

# WINCHESTER COMPREHENSIVE PLAN 2022

## CHAPTER FIVE

### ENVIRONMENTAL SUSTAINABILITY

This chapter explains how Winchester should reduce impacts on the natural environment. Nature's bounty attracted early settlers, and stewardship of nature remains part of the local culture. The city advances the eleven objectives below because damage to the natural environment imposes real costs on residents, businesses, and government. Winchester's past success relied on nature, and the city will continue a tradition of stewardship to promote future growth.

#### Citywide Environmental Objectives

As noted in Chapter 3, City Council identified eleven citywide Environmental Sustainability objectives to address the citywide goal of *proactively improving environmental sustainability and reducing Winchester's impact on the natural environment*. This chapter explains what is already happening with each objective and what can be done in the future to further environmental sustainability. The eleven objectives are:

- 1) Reduce exposure of the public to hazardous environmental conditions.
- 2) Other than downtown, discourage new development within identified floodplain fringe areas and mitigate the impacts of existing development within mapped floodways.
- 3) Work with the private sector as well as federal and state agencies to remediate brownfield sites, including railroad properties, within the city.
- 4) Promote water quality implementation plans and minimum control measures for stormwater management.
- 5) Work with surrounding jurisdictions as well as federal and state agencies to (a) monitor air and water quality; and (b) address regional environmental issues such as air quality, water quality, and solid waste management.
- 6) Reduce the city's carbon footprint and overall environmental impact on air quality by examining the way City business is conducted daily and encouraging residents and businesses to do their part as well to create a more sustainable and responsible community.
- 7) Explore alternative to continue viable recycling and reuse while seeking new markets for recyclable materials and decreasing the waste stream to the landfill.

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- 8) Develop a more environmentally sustainable approach to handling urban stormwater runoff resulting in less detrimental impacts on our local streams and on downstream areas.
- 9) Preserve, restore, and create wetlands, wildlife corridors and other habitats
- 10) Preserve healthy, mature trees, and promote an increase in the City's urban tree canopy.
- 11) Pursue changes to development regulations to encourage the use of environmentally friendly site measures such as pervious paving, 'Green' building techniques, natural landscaped areas, and low impact development techniques.

### **1. Reduce exposure of the public to hazardous environmental conditions.**

Several kinds of environmental hazards threaten Winchester's residents, businesses, and visitors. Three of the most prominent are air pollution, water pollution, and dangerous chemical spills.

In recent years, Winchester has managed to meet EPA standards for ground-level ozone. While ozone gas high in the atmosphere reflects radiation, at ground level it is harmful to human life. Ozone puts children and the elderly especially at risk on hot summer days. Certain other gases and particulate matter also pose immediate and long-term health hazards. Relatively few are monitored regularly.

Pollution also threatens Winchester's five creeks and streams. Contaminated streams support less wildlife, have less recreational value for the city, and contribute to the poor health of the Chesapeake Bay and other drainage areas.

For both air and water pollution, federal laws create penalties which threaten a city's business prospects. If a city fails to meet the standards of the Clean Air and Clean Water Acts, there are federally required obstacles to new business development. If Winchester does not improve local air and water quality, developing new housing and jobs will be more difficult. The other objectives of this chapter detail how the city will reduce environmental hazards to protect both local jobs and public health.

Winchester maintains other efforts to reduce the public's exposure to environmental hazards. The building code enforcement staff cites instances of lead paint, asbestos, and other household toxins. The fire department works with local industry to prevent accidents and spills. Emergency responders cooperate with Frederick County and state authorities to prepare comprehensive responses and maintain hazardous materials (HazMat) systems to document hazards and respond to incidents.

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### 2. Other than downtown, discourage new development within identified floodplain fringe areas and mitigate the impacts of existing development within mapped floodways.

Floodplains exist along each of the city's five streams: Abrams Creek, Buffalo Lick Run, Hogue Run, Redbud Run, and Town Run. The city should continue to enforce its Zoning Ordinance provisions related to designated floodplain districts. City officials should also continue to coordinate with the Federal Emergency Management Agency (FEMA) to update the floodplain maps when and where needed.

Building on a floodplain presents a danger to the builder and to the broader community. A flood may destroy one property, but the debris may also pollute waters and threaten other families and businesses. About seven percent of the city's area is at risk of 1% annual chance flood event. That means that in any given year, there is a one percent chance of flooding in the orange area shown in the map below. It includes sections of Old Town, where property owners can seek exemptions to reinvest into historic structures.



#### Map of Winchester's 100-year floodplain

Redbud Run encompasses a very small area at the extreme north end.

Town Run extends from the hospital through Old Town and merges with Abrams Creek near the university. It includes an unnamed tributary in the vicinity of Opequon Ave and S. Pleasant Valley Rd.

Abrams Creek generally parallels Jubal Early Drive through the center of the city.

Buffalo Lick Run is the only waterway originating in the city. It generally parallels E. Tevis Street.

Hogue Run extends along much of the southern boundary of the city.

Winchester's relatively flat land area reduces flood risks. The highest point, in the west central area, is 940 feet above sea level, and the ground slopes down 300 feet to the Route 50 interchange. Winchester's modified continental climate, with mild winters and warm and humid summers, presents flood risks if spring rains combine with snowmelt or after heavy summer storms. However, the area does not have a rainy season where flooding is common.

The city's Zoning Ordinance discourages new development within the floodplains and mandates actions needed to reduce the risk to buildings there. For example, existing manufactured buildings must be anchored firmly "to prevent collapse, floatation, or

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lateral movement.” The lowest floor of new buildings must be above the level of the 1% annual chance. Within the flood plain, low intensity uses like farming, outdoor recreation, and gravel parking lots are allowed. Exceptions to the building restrictions consider set criteria including risk to the builder, other citizens, the clean water supply, and emergency responders. Retrofits to old buildings, particularly those located in the historic district, in the floodplain require the same review as new construction.

Actions which slow stormwater runoff, include but are not limited to removing channeled flow, “daylighting” streams, preserving, restoring, and creating wetlands, restoring floodplain functions, planting trees, reducing impervious surfaces, and utilizing natural landscaping to reduce the risk of flooding. By better managing stormwater, these actions described later in the chapter may shrink the area of the 1% annual chance flood plain while also reducing pollution and creating opportunities for recreation and the enjoyment of nature.

### **3. Work with the private sector as well as federal and state agencies to remediate brownfield sites, including railroad properties, within the city.**

Brownfield sites are abandoned or underused industrial or commercial lots containing toxic waste or contaminants. A brownfield site is often blighted, reducing surrounding property values. Improving brownfield sites thus yields environmental, economic, and social benefits as the city gains a cleaner, more productive, and more attractive new site.

City staff should update an inventory of brownfield land within city limits. The City Code (§6-133) provides for the abatement of commercial or industrial blight. If a brownfield site can be remediated, it may be a prime candidate for commercial infill redevelopment because of a good location and low price. An example of this is the Federal-Mogul site which has extensive frontage along S. Pleasant Valley Rd. Winchester should encourage appropriate redevelopment of its brownfield lands.

Railroads own some brownfield property near the intersection of Wyck St. and Fairmont Ave. and on the west side of N. Kent St., just north of Baker St. Spilled fuels and chemicals along the tracks create blight and safety risks to surrounding homes and businesses. Public works, police, and other city staff should work with railroads to improve the appearance and environmental sustainability of Winchester’s rail corridors and railroad-owned properties. As city staff find evidence of contamination on brownfield properties, the City or the Economic Development Authority should partner with appropriate state and federal authorities, as well as the private sector, to clean the sites and make them safe for the public and for redevelopment.

### **4. Promote water quality implementation plans and minimum control measures for stormwater management.**

Abrams Creek and the downstream section of Opequon Creek are on the state’s impaired waters list for excessive bacteria and an inability to support aquatic life. Since 2003, the

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state Department of Environmental Quality has issued Total Maximum Daily Load (TMDL) regulations prescribing the reduction in pollutants necessary to meet water quality standards for the Abrams and Opequon Creek watersheds. Sediment is the primary stressor on aquatic resources. The City completed a state required TMDL Implementation Plan to outline measures to meet pollution reduction goals in 2015.

The Opequon TMDL Implementation Plan recognizes inadequate urban stormwater management as a major cause of the listed impairments to water quality. The Plan recommends a suite of stormwater best management practices (BMPs) that reduce runoff and pollutant loading of local streams as well as Opequon Creek, the Potomac River, and the Chesapeake Bay.

Due to Winchester's population density and water quality impairments, the state has designated it a Municipal Separate Storm Sewer System (MS4) community. The MS4 program is an EPA mandate under the Clean Water Act that is administered by the state. MS4s must develop a Stormwater Quality Management Plan (SWQMP). This action plan for the MS4 entails six requirements, or minimum control measures (MCM):

1. Public Education and Outreach
2. Public Involvement and Participation
3. Illicit Discharge Detection and Elimination
4. Construction Site Storm Water Runoff Control
5. Post-Construction Storm Water Management in New Development and Redevelopment
6. Pollution Prevention/Good Housekeeping for Municipal Operations Maintenance.

In response to the Clean Water Act the Environmental Protection Agency (EPA) developed a TMDL or "pollution diet" for the Chesapeake Bay. The EPA also required each state adjoining the Bay to submit a Watershed Implementation Plan which identifies measures to reduce the amount of nitrogen, phosphorus, and sediment entering the Bay from all major sources, including sewage treatment plants, industrial facilities, urban areas, agriculture, forestry, and septic systems. Winchester submitted a TMDL action plan for the Chesapeake Bay in 2015.

**5. Work with surrounding jurisdictions as well as federal and state agencies to (a) monitor air and water quality, and (b) address regional environmental issues such as air quality, water quality, and solid waste management.**

The federal Environmental Protection Agency (EPA) and the state Department of Environmental Quality (DEQ) are Winchester's most important partners for the issues of air and water quality as well as solid waste management. Federal law sets basic standards for defining, measuring, and monitoring pollution, in addition to enforcement. On some issues, state law goes further, and state staff are responsible for monitoring and enforcing many federal standards. DEQ also promotes cooperation between Virginia's cities and counties. The Northern Shenandoah Valley Regional Commission (NSVRC) is one example of such cooperation.

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To enforce the federal Clean Air Act, DEQ monitors air quality in the Shenandoah Valley. In the past, the region failed to meet air quality standards, especially for ozone. Some air pollution comes from homes and businesses here, some comes from heavy truck traffic on the highways, while more still comes from factories and power plants farther west. The Blue Ridge and Allegheny Mountains trap polluted air and cause it to settle in the valley. Winchester should continue to seek feedback from the EPA, DEQ, and the National Weather Service regarding air quality. State and federal agencies provide Winchester with the latest research, monitoring, and data on other localities. The partnership between Northern Shenandoah Valley jurisdictions (such as through the NSVRC) and environmental scientists at James Madison University on such programs as Shenandoah Air Quality (SHENAIR), and the joint Winchester/Frederick County ValleyAirNow should be continued.

While ozone is of serious concern, so are other pollutants in the air: particulate matter, volatile organic compounds (VOC), nitrogen oxide compounds (NO<sub>x</sub>), and carbon emissions. The EPA has standards on each of these (and some others) that are being (or may be in the future) tightened. Winchester is just below the current standards on some of these. Further EPA reduction will put Winchester, and surrounding areas, in noncompliance. Because the air quality issues are regional in nature, Winchester must act in full coordination with surrounding jurisdictions to address these issues. Failure to do so has the potential to negatively impacting the future economic development and public health of Winchester and surrounding areas.

Several data sources exist on the health of the local streams in Winchester and of the rivers and streams, including Opequon Creek, into which they flow. Among the groups collecting such data are the Virginia DEQ; The Opequon Watershed (TOW), Inc.; Friends of the Shenandoah River (FOSR); Virginia Tech; and Shenandoah University's Environmental Studies Department. No regularly scheduled monitoring occurs at present. Nevertheless, past records and reports allow City staff to address water quality management issues. City staff should continue to seek feedback from the DEQ, citizens groups and universities, and the City should support efforts to monitor and evaluate progress towards cleaning Winchester's waters.

The state establishes water quality standards in addition to standards that regulate the quantity of stormwater runoff. Additional water quality standards are pending adoption at the state level as described above under Objective 4. To help fund mandated improvements, the City has considered the establishment of stormwater management fees, but additional calculation of private impervious acreage would be needed before a fee could be properly established. Numerous voluntary measures to improve water quality such as establishing natural landscaping areas can be taken by the City, businesses, and private landowners.

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### **6. Reduce the city's carbon footprint and overall impact on air quality by examining the way City business is conducted daily and encouraging residents and businesses to do their part to create a more sustainable and responsible community.**

Winchester lacks data on its overall carbon emissions, and the city's influence on regional air quality, national energy imports, or global climate is difficult to determine. However, some practices reduce carbon footprint while reducing energy consumption, improving air quality, and yielding other benefits.

The city's finance office collects energy expenses from each city department and can present energy costs in the city's budget. The budget for fiscal year 2021, which begins on July 1, 2020, should include an energy category showing city spending on electricity, heating, and vehicle fuels. Each city department, as appropriate, has a separate budget line for electricity, heating, and fuel, which are listed in the annual budget. Winchester should reduce energy spending as a proportion of the city budget during every fiscal year.

Each city department should attempt to reduce its energy costs in ways that do not harm, but rather improve, service delivery. These practices preserve the environment and reduce waste of the public's tax dollars. Examples include:

- Increasing walking and bicycle police patrols (pictured)
- Expanding telework options for city staff
- Configuring city computers with power-saving settings
- Gradually replacing windows and light fixtures with more efficient models
- Gradually replacing city vehicles with more efficient models
- Replacing HVAC systems and components with more energy efficient models.
- Using rechargeable batteries in Parking meters



Reducing use of cars is one of the best ways for a family or business to reduce energy costs. Chapter Six of this plan details mobility and how personal cars should become less necessary in Winchester through compact mixed-use development and improved biking, walking, and bus options. Chapters Nine, Ten, and Eleven of this Plan provide specific objectives for developing Winchester into a more walkable city where cars are not needed for every errand or for every household.

Objective 11 below, on green buildings, notes how the city should use the Zoning Ordinance, permitting process, and tax code to encourage construction with less environmental impact. Currently, Winchester exempts solar energy equipment from property tax, but more could be done to create front-end incentives or assist with financing. Finally, the City, through its resources, should inform households and businesses seeking to reduce their energy consumption that the City has passed new incentives. Recently Winchester has implemented the Commercial Property Assessed Clean Energy (CPACE) program, which allows businesses to get funding for energy

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efficient upgrades. This program can be utilized both in expanding existing properties and in development of new properties.

### **7. Explore alternatives for viable recycling and reuse while decreasing the waste stream to the landfill.**

In 2018, the city collected 6,464 tons of refuse. The city operates a weekly curbside refuse collection service and collects up to three 45-gallon containers from each home and business. Winchester sends its garbage to the Frederick County Landfill, a jointly owned regional landfill situated east of the city. The landfill has equipment to generate some electricity by burning the methane gas produce as garbage decomposes.

To encourage recycling, the city also provides a weekly curbside recycling program and provides bins to homes and businesses. In 2018, the city collected 2,908 tons of recycling.

In 2019, the City's recycling partner, Southern Scrap, discontinued their operations as a material reclamation facility (MRF). Because of this, the city has begun to take plastic bottle and can recycling to Republic Services, and paper and cardboard recycling to Maryland Paper. The recycling of glass bottles has, unfortunately, had to cease.

While 30 percent recycling exceeds the state guidelines, reducing waste is even more efficient than recycling. City staff should study means to encourage further recycling and discourage waste. Possible efforts include, but are by no means limited to:

- Public service announcements and public advertising
- Placing more recycling containers in public areas and facilities
- Charging a fee for each container of garbage collected
- including a credit for recycling
- Encouraging a local MRF to develop

### **8. Develop a more environmentally sustainable approach to handling urban stormwater runoff resulting in less detrimental impacts on our local streams and on downstream areas.**

The area's geology heightens the importance of water quality. The City of Winchester and the surrounding area is underlain by a band of carbonate bedrock consisting primarily of limestone which is commonly referred to as Karst terrain. Karst terrain is characterized by the presence of sinkholes, surface depressions, springs and a highly irregular pinnacled bedrock soil interface in which groundwater is extremely susceptible to contamination from surface activities. Winchester should reduce the polluting impacts of heavy rains' runoff to both groundwater and surface waters. This includes local streams as well as areas downstream of Abrams Creek and other City drainage sheds that are tributaries to Opequon Creek, the Potomac River, and the Chesapeake Bay.



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Restoring, preserving, and creating wetlands are all aspects of more sustainable handling of stormwater runoff. Winchester should also replace acres of impervious surfaces (i.e., asphalt, concrete, etc.) with pervious surface. When rain falls on pavement, it does not sink into the ground. Instead, it flows downhill into the storm drain system and then quickly to the local creeks, still containing pollutants. Quickly swollen streams also create a flash flood risk.

Low Impact Development (LID) is an alternative to conventional stormwater management. LID is a site design strategy with the goal of maintaining or replicating the predevelopment hydrologic response using certain design techniques to create a functionally equivalent hydrologic landscape. Some of these functions include water storage, infiltration, and groundwater recharge as well as management of the volume and frequency of water discharges. Elements of LID include minimizing land disturbance, limiting impervious surfaces, and utilizing runoff reduction practices such as pervious pavements and naturally landscaped areas.

Several alternative surface improvements are available that are pervious and can aid in stormwater management and runoff reduction, including permeable pavers, grass pavers, and permeable concrete. These materials allow rainwater to drain into the subsoil without sacrificing much strength. City staff should promote pervious surfaces for new construction and in the replacement of current parking lots. The city should use pervious surfaces in public streets, parking lots, and paths where appropriate. And it may use the Zoning Ordinance to cap the maximum size of parking lots for different kinds of businesses. The use of natural landscaping in other locations such as open spaces, channels/ditches, stormwater detention areas and other stormwater management structures will result in a significant reduction of stormwater pollution while reducing maintenance costs. City staff should promote their use and other low impact development methods such as rain gardens as appropriate in new construction and on existing sites.

### **9. Preserve, restore and create wetlands, wildlife corridors, and other habitats.**

Winchester should commit to restoring and preserving the city's historic wetlands. In the previous century, to control flooding and water-borne diseases, many of the city's wetlands were destroyed. Many of the town's creeks now run through concrete channels and pipes. The concrete streams do not slow, cool, or filter stormwater very well, so they pollute our local streams and eventually Opequon Creek, the Potomac River, and the Chesapeake Bay. Concrete streams offer little habitat for wildlife, and they have little aesthetic value for residents.

Winchester should protect and restore more natural corridors to connect existing wildlife habitats and create larger, contiguous green areas. Restored stream corridors would enhance the Winchester Green Circle, shown in the map below. This multi-use trail connects natural areas and historic sites with neighborhoods and major employment and shopping areas and is discussed in Chapters Six and Eight.

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The concrete channels which currently contain many of the city's streams may be demolished to connect them with their floodplains. Restored stream banks may be built and seeded with native plants. Restored streams should maintain at least a 35-foot riparian buffer on each bank as per the current City Code. In addition, streams currently covered can be "daylighted" to improve habitat and water quality.

At present, much of Winchester's rainwater runs through concrete pipes and storage tanks. Hot, polluted stormwater pollutes local streams. Winchester needs acres of new ponds, rain gardens, and similar green that is a naturally landscaped drainage space. These spaces have both environmental and aesthetic value, filtering runoff while providing habitat for wildlife and scenery for residents and tourists. Public or private land may be used, as well as land, which is not suitable for building, like the floodplain. The City has a few large-scale stormwater facility projects in the works that will reduce runoff. This includes the N. Cameron/N. Kent project and the Hope Dr/Tevis projects. Both will result in large detention facilities located adjacent to the CSX railroad corridor.

Correctly designed rain gardens and naturally landscaped drainage spaces hold stormwater for less than 24 hours. Mosquitoes need standing water for at least four days to breed. So, wetlands protection, restoration, and creation need not lead to increased mosquito problems. Indeed, new natural habitats should enlarge the bird, bat, and dragonfly populations which eat thousands of mosquitoes daily.

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### **10. Preserve healthy, mature trees, and promote an increase in the City's urban tree canopy.**

Trees play an important role in Winchester's health as a city. A tree-lined block has higher property values by improving public health through preventing ozone pollution and catching particulate matter. They sustain the environment by filtering stormwater and sheltering wildlife and reduce energy consumption by shading buildings and houses. They provide social goods to everyone who walks, plays, or picnics under their branches or enjoys their fall colors. Investing in trees provides decades of benefits to Winchester's residents and visitors for surprisingly little cost.

As city staff work with residents and businesses to add nearly 30,000 new trees to Winchester's streets, yards, and parks, a parallel effort should preserve the city's many stately, mature trees. The city arborist and public works staff recognize the value of great trees, however the presences of overhead electric phone and CATV lines limits our ability to plant large trees. Their broad shade beautifies the city and efficiently protects the public from pollution. Particulate matter and ozone gas pollute the air near the ground and threaten human health, especially in children and the elderly. Trees capture floating dust, and their leaves slow the formation of ozone near the ground during hot summer days.

Maintaining mature trees involves protecting the root zone, pruning, fertilizing, and protecting them from pests and disease. The arborist and staff should partner with state and federal agencies to remain alert to new insects and diseases, acting where possible. The arborist should also help citizens interested in preserving mature trees on private property.

City staff should plant many new native trees on public land, parks, medians, and so on. The Adopt-a-Tree program allows individuals to plant trees on public land. However, newest native trees must be planted on private property. So, the city should publicize tree planting and Arbor Day community engagement. Planting appropriate species on steep slopes prevents soil erosion and uses land which cannot be built upon.

The City should also collaborate with large landowners to create new tracts of forest. Shenandoah University, Winchester Medical Center, the Museum of the Shenandoah Valley could provide many new acres of urban tree canopy. So could several industrial and commercial sites, particularly in the south central and southeast planning areas, where trees are needed most. Winchester has several underdeveloped sites where unsightly, or excessively paved, abandoned business property could be improved by tree planting as part of blight abatement. In those cases, improving the tree canopy not only benefits public health, but it also helps make a blighted neighborhood more attractive to new residents and businesses. The map on the next page shows which parcels in Winchester have the best tree canopies and which parcels need the most improvement.

Overall, approximately 61% of Winchester can absorb storm water well. Green and yellow areas have pervious surfaces which best allow for absorption. Gray areas, making

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up over a quarter of the City's land cover, consists of non-building impervious surfaces, such as sidewalks and pavement, do not absorb storm water, and channel polluted stormwater directly into streams.

### **Urban Tree Canopy Map**

Source: Virginia Tech

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### **11. Pursue changes to development regulations to encourage the use of environmentally friendly site measures such as pervious paving, ‘Green’ building techniques, natural landscaped areas, and low impact development techniques.**

Some city development regulations and practices neglect environmental sustainability. The City should consider the natural, as well as the business, impact of new construction. The City and private civil engineers should encourage the use of pervious pavement and other environmentally sustainable site development practices. Many of these make a business more profitable over time.

The U.S. Green Building Council is a non-profit organization that administers the Leadership in Energy and Environmental Design (LEED) program. LEED is a formal certification that a building or community was designed and built sustainably for energy savings, water efficiency, air quality, and stewardship of resources and sensitivity to their impacts. Features of “green buildings” include insulated windows, lights with motion sensors, recycled materials, rain gardens, and solar panels, among many others. For slightly higher initial construction costs, green buildings prevent waste in operating costs over time, particularly as energy prices increase. Several Virginia jurisdictions have policies or laws establishing LEED certification of public building projects. New public building and renovation projects in Winchester should strive for at least the minimum level of LEED certification. Winchester currently promotes LEED developments by allowing a density bonus with LEED certification. This is difficult to take advantage of, however, as LEED certification is only given after the development is completed, complicating any attempt to award the bonus prior to actual construction without LEED certification.

Due to the difficulty of promoting LEED, Winchester should consider promoting alternatives, such as Low Impact Developments (LID), and incentivizing actions such as including detention and/or retention ponds, alternative energy sources, and additional greenspace beyond site requirements.

Good stewardship of the environment is critical to the long-term sustainability of the City. With increased environmental mandates from the state and federal government, Winchester needs to be proactive in taking a leading role in requiring higher levels of environmental stewardship with public projects and in delivering public services. It also needs to encourage the private sector to better realize the true costs of unsustainable practices within regard to long-term economic sustainability and quality of life.