The Somerville Green Standard

a supplement to the zoning code

December 2017

Introduction

This document supplements the proposed citywide zoning code. It is intended to implement the goals of SomerVision and Sustainaville - to increase the health and wellbeing of our residents and that of our environment - by improving air quality, water quality, energy efficiency, stormwater management, and ecological health. While the proposed zoning addresses some of the concerns we will face as human-induced climate change effects increase, it does not maximize its potential to adequately address the City's needs. It is our responsibility to current Somervillians and future generations to set high expectations and create regulations, structural checks, and incremental steps to ensure that SomerVision and Sustainaville's goals are actually met. Somerville is exceptional, and our environmental standards should be, as well.

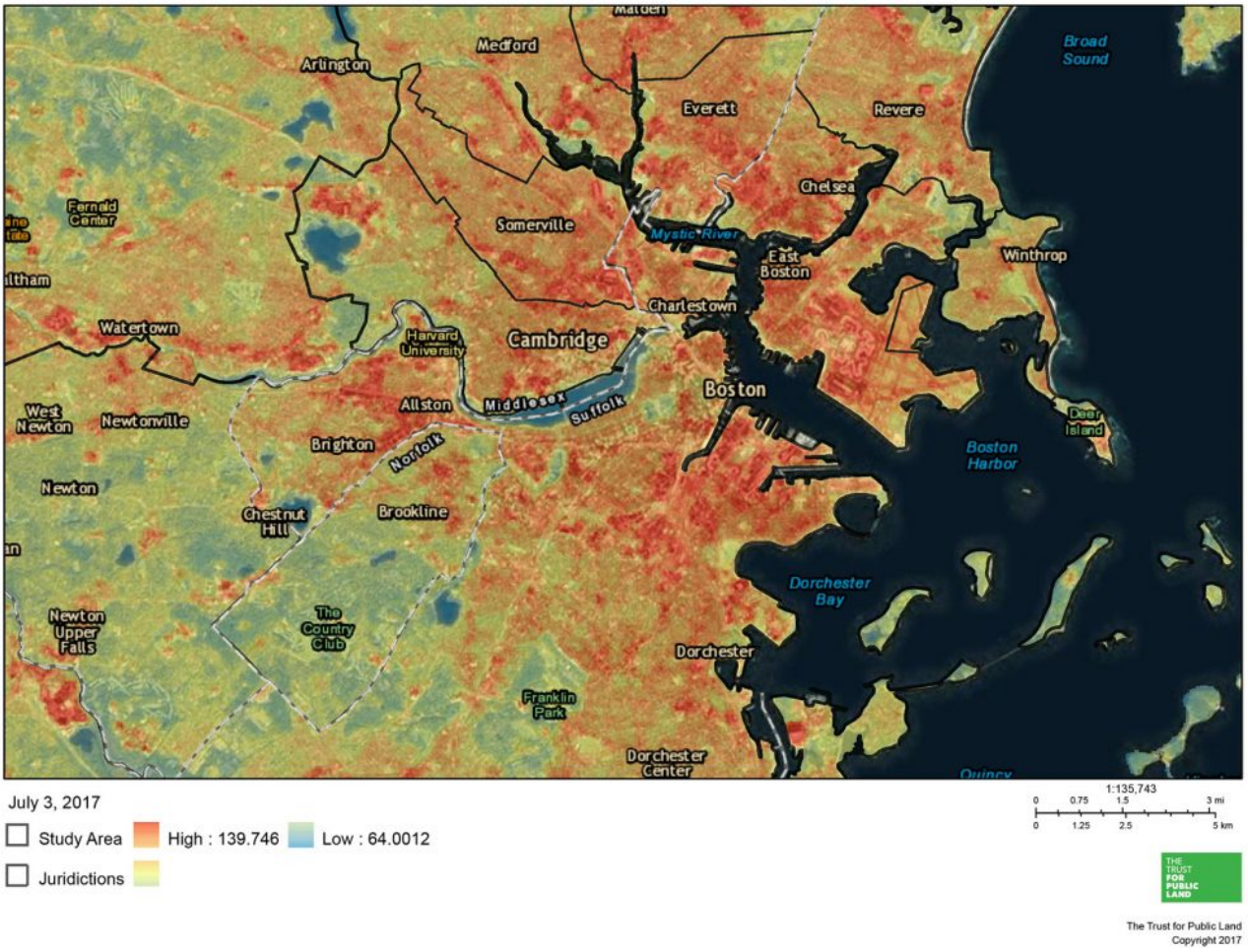
Mayor Curtatone acknowledges this when he says, *"To do our part to reduce our city's contribution to climate change, Somerville has set a goal to become carbon neutral by 2050."* How can we achieve the mayor's admirable goal and do our part if we do not set aggressive regulations in the blueprint for our city's future growth: zoning? We need to design our buildings for maximum energy efficiency, minimize the impact of our solid waste and stormwater, and reduce our carbon footprint through healthy green space.

SomerVision's intent regarding open space is to "*Create, maintain, and enhance areas for recreational or resource conservation uses that address community needs for psychological and physical well-being, relief from the urban environment, and nature conservation."* Somerville's residents need improved access to high-quality, abundant green space. Only about half live ¼ mile or less walk from open spaces comprised primarily of green space (e.g. Passive Parks, Community Gardens, Athletic Fields). Recent articles have focused on the importance of green space and nature in the mitigation of climate change impacts and the problems the lack of these can cause to human health and wellbeing.

A 2016 World Health Organization report on urban green space found that these spaces improve relaxation and restoration, social capital, and the functioning of the immune system, enhance physical activity, improve fitness, reduce obesity, buffer noise, reduce exposure to air pollution and reduce the urban heat island effect, enhance pro-environmental behavior, optimize exposure to sunlight and improve sleep, improve mental health and cognitive function, reduce cardiovascular morbidity and type-2 diabetes, improve pregnancy outcomes and reduce mortality rates. It concludes that, "*A city of well–connected, attractive green spaces that offer safe opportunities for urban residents for active mobility and sports as well as for stress recovery, recreation and social contact, is likely to be more resilient to extreme environmental events, such as heat waves (due to the mitigation of urban heat island effect) and extreme rainfall (due to reduced surface run–off). Such a city is also likely to have healthier citizens, reducing demands on health services and contributing to a stronger economy*."

An [October 2017 article in The Guardian] stated that *"'regreening of the planet' would be equivalent to halting all burning of oil worldwide. 'Better stewardship of the land could have a bigger role in fighting climate change than previously thought,' the international team of scientists said of findings published in the US journal Proceedings of the National Academy of Sciences. 'If we are serious about climate change, then we are going to have to get serious about investing in nature,' said Mark Tercek, chief executive officer of The Nature Conservancy, which led the study."*

In July 2017, [WBUR reported on urban heat islands] in Chelsea, MA, though could have been speaking of Somerville (the map below is from the article).



"As coastlines recede with global warming, so-called heat islands are growing. These are dense urban areas where cement or asphalt cover most of the ground, where multi-story buildings — often brick — bake in the sun, and where there are few trees . . . Daily temperatures in these spots can be 20 to 50 degrees hotter than in leafy suburbs. For residents of these islands, health risks rise with the heat . . . That's the prediction of doctors who study climate change: more dehydration and kidney failure, more difficulty with emphysema, asthma and other lung conditions, more heart problems and heat stroke . . . All the kids who live within heat islands may be at risk for more stress at home. In the emerging world of climate science, research

shows heat interferes with sleep, increases aggression, and contributes to some mental health problems."

An October 2014 study by the NIH says, *"There is growing evidence to suggest that exposure to natural environments can be associated with mental health benefits. Proximity to greenspace has been associated with lower levels of stress (Thompson et al., 2012) and reduced symptomology for depression and anxiety (Beyer et al., 2014), while interacting with nature can improve cognition for children with attention deficits (Taylor and Kuo, 2009) and individuals with depression (Berman et al., 2012). A recent epidemiological study has shown that people who move to greener urban areas benefit from sustained improvements in their mental health (Alcock et al., 2014)."*

Changing the way we landscape, what we plant, and how we maintain those plants is another important step in reducing our negative impact on the environment. A December 2017 New York Times article looked at how the sequestration ability of healthy soil is emerging as the leading way to draw down carbon from the atmosphere. *"Rattan Lal, the director of the Carbon Management and Sequestration Center at Ohio State, estimates that soil has the potential to sequester carbon at a rate of between 0.9 and 2.6 gigatons per year . . . 'Putting the carbon back in soil is not only mitigating climate change, but also improving human health, productivity, food security, nutrition security, water quality, air quality — everything.'"*

The Somerville Green Standard will guide Somerville to maximize its zoning to achieve the following:

- reconnect with nature
- reduce stress
- increase well-being
- better prepare to survive climate change
- meet our goal of being carbon neutral by 2050
- clean our water and air
- reduce flooding and the amount of stormwater going into the sewer system
- increase energy efficiency
- save money
- produce less waste going to the landfill or incinerator
- bring back pollinators, healthy ecosystems, and dark skies

Scientists are using the best information available to determine the future impacts of climate change, but as technologies advance, innovations occur, building standards change, storms worsen, water levels increase, and temperatures rise, the Somerville Green Standard should be revisited and updated.

This is a living document and, as such, it requires review and revision periodically so that it evolves with the City's needs in response to the knowns and unknowns of climate change. Coordination between city departments and services is vital to the success of the Somerville

Green Standard (SGS). Given the lack of current communication and the breadth of city projects, policies, and planning that must prioritize sustainability and climate resiliency, it is recommended that an SGS Review Committee be formed and conduct a review every three years. Suggested committee members include:

- Commission on Energy Use and Climate Change (CEUCC) member
- a senior planner
- at least one alderman who sits on OSEE committee
- Director of Sustainability and Environment
- Urban Forestry Committee member
- Conservation Committee member
- arborist or tree warden
- Head of Transportation and Infrastructure
- an environmental justice representative

Additionally, the SGS certification that a property receives after showing compliance needs to be rechecked, and recertified, on a regular basis. So much of the standards in this document require proper maintenance to continue to perform as intended. We recommend annual checks.

We would like to see a program where developers share what works and what doesn't with the city and other builders concerning new standards; a check-in where the building owner submits an update on required systems and how they are working at 1, 5, and 10 years would increase our understanding of new technologies and their effectiveness.

In any area of the zoning where the Somerville Green Standard conflicts with the proposed zoning as written (e.g. tree planting standards), the SGS should be used.

Incentives:
In addition to the regulations of zoning, it is important to encourage developers and residents to go above and beyond what is required. Whether State law prohibits it, or because of form-based zoning, there are some categories of the SGS that would best be encouraged through incentives but there is no current way to do this. There is precedent: a project in Miami, Miami21, used form-based zoning with FAR incentivization. For some areas, removing fees or offering a tax break might be the answer. This will require further research but should be a priority.

Among the areas that could benefit from incentives:

- encourage developers to meet stricter environmental standards to meet the goals of the SGS
- build net zero structures
- include air filtration for all buildings within 300 feet of highways
- depave public and private property through waived permitting fees, tax breaks, or stormwater fee reduction

- Composting - 40% of our waste is compostable
- Pervious pavement that connects to the groundwater instead of the stormwater/sewer system is much more effective for managing stormwater
- Can we incentivize residents to install solar, retain stormwater, plant trees, depave, and compost? Somerville's high residential percentage means residents can contribute significantly to our continued environmental health and climate change preparedness
- Highrise buildings should encourage nesting structures. Peregrine falcons would keep pigeons away
- Incentivize parking lots to have above 5% bioswale coverage
- Incentive for mechanicals somewhere other than roof of buildings to increase space for green roof, solar panels, water catchment, and outdoor use (patios, gardens, etc.)
- Incentive to cover mechanicals with solar and/or vegetation
- Encourage reduction of impervious surfaces by taxing them
- Encourage multiple, adjacent buildings to form a cooperative system to share the different elements (one roof all solar, one all green, another collects water)

Ecology

In addition to being the most densely populated city in Massachusetts, Somerville is ranked one of the lowest in green space acreage. Increasing the amount and improving the quality of our green space is essential to:

- improve the health and wellbeing of the City's many residents and our environment;
- increase the biodiversity of our plant and pollinator species;
- address the arising challenges of climate change and ameliorate any resulting consequences as much as possible.

To achieve these goals, we must:

- landscape and perform maintenance sustainably to eliminate the use of pesticides and fertilizers and increase soil health;
- increase the health of our trees and plants through companion planting, proper installation, and maintenance;
- increase our green space through land acquisition and preservation, with particular attention paid to the connectivity of natural spaces to allow for pollinator corridors;
- reduce synthetic surfaces that pollute, increase the urban heat island effect, remove green space, and do not support beneficial pollinators;
- bring back an environment that supports pollinators, which support all life on earth, by introducing a Native Plant Ordinance and a Dark Sky Ordinance.

Definitions

Green space - *Land of any shape or size, consistent with the definition, that serves ecological, environmental, aesthetic, recreational, or similar purposes. Green Space shall be open and unobstructed to the sky, allow for direct groundwater infiltration, and shall consist of friable, permeable materials (including but not limited to loam, sand, naturally occurring soil, bedrock, and incidental pipes and other underground utilities) having a minimum depth of three (3) feet and planted with living trees, grass, ground cover, bushes, shrubs and/or similar living vegetation, as well as water or other natural features of the site. In any place possible, living mulch, such as planted ground cover, should be used. Such areas may not include any hard surface areas (e.g., parking lots). Any walkways, terraces, or pervious ground covers such as gravel, stone, non-living mulch, wood chips, pervious pavers, or permeable asphalt, will not count towards the green space total amount. All materials, except those being used in underground utilities or for structural support, must be natural. No petroleum-based products can be used.* (SCA and G&OS)

Biodiversity - *the variability among living organisms from all sources, including terrestrial, marine, and other aquatic ecosystems and the ecological complexes of which they are part; this includes diversity within species, between species, and of ecosystems.* (greenfacts.org)

Depaving - *removing asphalt down to bare soil, replacing with clean soil, and covering the area with grass, other plants, or pervious, porous, or permeable pavers.* This allows stormwater to infiltrate into the groundwater and not burden the sewer system. It also cools the air and provides the benefits of additional green space.

Native plant - *A plant that is a part of the balance of nature that has developed over hundreds or thousands of years in a particular region or ecosystem.* Note: The word *native* should always be used with a geographic qualifier (e.g. “native to New England”). Only plants found in this country before European settlement are considered to be native to the United States. (https://www.nrcs.usda.gov/wps/portal/nrcs/detail/ct/technical/ecoscience/invasive/?cid=nrcs142p2_011124)

Neonicotinoids - *any of a class of broad-spectrum insecticides having a chemical structure similar to that of nicotine and acting on the central nervous system of insects by selectively binding to nicotinic acetylcholine receptors* (merriam-webster.com).

Pollinator - *an animal that moves pollen from the male anther of a flower to the female stigma of a flower.* Pollinators, such as most bees and some birds, bats, and other insects, play a crucial role in flowering plant reproduction and in the production of most fruits and vegetables. Without the assistance of pollinators, most plants cannot produce fruits and seeds. The fruits and seeds of flowering plants are an important food source for people and wildlife. Some of the seeds that are not eaten will eventually produce new plants, helping to maintain the plant population. (wikipedia and U.S. Fish and Wildlife).

Porous vs. permeable vs. pervious pavers - porous *allows water to seep through openings in the paver;* permeable *allows water to go around it into the surrounding soil;* pervious *allows water to go through the surface to the soil below.* However, in typical construction of parking areas with these pavers, there are only a few feet of soil and then a layer of asphalt, so the water must be diverted to the stormwater system to alleviate flooding. These pavers help slow the runoff to the stormwater system but unless the soil below is healthy, not blocked by underground barriers, and connected to groundwater, they are not eliminating the problem.

Poured in place rubber playground surfacing - *playground surface made from recycled tires, virgin rubber, and urethane-based binders.* It can be up to 50 degrees hotter than the ambient temperature.

Rubber mulch - *Tires that are broken up into pieces and used as mulch in landscaping.* Bucknell University has found that rubber leachate is capable of killing algae, zooplankton, snails and fish. Some studies have shown that high levels of zinc found in rubber can lead to zinc toxicity in plants. It is flammable. (www.totallandscapecare.com/landscaping/rubber-mulch)

Sustainable - *a method of harvesting or using a resource so that the resource is not depleted or permanently damaged* (merriam-webster.com).

Synthetic/Artificial turf - *synthetic fibers made to look like natural grass.* It is most often used in arenas for sports that were originally or are normally played on grass. (wikipedia)

Systemic pesticides - *pesticides that are taken up by the plant and transported to all the tissues (leaves, flowers, roots and stems, as well as pollen and nectar), unlike other pesticides which remain on the surface of treated foliage.*

Ecological Design Principles

When planning, planting, and maintaining Somerville's flora, the following principles should be considered.

1) Sustainability—

a. Water-wise methods—capture as much water in the ground as possible. Make plantings that require as little extra water as possible.

b. Use local materials

c. Use as little amendments as possible—using plants adapted to the soils requires less inputs to the soil that would have to be brought by truck and human power

d. Use as little mulch as possible—mulch also needs to be brought by truck and doesn't do anything for the soil ultimately. Plants should be used in place of mulch wherever possible (where foot traffic will not kill them). This includes tree wells—mulch encourages dog, and human, traffic which is hard on trees, especially new trees. Planting tree wells with appropriate species would benefit the tree in many ways.

e. Use smaller, younger plants at time of planting. Growing and transporting large plants is taxing on both the environment and the budget. At the same time, younger plants are healthier and far more likely to thrive after being transplanted.

f. Create plantings that require little or no herbicides, pesticides, or fertilizers

g. Use the right plant for the right place—using plants that reproduce successfully, either by seed or root, should be used to create a more durable, healthy design that resists weeds and is resilient to stress and damage from disturbance.

h. Design based on plant communities—plants suffer in isolation and thrive in communities. Designing with a mix of plants that have interlocking functions makes for a healthier more resilient planting. For example, trees can be underplanted with shrubs, herbaceous plants like flowers or grasses, or ground covers which help with water infiltration and retention, and may provide other benefits, such as, fixing nitrogen and in effect fertilizing the trees.

i. Trees should be sited with growth habit in mind, and in consideration of long term maintenance—for instance, shorter growing trees should be selected instead of large growing species for planting under power lines or other structures that will require pruning and maintenance that ultimately compromise the health of the tree.

2) Ecology—

The healthiest and most beautiful plantings are good for both humans and wildlife. Using native, wild plants is the best and only way to achieve resilient plantings that benefit both people and the local ecology. Using maintenance techniques that benefit ecology, including leaving leaves on the ground where they fall, cutting back perennial flowers only in the early Spring, and using plants to cover the ground instead of processed bark mulch, should be a part of the design process. This will generally reduce the cost of labor and upkeep.

3) Reduce, reuse, recycle

Designers should strive to reduce the amount of materials brought into a new design wherever possible. Materials that can be, should be kept on site as much as possible, such as trees or branches that are cut down.

4) Low maintenance—

Plants native to this region will require little maintenance, though still need some care. Reducing maintenance saves time and money. The maintenance techniques mentioned above not only require less time, they also benefit the plants and the wildlife. Ecologically speaking there is such a thing as beneficial neglect because all that stuff on the ground and leaf litter are where so many moths and butterfly babies spend the winter.

5) Aesthetics—

Finding beauty in the flora that are native to this region and in the look of using living ground cover instead of bark mulch, leaving leaf litter, and planting no-mow grasses may take some time, but the benefits of these techniques that replicate what nature does on its own, at its most healthy, will be worth it.

Lawns, fields, roadways, and planting beds

Pesticides

Ban neonicotinoids and all plants treated with them. Neonicotinoids stay in the seed of the plant and will continue to kill insects that eat from them as long as the plant lives and produces seed.

Rationale: Neonicotinoids have been proven to pose a substantial risk to native bees (Rundlof et al 2015, Stanley et al 2015, Lundin et al 2015) and other beneficial insects (Larson et al 2014), leading both the EU and Canada to restrict their usage

Rundlöf, Maj, et al. "Seed coating with a neonicotinoid insecticide negatively affects wild bees." *Nature* 521.7550 (2015): 77-80.

Stanley, Dara A., et al. "Neonicotinoid pesticide exposure impairs crop pollination services provided by bumblebees." *Nature* 528.7583 (2015): 548-550.

Lundin, Ola, et al. "Neonicotinoid insecticides and their impacts on bees: a systematic review of research approaches and identification of knowledge gaps." *PLoS One* 10.8 (2015): e0136928.

Larson, Jonathan L., Carl T. Redmond, and Daniel A. Potter. "Impacts of a neonicotinoid, neonicotinoid–pyrethroid premix, and anthranilic diamide insecticide on four species of turf-inhabiting beneficial insects." *Ecotoxicology* 23.2 (2014): 252-259.

Ban systemic pesticides*:* They do not just kill the targeted pest. Remove the infected trees instead of killing all insects that come in contact with tree. If any pesticides are used, they must be specifically targeted to one particular insect and must break down.

Grassy planted areas
Grass maintenance uses considerable time, energy, and money. Therefore, following the lead of MassDOT on I-90, no-mow grasses, low profile shrubs, and perennial flowers are required for use on our medians, along roads, on hillsides, between sidewalks and streets, and along the sides of buildings. Reducing mowing to once a year saves time and money. See list below for approved plantings. Regular maintenance for trash cleaning would remain the same. With the exception of spaces intended for gatherings, events, etc., (City Hall Plaza, athletic fields, for example), no-mow grass should be used.

Maintenance of no mow areas
Ideally, mow in late winter to minimize harm to pollinators. It should be mowed no shorter than 4 inches. If late winter mowing is determined to be impossible, fall mowing is allowed but must be no shorter than 6 inches. Never rake or leaf blow. Because many no mow grasses are late to turn green, planting spring flowers in with the grass can keep the areas looking nice. Accompanying signage should be at each location for at least the first two years explaining what is happening to educate the public and reduce complaints.

Establishment of "Leaf Litter Sanctuaries" for urban insects
Set aside areas of urban forests (such as Powderhouse Park) and sections of park/playground edges as leaf litter sanctuaries, where natural litter is allowed to accumulate rather than be cleaned up. Signage may be needed to explain the value of such areas. Areas could be selected specifically to improve efficiency of mowing/clean-up needs.

Rationale: Urban insect communities are often low in species richness compared to rural environments. This is due to many factors, however a major issue is the lack of natural leaf litter material. Leaf litter (leaves, fallen twigs and branches and other decomposing plant material) provides vital habitat for a vast array of beneficial arthropods, including beetles (Martinson and Raupp 2013), ants (Mertl, unpublished data), and pollinator larva (McIntyre 2000). Without such cover, many species cannot nest or overwinter in urban areas (Pickett et al 2001, Raupp et al 2010).

Martinson, Holly M., and Michael J. Raupp. "A meta−analysis of the effects of urbanization on ground beetle communities." *Ecosphere* 4.5 (2013): 1-24.

McIntyre, Nancy E. "Ecology of urban arthropods: a review and a call to action." *Annals of the Entomological Society of America* 93.4 (2000): 825-835.

Pickett, Steward TA, et al. "Urban ecological systems: linking terrestrial ecological, physical, and socioeconomic components of metropolitan areas." *Annual review of ecology and systematics* 32.1 (2001): 127-157.

Raupp, Michael J., Paula M. Shrewsbury, and Daniel A. Herms. "Ecology of herbivorous arthropods in urban landscapes." *Annual review of entomology* 55 (2010): 19-38.

Synthetic surfaces

Artificial/synthetic turf, crumb rubber, poured in place rubber, and rubber mulch contribute to the heat island effect because they are hotter than natural surfaces, contribute to greenhouse gas emissions from production through installation, migrate into waterways and soil, and reduce green space and all of the benefits associated with it. Therefore, these products should be banned on any publicly-owned or maintained space, as well as on private properties.

Tree health, welfare, and protection

Trees are the ideal community member. They:

- emit oxygen
- sequester carbon
- clean the air
- provide shade and cool the ambient air
- stabilize soil
- act as a buffer to noise
- absorb stormwater
- provide homes for wildlife, including pollinators

Studies have shown that being in the vicinity of a tree lowers blood pressure, heart rate, and stress levels, while trees near schools have even been shown to improve test scores. Therefore, we must properly maintain and increase our tree canopy to improve the health and wellbeing of our residents and the natural environment, provide corridors for pollinators, and meet the Mayor's Monarch Pledge to restore habitat.

Rationale: Trees in the U.S. have been estimated to remove 17.4 million tons of air pollution per year, and save $6.8 billion in health care costs related to respiratory issues, predominantly in urban areas (Nowak et al 2014). Controlling for socioeconomic variation, urban tree canopies have been associated with better health (Ulmer et al 2016) and higher reading scores in schools (Hodson and Sander 2017).

Nowak, David J., et al. "Tree and forest effects on air quality and human health in the United States." *Environmental Pollution* 193 (2014): 119-129.

Ulmer, Jared M., et al. "Multiple health benefits of urban tree canopy: The mounting evidence for a green prescription." *Health & place* 42 (2016): 54-62.

Hodson, Cody B., and Heather A. Sander. "Green urban landscapes and school-level academic performance." *Landscape and Urban Planning* 160 (2017): 16-27.

Tree planting and maintenance:
Eric Fleischer is a field and tree health specialist. He works on Harvard Yard and practices organic maintenance there. He is a big proponent of compost and healthy soil to improve tree heath. His contact info: http://www.f2environmentaldesign.com/projects.html

Article 10.4 of the proposed zoning code refers to Landscaping. Any part referring to tree or woody plant planting or maintenance standards, **REPLACE** with guidelines from urbantree.org

ADD: Short fences around tree wells with mandatory groundcover planting around trees reminds people that tree wells are not for trash, dog toileting, or walking in. Signage is encouraged.

ADD: No crumb rubber around trees.

Soil depth and carbon sequestration: Trees and other plants planted in healthy soil, deep enough for roots to grow properly, will sequester carbon. Sufficient depth and width must be provided. See urbantree.org for guidelines.

Companion Planting:
All plants thrive in communities and suffer in isolation. Both soil and root health is directly dependent on the plant life that covers and fills the top layers of soil. Especially for a newly planted street tree, planting the entire tree box, instead of just using mulch, is likely to significantly impact the health and longevity of that tree, decrease the need for watering and eliminate the need for fertilization.

Most longer-lived tree species, like Oak or Maple, actually grow stronger branches and are overall more healthy when, if in their early years, they grow in the shade of other trees. In city conditions, this is difficult to reproduce, but it opens the possibility to planting slower growing, longer lived trees as smaller, younger plants alongside a faster growing, shorter lived species in the same tree well. By the time the shorter lived species is ending its life, the longer lived tree will be ready to take over and thrive. The intermingling of the roots of those trees will benefit both, and the dead roots of the shorter lived tree that are left in the ground once that tree is taken down will create a more natural and healthier soil that will benefit the older growing tree far into the future. Equally significant is the ability to plant smaller, younger trees for the longer lived species, and using the shorter lived species to protect them for the first few years. Younger plants are far better at adapting to the new conditions of a transplant—their roots are ready to grow, whereas an older tree that is transplanted has just had its roots removed and will never fully recover from that trauma. Even if that tree survives transplanting, its longevity is

significantly compromised—it will never grow to be the 100-year old tree it is genetically capable of becoming. Ideally, long-lived trees should be planted with no more that 1” caliper (stem diameter). Planting young trees also saves costs in both production and transportation, as well as in maintenance, as they will require less from us once they are planted (large trees will always require supplemental watering for the first 2-3 yrs.).

Covering the ground around the tree with native grasses, sedges, ground covers, and wildflowers instead of bark mulch would also greatly benefit the young tree newly planted and create additional habitat for pollinators and other native insects. Plants direct rain water with their leaves and roots into the soil and then hold it there. Mulch, especially when walked on, acts more like an umbrella, shedding water rather than absorbing. Plus, by design, mulch decreases the life in the soil—it keeps weeds down, for a while, but also decreases the microbial life that would be living among the roots of those plants. It is that microbial life that is so important to the health of the tree planted there, and so mulching with bark mulch instead of plants is counterproductive.

Suggested plants—

Long lived, large street trees—

Black cherry	Prunus serotina
Oak sp.	Quercus alba
	Quercus palustris
	Q. coccinea
Maples	Acer rubrum
	A. saccharum
Hickory	Carya ovata
Sweet-gum	Liquidambar styraciflua
Black-gum	Nyssa sylvatica
Birches	Betula alleghaniensis (yellow birch)
	B. nigra (river birch)
	B. lenta (black birch)
Sourwood	Oxydendrum arboreum
Sassafras	Sassafras albidum
Tulipa tree	Liriodendron tulipifera

Short lived, smaller and companion trees—

Grey birch	Beltula populifolia
Pin cherry	Prunus pensylvanica
Choke cherry	Prunus virginiana
Redbud	Cercis canadensis
Dogwood	Benthamidia florida
Silverbell	Halesia carolina
Serviceberry	Amelanchier canadensis

***Understory, companion, living mulch*—**

Grasses and sedges—

Little bluestem	Schizachyrium scoparium
Purple lovegrass	Eragrostis spectabilis
Autumn bent grass	Agrostis perennans
Wavy hair grass	Deschampsia flexuosa
Pennsylvania sedge	Carex pensylvanica
Narrow-leaved sedge	Carex amphibola
Plantain-leaved sedge	Carex plantaginea

***Ground covers*—**

Canada anemone	Anemone canadensis
Wild strawberry	Fragaria virginiana
Woodland phlox	Phlox stolonifera
Bleeding heart	Dicentra eximia
Hay-scented fern	Dennstaedtia punctilobula
Sweet-fern	Comptonia peregrina (nitrogen fixer)

***Wild flowers*—**

Milkweeds	Asclepias syriaca (common milkweed)
	A. tuberosa (butterfly weed)
	A. verticilata (whorled milkweed)
Asters	Symphyotrichum cordifolium
	S. laeve
	S. ericoides
	S. patens
	Eurybia divaricata
Goldenrods	Solidago caesia
	S. nemoralis
	S. puberula
	S. bicolor
	S. sempervirens
	S. odora
Wild indigo	Baptisia tinctoria (nitrogen fixer)
Wild lupine	Lupinus perennis (nitrogen fixer)
Columbine	Aquilegia canadensis
New Jersey tea	Ceanothus americanus (nitrogen fixer)
Boneset	Eupatorium hyssopifolium
Mountain mint	Pycnanthemum tenuifolium
Rose	Rosa virginiana
Alexanders	Zizia aptera
Beard tongue	Penstemon hirsutus

Wild onion	Allium canadense
	A. cernuum
Bell flower	Campanula rotundifolia
Bush clover	Lespedeza

Protection: 10.4 part 8 of proposed Somerville Zoning, **REMOVE** part b. iv. b) regarding a payment in lieu of replanting. 10.4 part 8 c. ii **REPLACE IN ENTIRETY** with “refer to the standards in http://urbantree.org/details_protection.shtml”

Removal: Any tree slated for removal, for any reason, including on private property, must be brought before the Somerville Urban Forestry Committee first.

When a tree is removed, what happens? How can we reuse wood so that it is removed our municipal waste stream? Could residents claim/access it? Can woodchips be used in playgrounds or put on the ground around wooded areas, or can the wood be used as benches in parks or as flower planters?

Street trees:
Street trees need protection. This can be achieved with companion planting (see Companion Planting section above), temporary cages, and signage. All of these will show that this tree is important and not to be damaged or used as a bathroom by dogs. Eliminate non-living mulch, as this looks like a place for dogs to urinate. Plant long-lived large trees, plus a small, fast growing, shorter-lived tree next to it. Use urbantree.org for planting guidelines.

Increase well size with bump-outs (also acts as traffic calming). Look at street parking. Anywhere there is a space with a remainder where a car will not fit, use the extra for tree wells, where they fit, or for rain gardens/bioswales. Street tree wells do not have to have trees - they can also be planted with shrubs, flowers, or a pollinator-friendly garden. See the following list of pollinator powerhouse plant from the New England Wildflower Society.

Pollinator Powerhouse Plants

NEW ENGLAND WILD FLOWER SOCIETY

This list comprises those plants that are especially valueable as host plants for butterflies and moths. All woody species support greater than 75 species of lepedoptera and all herbaceous species support greater than 15 species

Abies balsamea	balsam fir	*Pinus strobus*	white pine
Acer pensylvanicum	striped maple	*Polygonatum biflorum*	King Solomon's seal
Acer rubrum	red maple	*Polygonatum pubescens*	downy Solomons seal
Acer saccharinum	silver maple	*Populus tremuloides*	quaking aspen
Acer saccharum	sugar maple	*Prunus americana*	American plum
Acer spicatum	mountain maple	*Prunus maritima*	beach plum
Allium cernuum	nodding onion	*Prunus pumila*	sand cherry
Alnus incana ssp. rugosa	speckled alder	*Prunus serotina*	black cherry
Amelanchier canadensis	Canada serviceberry	*Prunus virginiana*	chokecherry
Amelanchier laevis	Allegheny serviceberry	*Quercus alba*	white oak
Amelanchier spicata	running serviceberry	*Quercus bicolor*	swamp white oak
Betula alleghaniensis	yellow birch	*Quercus coccinea*	scarlet oak
Betula papyrifera	paper birch	*Quercus macrocarpa*	burr oak
Carex appalachica	Appalachian sedge	*Quercus rubra*	red oak
Carex crinita	fringed sedge	*Rosa carolina*	Carolina rose
Carex eburnea	Bristle-leaf sedge	*Rosa virginiana*	Virginia rose
Carex pensylvanica	Pensylvania sedge	*Rubus allegheniensis*	blackberry
Carex plantaginea	plantain sedge	*Rubus ideas*	red raspberry
Carya ovata	shagbark hickory	*Rubus occidentalis*	black raspberry
Castanea dentata	American chestnut	*Rubus odoratus*	flowering raspberry
Chamaepericlymenum canadense	bunchberry	*Salix discolor*	pussy willow
Corylus americana	American hazelnut	*Salix nigra*	black willow
Corylus cornuta	beaked hazelnut	*Solidago caesia*	wreath goldenrod
Crataegus crus-galli	cockspur hawthorn	*Solidago nemoralis*	gray goldenrod
Doellingeria umbellata	flat top aster	*Solidago odora*	sweet goldenrod
Eupatorium hyssopifolium	hyssop leaved boneset	*Solidago puberula*	downy goldenrod
Eupatorium perfoliatum	boneset	*Solidago sempervirens*	seaside goldenrod
Eurybia divaricata	white wood-aster	*Spiraea alba var. latifolia*	white meadowsweet
Eurybia macrophylla	big leaf aster	*Spiraea tomentosa*	steeplebush
Eutrochium fistulosum	hollow stem Joe-Pye weed	*Swida alternifolia*	pagoda dogwood
Eutrochium maculatum	spotted Joe Pye weed	*Swida amomum*	silky dogwood

Eutrochium purpureum	purple Joe-Pye weed	*Swida racemosa*	gray dogwood
Fagus grandiflora	American beech	*Swida sericea*	red twig dogwood
Fragaria vesca	woodland strawberry	*Symphyotrichum cordifolium*	blue wood aster
Fragaria virginiana	wild strawberry	*Symphyotrichum laeve*	smooth aster
Fraxinus americana	white ash	*Symphyotrichum novae-angliae*	New England aster
Fraxinus nigra	black ash	*Symphyotrichum novi-belgii*	New York aster
Geranium maculatum	wild geranium	*Tilia americana*	basswood
Helianthus divaricatus	woodland sunflower	*Tsuga canadnesis*	hemlock
Helianthus tuberosus	sunchoke	*Vaccinium angustifolium*	lowbush blueberry
Ionactis linariifolia	stiff aster	*Vaccinium corymbosum*	highbush blueberry
Juglans cinerea	butternut	*Vaccinium macrocarpon*	large cranberry
Juglans nigra	black walnut	*Vaccinium vitus-idaea ssp. minus*	Mountain cranberry
Larix laricina	tamarak	*Viburnum acerifolium*	maple leaf viburnum
Lupinus perennis	sundial lupine	*Viburnum dentatum*	smooth arrowood
Morella caroliniensis	bayberry	*Viburnum lantanoides*	hobblebush
Myrica gale	sweetgale	*Viburnum lentago*	nanyberry
Ostrya virginica	ironwood	*Viburnum nudum var. cassinoides*	withe-rod
Panicum virgatum	switchgrass	*Viburnum nudum var. nudum*	witherod
Picea glauca	white spruce	*Viburnum opulus var. americanum*	American cranberry bush
Picea mariana	black spruce	*Viburnum prunifolium*	smooth blackhaw
Pieris floribunda	fetterbush	*Viola pedata*	birds foot violet
Pinus rigida	pitch pine		

Data based on work done by Doug Tallamy, National Wildlife Federation, and The Natural History Museum. Data arranged by Dan Jaffe, djaffe@newenglandwild.org

Land stewardship, conservation spaces, and migration corridors

We have paved over the majority of the natural world in Somerville. The few trees and green spaces we do have are disconnected, and the use of non-native species has decimated our pollinators. However, we can repair some of these issues and increase our environmental health by:

- Designating conservation areas to protect from future development. Prospect Hill Park was recently protected in perpetuity and exemplifies this idea. An example of an area to protect is the wooded area below the Corbett-McKenna Playground.

- Buying properties that are empty or have buildings in disrepair, especially along highways, to plant for forested areas, native tree nurseries, meadows, parks, agricultural areas, and other green spaces, depending on site specifics. This could be through a land trust or a city land acquisition fund.

- Incorporating more native plants and natural vegetation in parks, playgrounds, and school yards to provide cognitive and stress-reducing benefits for children, in addition to creating additional wildlife corridors (Bagot et al 2015).

Bagot, Kathleen L., Felicity Catherine Louise Allen, and Samia Toukhsati. "Perceived restorativeness of children's school playground environments: Nature, playground features and play period experiences." *Journal of environmental psychology* 41 (2015): 1-9.

In addition, every attempt must be made to recreate ecosystems both on public and private land and connect green spaces to provide corridors for both humans and pollinators and other wildlife. "*Oslo, Norway is developing a different kind of wildlife corridor . . . it lacks the urban parklands and plants that pollinators such as bees need to survive and thrive. A new "bee corridor" gives the insects a network of pollen-producing plants. The bees can forage in one place before moving onto the next pit stop along the "highway." The bee-friendly venues include rooftop gardens and balconies where flowering plants are kept. The goal is to have pollen-rich habitats every 800 feet, so bees can enjoy a movable feast as they travel through Oslo."* (mnn.com)

Connectivity analysis can be used to determine the most effective way to link urban green spaces by considering all potential corridors (backyards, parks, forest fragments, playgrounds etc.). Such an analysis could suggest best practices for creating linkages between spaces to support wildlife populations at different scales. (Rudd et al 2002)

Rudd, Hillary, Jamie Vala, and Valentin Schaefer. "Importance of backyard habitat in a comprehensive biodiversity conservation strategy: a connectivity analysis of urban green spaces." *Restoration ecology* 10.2 (2002): 368-375.

Similar to Somerville's Neighborways project, connected green spaces would provide safe, healthy pathways for residents and visitors alike to travel.

Native Plant Ordinance

Whereas, the New England Native Plant Society recognizes the importance of native plants: "Plants are the basis of all life on the planet. Each native plant species supports insects, birds, animals, and other plants and microorganisms, and relies on them, in turn, for survival. The loss of a single plant species can lead to the collapse of related plant and animal species. In New England, where 593 species are now listed as rare or possibly extinct, it is vitally important to understand and protect our native plants."

Whereas, the EPA recognizes the importance of native plants: to reduce soil erosion, improve water quality, reduce air and noise pollution, for carbon storage properties, and beauty. It recommends that native landscaping is appropriate for homes, civic buildings, schools, and libraries, office campuses, institutional sites, parks, roadways, and stormwater conveyance and detention areas.

Therefore, Somerville will establish a Native Plant Ordinance.

All building sites, including city-owned or maintained, that are required to have landscaping will plant the landscape site area using 100% natives trees, 100% native shrubs, 100% native grasses and ferns, and minimum 60% native flowers. 50% minimum of all aforementioned plants will be wild (not cultivars). The plants must be chosen from the approved list on the Ecology document or from an established Massachusetts native plant list (e.g., Grow Native Mass: http://www.grownativemass.org/whatarenativeplants, New England Wildflower Society: http://www.newfs.org/conserve/state-of-the-plants) and planted according to established guidelines found elsewhere in this document.

Dark Sky Ordinance:

Whereas, the American Medical Association says the following:

• The AMA encourages communities to minimize and control blue-rich environmental lighting by using the lowest emission of blue light possible to reduce glare and negative impacts on human and wildlife health.

• The AMA recommends an intensity threshold for optimal LED lighting that minimizes blue-rich light.

• The AMA also recommends all LED lighting should be properly shielded to minimize glare and detrimental human health and environmental effects, and consideration should be given to utilize the ability of LED lighting to be dimmed for off-peak time periods.

AMA guidelines:
https://www.ama-assn.org/ama-adopts-guidance-reduce-harm-high-intensity-street-lights

Therefore, Somerville will adopt a Dark Sky Ordinance.

The International Dark Sky Association has made a template for municipalities to adopt, with five different lighting zones. The description is here:
http://www.darksky.org/our-work/public-policy/mlo/

The ordinance is here:
http://www.darksky.org/wp-content/uploads/bsk-pdf-manager/16_MLO_FINAL_JUNE2011.PDF

Green Factor

We applied the green factor as written in Somerville citywide proposed zoning and found that a developer could use porous pavers on their typically-sized parking lot and meet the green factor requirements. We determined that this is not acceptable. To be noted: in typical construction, porous pavers are built over asphalt and a few feet of soil, so the water is not connecting to the groundwater but instead making its way to the sewer system. And, porous pavers typically only remain porous for a year or two before they clog up. Then they flood and heave and the building owner usually has them sealed. So, in our example above, the green factor "benefits" would only be in effect for a year or so anyway.

Edits:

10.3 Green Factor
1.b. **Change to**, " . . . reduction of stormwater runoff, the improvement of urban air quality, provides habitat for birds and beneficial insects, mitigation of the urban heat island effect, improved soil quality, and improved well-being of residents and visitors."

2.b. **Remove** this section

3.a. **Change** "Director of Transportation & Infrastructure" to **"a committee comprised of (???)**" (suggestion: director of parks, tree warden, member of urban tree committee, member of conservation committee, alderman from OSEE committee, design review board member).

In Articles 3, 4, 5, and 6, the minimum green factor score should be **changed** to read as follows:
Residential: from .35 to **0.6**
Mid-rise: from 0.2 or .25 to **0.5**
High-rise: from 0.2 to **0.5**
Commercial: from 0.2 to **0.3**

Change TABLE 10.3 (a) Green Factor Calculation to the following:

TABLE 10.3
Pick *at least* one item from Engineered Systems(a) and one item from Plantings(b)

Engineered Systems(a)	**Multiplier**
Extensive green roof (sedum or similar), depth = 2 - 6"	0.3
Semi-intensive green roof (large shrubs), depth = 6.1 - 12"	0.7
Intensive green roof (farming or trees and large plants), depth = 12.1" and above	1.5

Vegetated wall	0.7
Bioswale/Bioretention/Raingarden	1.0

Plantings(b)

See section in Ecology document named “Companion Plantings” for options. These trees and shrubs are native and drought tolerant. See Vegetation Square Foot Size table (d) below.

Trees with companion plantings, large	1.0
Trees with companion plantings, small	0.8
Trees without companion plantings, large	0.5
Trees without companion plantings, small	0.4
Non-native large shrubs or perennials at least 3 ft. tall at maturity	0.1
Native large shrubs or perennials at least 3 ft. tall at maturity	0.4
Preserved trees (Minimum 6" in diameter at breast height)	1.0
Grass, living mulch, perennial ground cover, shrubs less than 3 ft. tall at maturity	0.1

For any item picked from the bonus category below, its multiplier should be added to the item(s) it applies to above

Bonus categories(c)

Landscaped area where at least 50% of annual irrigation needs are met through use of harvested rainwater	0.4
Minimum 25% of landscaping visible to passersby from adjacent public right of way or public open space	0.1
Landscaping 500 sq ft or more that is open to public use	0.3
Landscaping is for food cultivation	0.3
Landscaping connects to other green spaces	0.3
Landscaping is 100% organically maintained	0.6

Vegetation square foot size (d)

Tree, large	300 sq. ft. per tree
Tree, small	150 sq. ft. per tree
Preserved trees	20 sq. ft. per inch of trunk diameter 4.5 feet above grade
Large shrubs or perennials at least 3 ft. tall at maturity	12 sq. ft. per plant
Grass, living mulch, perennial ground cover, shrubs less than 3 ft. tall at maturity	sq. ft. of planted area

The following page shows a sample of Seattle's Green Factor assessment, which may be useful to replicate.

Any vegetation must contribute to groundwater recharge with proper filtration of potential pollution (including asbestos and heavy metals from vehicular components such as brake dust). Any vegetation deemed necessary to connect directly into public infrastructure (i.e. sewer-stormwater systems) must document the necessity and provide the calculation of contribution to that system (how much impact to that system). There may be a connective punitive measure (fines or higher taxes) for any contribution to the system above a certain metric (TBD).

The Office of Sustainability will perform an annual check-in of the site to determine current eligibility. A visual inspection will check for plant health and coverage, appearance of proper maintenance, upkeep, and cleanliness. Fines will be served for not meeting the score and bonuses awarded for improved scores (TBD).

In addition, annual soil samples will be tested by the property owner or their designated replacement by using one of the following tests: the Haney Soil Test or the Solvita Soil Test. The results will be submitted to the City. Property owners must keep documentation and data on current soil conditions.

SEATTLE×green factor

FINAL VERSION 3-9-07

	enter sq ft of parcel		You need at least 0.300
Parcel size *(ENTER THIS VALUE FIRST)**	29,035	SCORE	0.301

	Types of Area**		Square Feet	Factor	Total
A	**Vegetation planted with a soil depth of less than 24"**				
1	Lawn or grass pavers or ground covers		enter sq ft: 1424	0.2	285
2	Plants and shrubs 3' and higher at maturity	enter number of plants: 0	0	0.3	-
B	**Vegetation planted with a soil depth of more than 24"**				
1	Lawn, grass pavers or other plants less than 3' tall at maturity		enter sq ft: 4179	0.7	2,925
2	Shrubs taller than 3' at maturity - calculated at 16 sq ft per plant (typically planted no closer than 18" on center)	enter number of plants: 227	3632	0.3	1,090
3	Tree canopy for "small trees" in SDOT's Street Tree Planting Schedule or equivalent canopy spread of 15' - calculated at 50 sq ft per tree	enter number of plants: 35	1750	0.3	525
4	Tree canopy for "small/medium trees" in Street Tree Planting Schedule or equivalent canopy spread of 20' - calculated at 100 sq ft per tree	enter number of plants: 0	0	0.3	-
5	Tree canopy for "medium/large trees" in Street Tree Planting Schedule or equivalent canopy spread of 25' - calculated at 150 sq ft per tree	enter number of plants: 8	1200	0.4	480.0
6	Tree canopy for "large trees" in in Street Tree Planting Schedule or equivalent canopy spread of 30' - calculated at 200 sq ft per tree	enter number of plants: 0	0	0.4	-
7	Tree canopy for preservation of "exceptional trees" or trees with trunk diameter exceeding 24" at four and one half feet above the ground. calculated at 250 sq ft per tree	enter number of plants: 1	250	0.5	125.0
8	Permeable paving that drains only itself. It must be at grade. - calculated per square foot		enter sq ft: 381	0.6	228.6
C	**Green roofs** - 4" minimum soil depth at time of planting		enter sq ft: 2047	0.7	1,432.9
D	**Vegetated walls**		enter sq ft: 732	0.7	512.4
E	**Water features (fountains) or rain gardens** (where allowed by SPU)		enter sq ft: 0	0.7	-
		sub-total of sq ft =	*15,595*		
Bonuses					
F	**Landscaping using drought tolerant plants or where at least 50% of annual irrigation needs are met from non-potable sources**		enter sq ft: 7,071	0.1	707
G	**Landscaping visible to passers-by from adjacent public right of way or public open spaces**		enter sq ft: 4,400	0.1	440
			green factor numerator =		*8,751*

**** Do not count public rights of way in parcel size calculation.***

***** To calculate your green factor score, you may count the landscape elements that are in public rights of way if they are contiguous with the parcel.***

Green Roof Ordinance

Green Roof Definition: a treatment to a roof that supports living vegetation and includes a synthetic, high quality waterproof membrane, drainage layer, root barrier, soil layer and all supporting vegetative growth.

Whereas, green roofs provide significant benefits to environmental and human health and wellbeing, and

Whereas, green roofs**:**

- reduce stormwater runoff and associated flooding
- sequester carbon
- clean the air
- lower the urban heat island effect
- lower the cooling costs of the building
- provide habitat for pollinators
- provide health benefits of green space to people
- extend the lifespan of the roof
- can make a building quieter
- are aesthetically pleasing
- can grow food
- contribute to LEED points
- increase real estate value

Therefore, Somerville will adopt a green roof ordinance. All new construction buildings with a gross floor area larger than 10,000 square feet must have a green roof of at least 50% of the roof footprint. Additions to existing buildings currently over 7,500 sq. ft. must have a green roof on 50% of newly constructed roof area.

Green roofs must demonstrate the ability to absorb 1” of rain from a 24-hour rain event.

Installation and Maintenance Standards: Somerville will develop installation and maintenance standards. Toronto has well developed policy that can be used as basis of standard: https://www1.toronto.ca/wps/portal/contentonly?vgnextoid=77420621f3161410VgnVCM10000071d60f89RCRD and https://www.toronto.ca/wp-content/uploads/2017/08/7eb7-Toronto-Green-Roof-Construction-Standard-Supplementary-Guidelines.pdf

Example Performance Standards:
Submittal of maintenance reports (minimum of 3x/year) and photo documentation is required to demonstrate that proper maintenance is occurring to ensure maximum public benefit. Submittal of maintenance report is required for a minimum of 10 years from the date of building occupancy. Somerville will provide best practices and maintenance protocol to guide building owners. Improper maintenance or lack of maintenance report submission will result in notice of non-compliance status. Buildings that remain in non-compliance for greater than 6 months will received a fine (TBD) that will be issued every 4 months thereafter.

Optional Green Roof Tax Credit:
In addition to the requirement for large commercial construction is the option of a tax credit available to all building owners (including those required to implement a green roof). Vegetated roof systems that follow approved standards will receive a tax credit at a rate of $5/square foot (a typical low maintenance sedum succulent roof than can absorb 1" rain in 24 hours costs $12-20/square foot). To comply, building owners must agree to a 3-year maintenance protocol that includes minimum of three annual visits.

Other Cities' Green Roof Policy Advocacy for reference:

Cambridge, MA: Floor Area Ratio (FAR) exemption for buildings that include green roofs; as part of Zoning Ordinance Article 22. Article 22 is Cambridge's effort to promote green building requirements to implement environmentally sustainable and energy-efficient design and development practices. The requirement extends to both new construction and renovation projects. The regulations include design standards that apply to new construction and renovation projects of a significant size.

https://www.cambridgema.gov/~/media/Files/CDD/ZoningDevel/Ordinance/zo_article22_1397.ashx (page 4: Section 22.30, Green Roofs)

Nashville, TN: $10 per square foot rebate for green roofs that meet city requirements.

http://www.nashville.gov/Water-Services/Developers/Low-Impact-Development/Green-Roof-Rebate.aspx

Denver, CO: Requirement that 20-60% of roof must be vegetated (depending on size of building) for buildings greater than 25,000 square feet.

https://www.denverpost.com/2017/11/09/denver-green-roof-initiative-dps-board-race-margins/

Portland, OR: $5 per square foot rebate and requirement for city-owned new buildings and roof replacements greater than $500 square feet.

Milwaukee, WI: $5 per square foot rebate.

https://www.buildings.com/article-details/articleid/17253/title/budding-success-with-green-roof-incentives

Philadelphia, PA: Tax credit for 25% of cost of green roof up to $100,000. Roofs must follow specific set of guidelines. Passed by city council in 2007 as part of effort to address citywide stormwater infrastructure improvements.

https://beta.phila.gov/media/20160925174047/Green-Roof-Tax-Credit-Overview-Revised-July-20-2016.pdf

Air quality:

Place “no idling signs” by all city-owned facilities. Enforce this.

Buildings:

Towers need bird collision deterrents to avoid birds flying into windows. Toronto does this.

Article 3 Residential districts: **ADD** Front yards of residences may not be paved.

Community Gardens:

11. Public Realm, 7. Civic Uses, d. Definitions and Standards, xii Urban Agriculture, a) Development Standards, xi **ADD**: Community gardens must be open and accessible to the public.

Parking lots:

Article 12.2 2 Parking Lots - does not mention landscaping. Bioswales are an effective way of collecting and managing stormwater that runs off of a parking lot. They should be installed in parking lots at a minimum 5% of the total surface area.

Playgrounds:

11. Public Realm, 7 Civic Uses d. Definitions and Standards, ix Playground
    a) vi) **ADD**: woodchips are recommended
    b) Design Guidelines vi) Natural Play areas . . . **REPLACE** “recycled plastic” WITH “wood”

ADD: Every new construction or renovation of an existing playground must be 50% minimum green, planted nature.

Roofs:

All roofs on commercial, high-rise, and mid-rise buildings must be able to structurally support solar panels, green roofs, and/or water collection.

The City should consider allowing multiple, adjacent buildings to form a cooperative system to share the different elements (one roof all solar, one all green, another collects water).

Parking garages are required to have a green roof with a minimum 12” depth.

Solid Waste:

The language in the proposed zoning code regarding recycling containers in conjunction with litter containers is good. The only **addition** to this section would be to include signage on the containers, in at least English, Spanish, Portuguese, and Haitian Creole, at a level visible to children and people in wheelchairs, to explain what can go into each container. It is recommended that images, in addition to words, be used on the sign. In addition, a brief explanation of why recycling is important is recommended.

Stormwater Management Standard:

The Somerville Green Standard for stormwater management focuses on 1) reducing the quantity of stormwater runoff by requiring onsite reuse, infiltration, or evapotranspiration and 2) improving the quality of stormwater runoff that discharges to sanitary sewers and the Mystic River. The draft Somerville zoning language includes requirements for green space but does not include any performance criteria for stormwater management. Stormwater management performance standards are recommended for inclusion in the new zoning language.

Proposed Somerville Stormwater Management Standard

10.9 Sustainable Development

1. Green Buildings

    a. New construction or alterations between 25,000 and 50,000 SF of gross floor area must be LEED Silver certifiable.

    b. New construction or alterations greater than 50,000 SF of gross floor area must be LEED Gold certifiable.

2. Green Roofs & Storm Water Management

    a. Retain at least the first 0.25” from each rainfall through storm water reuse, on-site infiltration, evapotranspiration, or other management method approved by the City Engineer.

    b. Post-development annual runoff volume shall not exceed 40% of average annual rainfall depth.

    c. Post-development peak discharge rates shall not exceed pre-development peak discharge rates.

    d. Remove 80% of average annual post-construction load of total suspended solids. Calculation shall be based on the Massachusetts DEP Stormwater Handbook.

    e. The Planning Board may authorize the City Engineer to grant a credit to properties, against which any storm water impact fees are imposed, equivalent to the quantity of storm water that is removed from entering the system through the use of green roofs or other onsite storm water management practices.

Transportation:

Current zoning draft does not appear to have any Electric Vehicle (EV) charging station requirements. This needs to be addressed.

Utilities:

City must use the maximum possible percentage of renewable energy in all city-owned and maintained facilities; if it is below 100%, this must be reevaluated annually.

Burying utility wires would improve the aesthetics of the City. This needs to be considered.