from 2.1% of income for all to 6%, range 4-12%) (ACEEE).
- Lifetime energy savings can offset increased upfront costs, and do good for local and global climate.
- The vast majority of Takoma multifamily residents pay their own electricity; 40-50% pay heat and hot water.
- One top TFEA (City Task Force for Environmental Action) priority was establishing landlord incentives for energy-related improvements (such as including improvements that reduce carbon footprint of rental units in allowable rent increases; allowing additional energy retrofit capital improvements; and tying rent increases to anticipated renter energy savings).
- The county already requires LEED standards in all redeveloped and new buildings on county owned property.

CURRENT ACTIONS
- Takoma Park has already begun to address energy use as a part of housing affordability.
- City multifamily energy efficiency grants and incentives are helping to make rentals more efficient and livable—the City allocated $60,000 this year for improvements on just 5 properties.
- In 2015, with a $187,000 MD Energy Administration (MEA LMI) grant, 38 low to moderate income homes had comprehensive home energy audits and 20 received complete energy efficiency makeovers.
- Staff is applying for the 2017 MEA LMI grant cycle.
- A pilot multifamily tenant program showed that intensive outreach is key to engaging residents in saving energy, and that property owners must be involved.
- Flower Ave upgrade, Ethan Allen streetscape bikeways and green space, and Takoma Junction lot development project goal of environmental and green features, all show City's interest in more sustainable redevelopment

OPPORTUNITIES FOR IMPROVEMENT
- Existing residential multifamily opportunities to go beyond the City's home energy challenge, use different approaches to reduce energy use, carbon emissions, and costs to landlords and residents. An expanded focus on multifamily energy efficiency programs for landlords can benefit tenants, landlords, and yield significant GHG reductions.
- City's single family housing stock has already had a good amount of energy/environmental focus in recent years, but opportunity to go beyond current residential use policies, to reconsider all types of accessory dwelling units and allow unused living space to be used more.
- Other opportunities exist to build in energy efficiency to projects for mixed-used commercial/residential, to revitalize existing housing (some Montgomery Housing Partnership projects in the city have done this already), and build new (such as the Junction project).
- Multiple opportunities in redevelopment, especially along New Hampshire Ave corridor, at Crossroads, and Takoma Junction, to "build it in," insist on LEED-plus renovations, support green space in form of trees and shrubs, also to encourage "green" businesses.
- Opportunities citywide to both use less energy and reduce impermeable area while increasing vegetated area.
- Push county on importance of energy efficiency and LEED-plus standards, and green space/tree plantings.

POSSIBLE BARRIERS
- Lots of old housing stock, some historic designations and restrictions result in additional costs
- Commercial areas to be revitalized are among the less wealthy in the City
- City doesn't have direct zoning control, county does (though City can offer its views)
- Motivating landlords to incur expenses while maintaining rent control
- Motivating tenants requires intensive personal contact
- County level restrictions on accessory dwelling units that limit creative use of existing built space, for example on air b&b style rentals of less than 30 days and density barriers that affect tiny homes

Presented by Takoma Park Committee on the Environment, January 9, 2017

-––subcommittee Satjiwan Ikle-Khalsa, Cindy Dyballa, Lindsey Robinette

Water Quality: Background

Context
Water quality broadly in this context includes stormwater, instream water quality, and aquatic habitat. The City is required to comply with fairly stringent goals of its NPDES permit, which governs stormwater runoff that winds up in the Creek. Yet Sligo Creek is a key and visible amenity in Takoma Park, with little City control (MD DEP for stream water quality, MNPPC for stream corridor lands, USGS gauging station within the City, FOSC watch-dogging), and many other degrading influences besides stormwater. Overall Creek water quality is relatively good, with specific troubling spots and pollutants.

Data
Unlike other sustainability issues, a wealth of local water quality data from many sources is available: types of chemicals, stormwater runoff, biological health, physical habitat, specific pollutants to Sligo Creek. Understanding and focusing it is the challenge.

Goals
Maintain an excellent stormwater program, identify key sources of water degradation, and make measureable, practical steps toward improved water quality in Sligo Creek and its tributaries.

CURRENT ACTIONS

- City's innovative stormwater control measures for public spaces for NPDES permit compliance, and to reduce stormwater by about 20% from publicly controlled impervious areas (such as streets)
- Safe grow restrictions on lawn chemicals that might otherwise wind up in Sligo Creek
- Street sweeping (reduces particular nutrient and perhaps toxics loads to Creek)
- Pet waste clean-up requirements
- Plastic bag ban (reduces litter to Sligo Creek)
- City Watershed Implementation Plan (2012) stressing stormwater management
- FOSC monitoring of Maple Ave stormwater drains, that builds on previous City efforts, to identify sources of pollutants

OPPORTUNITIES FOR IMPROVEMENT

- First step: gather information from many sources to identify and understand the problems and to isolate one or two for City action
- Support stormwater improvements on private property that complement City's excellent work on public stormwater management; TFEA recommended private sector incentives to reduce runoff, starting with largest impervious areas (largely institutional owners)
- Partner with FOSC on Sligo Creek to identify runoff issues and possible solutions, or specifically to identify source(s) of Maple Ave pollutants
- Ensure other entities in City are meeting their regulatory requirements
- Explore benefits and costs of daylighting (opening up) one or more underground tributary stretches in the City
- Expand education on non lawn-care pesticides

POSSIBLE BARRIERS

- City is only one actor, with limited legal authority to require actions
- Takoma Park is downstream on Sligo Creek in a more populated area of Chesapeake Bay Watershed
- Contaminants work is expensive and technically complex

Presented by Takoma Park Committee on the Environment, January 9, 2017

-–– *subcommittee Paul Chrotowski, Cindy Dyballa, Marty Ittner, Lauren Marshall*

Renewable Energy: Background

Overview

Council requested background on ways it can further the use of renewable energy, as it considers priorities for 2017. In its ongoing effort to reduce the impacts of climate change in Takoma Park, the City is interested in doing more to support the expansion of renewable energy for residents and businesses. Certain barriers to renewables exist in our community—including a healthy tree canopy that blocks solar radiation, aging roofs that cannot support solar without a replacement, high cost of entry for installing renewable systems, and lack of education and awareness—some of which the City can help overcome with financial incentives and education.

GOALS

• Move closer to carbon neutrality by further reducing per capita carbon emissions for city residents and businesses. Increase participation in lower participating circles of multi-family and commercial properties.

• Provide cost savings and incentives to city residents and businesses for switching to renewable energy, especially community solar

• Promote education of environmental initiatives to different interested parties in the City. One strategy: working cooperatively with school children and classes to design projects, spread the word, and provide real-life educational opportunities for classes.

DATA

• Community solar has great potential in the City because of the heightened interest in solar but the presence of large tree canopy shades a high percentage of residential roofs.

• Parking lots have great potential for solar panels due to high solar exposure and reduced aesthetic issues but are currently under-utilized due to increased costs and safety concerns over roof top solar.

Current Actions

• In 2014-2015 Takoma Park increased residential solar installations by 35% over the previous 5 years combined through the Takoma Park Silver Spring Solar Co-op organized by staff and Maryland Sun.

• Residents have been able to participate in three subsequent solar co-ops run by Maryland Sun.

• Solar already on some City-owned buildings.

• County has already evaluated other locations for solar in TKPK including firehouse and recreation center. Unfortunately not feasible in either location.

• Staff has been supporting Neighborhood Sun, a new company promoting Community Solar projects. A Community Solar project in the city is unlikely in 2017, but efforts to secure interest from a building owner with suitable rooftop space is ongoing. Neighborhood Sun is not including parking canopies in their efforts due to concerns over return on investment for the investors given the community solar business models.

• City buys 100% wind power for its City operations.

• The City has supported biofuels in form of corn stove program for some time.

Opportunities for Improvement

Solar and Other Renewables

❖ Enable community solar opportunities for residents with no home rooftop solar potential (to be organized by staff and Neighborhood Sun).

- ➢ Create tax or other incentives to make community solar more viable for owners of potential host sites including commercial roofs and parking lot canopy.
        - ➢ Offer tax or other incentives to homeowners or businesses that need to make structural improvements to their buildings before installing solar panels (i.e., roof replacement).
        - ➢ Subsidies for economically disadvantaged to pursue community solar.
    - ❖ Opportunity to subsidize the purchase or help low income homeowners with poor credit qualify for home solar financing.
    - ❖ Opportunity to purchase renewable energy (credits) in aggregate for the entire city's energy use, for example bulk buy of wind power.
    - ❖ Evaluation of corn stove program.
    - ❖ Investigate group purchase discount (using Solar Co-op model).

Education

- ❖ Provide education on renewable energy opportunities via bus shelter/bus advertising, improved TKPK sustainability website, and running stories in the TKPK newsletter about residents and businesses that already use renewables.
- ❖ Offer open houses and neighborhood tours to show residents and businesses renewable energy systems in action.
- ❖ Run environmental poster contests with local school classes (e.g., science, art, computer science, world studies, Spanish, environmental clubs) to create said posters for TKPK local environmental efforts.

Possible Barriers and Opportunities

Overall, barriers to expanding renewable energy installations and use in Takoma Park relate to available funding opportunities, limited staff time, and lack of education and awareness.

- One barrier the City faces in the realm of solar energy is our tree canopy—community solar is one potential avenue to address that. City staff is already supporting efforts of local organizations like Neighborhood Sun or Maryland Sun. Staff must provide educational materials, assist with open houses, and respond to questions.
- Another barrier to renewable energy installation is high cost and access inequality—to overcome this barrier, the City can assist with a tax credit or other incentive to reduce the high cost of installation, home modifications that may be needed to make renewable energy system installation, or to make community solar in the low-moderate income communities more affordable. One major unknown here is the amount of funding needed to make impactful change—dependent on Council goal (i.e., number of new homes with solar, number of residents involved in a community solar project) and an amount per home/business that the City could incentivize.
- There is currently a lack of easy-to-understand renewable energy education available in the city. Staff and library/education staff could improve existing resources or provide more opportunities to explore renewable energy information. The proposed new City sustainability website could include a renewable energy education section; educators could run a poster contest or other renewable energy focused topic in lesson plans; staff could offer in-person education events.
- Available staff time is another barrier—the sustainability staff are already focused on a new residential challenge, and are still focused on the Georgetown Energy Prize, so dedicating time to renewable energy could be a challenge. Possible opportunities could be to offer a renewable energy focused internship, or ask staff to focus their next campaign on renewables.

Presented by Takoma Park Committee on the Environment, January 2017
---subcommittee Jamey Gerlaugh, Lindsey Robinette, Denis Borum