Environmental Action Plan

Phase I

Created by Harrisonburg City Staff and the Environmental Performance Standards Advisory Committee

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Acknowledgements

The City of Harrisonburg expresses appreciation to all the individuals who contributed to the preparation of this document.

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Introduction

The Environmental Action Plan (EAP) is a guide for city leaders, staff, and community members to implement sustainability visions and principles. Sustainability is described by the US Environmental Protection Agency (US EPA) as "based on a simple principal: Everything that we need for our survival and well-being depends, either directly or indirectly, on our natural environment. To pursue sustainability is to create and maintain conditions under which humans and nature can exist in productive harmony to support present and future generations."[1] To-date, the City of Harrisonburg has taken steps to address the quality and care of our natural resources; however, the latest science indicates that more ambitious actions are required to mitigate the impacts of environmental degradation and the changing climate that will affect our community's health, economy, and well-being.

Protection of natural assets such as air, streams, mountains, trees, open space, and important views are critical to maintaining Harrisonburg's quality of life. The quality of the physical environment – attractive streets, buildings, parks, and open space – has a direct impact on Harrisonburg's economy, the well-being of its neighborhoods, and the successful stewardship of its unique natural and cultural resources. The community expects a high level of excellence in building design, streetscapes, pedestrian amenities, preservation of special spaces, conservation of natural resources, and enhancement of community distinctiveness. Protecting our natural environment, supporting a wide range of social and cultural amenities, and providing ongoing educational opportunities are the building blocks for attracting new residents and businesses, as well as, encouraging our current residents and businesses to stay.

It should also be acknowledged that sustainability is also about difficult choices and trade-offs today to maintain or improve quality of life in the future. Like many other communities, the City of Harrisonburg is faced with numerous current and future challenges such as flooding, extreme fluctuation in weather, aging infrastructure, increased energy costs, and supply of water as our demands increase. Effectively preparing for and responding to current and projected climate change requires an ongoing evaluation and a series of action steps, not a one-time assessment. It calls on our community to adopt policies and practices that make environmental sustainability and resilience a part of the comprehensive planning of our community. It also calls on us to strengthen existing efforts and build partnerships throughout the community to reduce Harrisonburg's vulnerability to the changing environment.

The development of the EAP is designed to accomplish this goal. The EAP acknowledges existing city plans, programs and strategies, and builds upon them by proposing measures to accelerate advancements in sustainability, of which economic vitality, environmental protection, and health and well-being are collectively considered to be critical pieces of achieving sustainability goals and reducing greenhouse gas emissions. Adopting and implementing the EAP helps the City support global targets for a stable climate and a resilient community. The plan includes recommended policy changes in the public sector and incentives in the private sector, as well as, recommended actions for both the public and private sectors.

Implementing policies and incentives for our City not only addresses environmental concerns but will also have many co-benefits. For example, improving access to multi-modal transportation improves public

[1] https://www.epa.gov/sustainability/learn-about-sustainability#what

health, improves air quality, reduces congestion, and increases safety. Communities that make sustainable development choices are better positioned to preserve landscapes, support robust food systems, and maintain the health and integrity of watersheds, forests, and wildlife habitats.

Environmental Performance Standards Advisory Committee

The Environmental Performance Standards Advisory Committee (EPSAC)[2] was established by City Council in 2017 as an advisory committee to help the City "create a set of environmental performance and sustainability standards for public and private development and redevelopment projects." The development the EAP Phase 1 has been a collaborative effort between members of EPSAC and City staff.

Community Input

The draft EAP was presented to the public at an Open House meeting on June 5, 2019. Approximately 50 members of the public attended to learn more about the process and the plan. Comments were solicited in writing from June 5 through June 26 and then reviewed by city staff and EPSAC members and the EAP was revised. Over 40 community members and community groups submitted written comments.

Scope of Plan and Plan Organization

The EAP is organized into six ***focus areas***, areas in which action can be taken to improve the environment and sustainability (Buildings and Energy, Land Use and Green Space, Regional Food Systems, Sustainable Transportation, Waste Reduction and Recycling, and Water Resources). Each focus area has ***goal statements***, which are overarching statements describing the direction the community wants to go. Goal statements describe a desired end state for each focus area and reflect the values of the community. Goal statements are qualitative in nature. Each goal has a section that answers the question: ***Where are we now?*** The City has already taken steps to achieve some goals. When relevant, those actions and initiatives are summarized under each goal statement. This section does not include actions or initiatives by private businesses or community organizations. Each ***strategy*** within the goal describe *possible* approaches and methods for attaining the goal. The ***tasks*** listed for each strategy are *possible* actionable items that are steps towards meeting each strategy. Strategies and tasks may be implemented by city departments, Harrisonburg City Public Schools, Harrisonburg Electric Commission, private businesses, community organizations, or individuals.

Adoption of the EAP does not immediately establish new regulations, policies, or budgets to implement the plan. As previously stated, the EAP is a guide for city leaders, staff, and community members to implement sustainability visions and principles. As the City considers implementation of strategies and tasks, cost-benefit analyses will be conducted as part of decision-making. Additionally, implementation of any specific strategy or task is dependent on City Council's approval and appropriation of funding.

The City and the community are also not limited to implementing only the strategies and tasks described in the EAP nor must specific strategies and tasks described in the EAP be utilized. There will be instances when new, unforeseen opportunities arise that would support particular goals, but the opportunity was

[2] https://www.harrisonburgva.gov/epsac

not identified as a potential strategy or task in the EAP. Likewise, the City and the community might also find that an identified strategy or task is not feasible or no longer appropriate.

The EAP also includes incentives and suggestions for making changes in the private sector. Since Virginia is a Dillon Rule state, the City can only regulate the private sector on matters where the State General Assembly has expressly granted the ability for the City to do so by statute, private act, or charter. For example, the EAP can outline ways to encourage and incentivize private citizens to reduce plastic consumption, but it cannot suggest the City adopt a regulation to ban plastic shopping bags in the City because the General Assembly has not authorized the City to do so. It is the City's hope that community members and community organizations will use the EAP to identify tasks where they can take a leadership or supporting role. Community members and community organizations can look at the responsible parties identified as "individuals" and "community organizations" for various strategies and tasks described in the EAP.

Focus Areas

1. ***Buildings and Energy:*** Improving energy efficiency and reducing energy use in buildings will reduce greenhouse gas (GHG) emissions. There are opportunities to promote energy generation on-site at public and private properties. There are also ways to reduce the energy consumption of the water and sewer systems that provide services to properties in Harrisonburg.
2. ***Land Use and Green Space:*** Regulating and guiding the sustainable use of publicly-owned and privately-owned lands and green spaces provides opportunities for promoting positive social and environmental outcomes and an efficient use of resources.
3. ***Regional Food Systems:*** A food system is generally understood to be the chain of activities connecting food production, processing, distribution, consumption, and waste management. Helping people to understand how the dozens of choices they make every day (what we eat, what we buy, how we use or consume these items, and how we dispose of them) impacts the community will contribute to a sustainable food system and a healthy environment.
4. ***Sustainable Transportation:*** Sustainable transportation includes alternative fuel public transportation fleets, increasing usage of public transportation, traffic signal optimization, increasing bicycle and pedestrian options, and more.
5. ***Waste Reduction and Recycling:*** The City of Harrisonburg seeks to determine a sustainable, long-term, and fiscally responsible refuse and recycling program that consistently supports and promotes the reduction of solid waste, the reuse of usable items, and the recycling of materials.
6. ***Water Resources:*** The watersheds and water systems we depend on to provide clean drinking water must be protected for public health as well as health of aquatic ecosystems. Water resources can be protected by managing drinking water sources, water use, the sanitary sewer system, and stormwater runoff.

Goals

Guiding Goals

1. Continue to Advance Sustainability Initiatives in the Community
2. Reduce Overall, Community-Wide Greenhouse Gas Emissions and the Intensity of Greenhouse Gases Emitted from Different Activities
3. Continue to Grow and Deepen Local Partnerships in Order to Further the Implementation of the Environmental Action Plan (EAP)

Focus Area 1 - Buildings and Energy

1. Encourage Producers of Electricity Supplied to the City to Include More Carbon Free Sources
2. Understand the City's Energy Use
3. Decrease Energy Use Intensity of Municipal Buildings
4. Decrease Energy Use Intensity of City School Buildings
5. Optimize Energy Use of Water Operations
6. Encourage Efforts to Improve Energy Efficiency and Increase Renewable Energy and Sustainable Energy Sources

Focus Area 2 - Land Use and Green Space

1. Modernize and Establish Enduring Land Use and Development Patterns
2. Maintain and Create a Well-Distributed and Accessible Parks and Recreation System
3. Maintain and Increase a Healthy Tree Canopy
4. Evaluate Opportunities for Underutilized Public and Private Lands and Consider Opportunities to Rehabilitate and Create New Natural Habitats

Focus Area 3 - Regional Food Systems

1. Promote Accessibility to Local, Healthy, and Sustainably Produced Food
2. Support Sustainable Food Production, Selection, Distribution, and Disposal Practices

Focus Area 4 - Sustainable Transportation

1. Develop an Alternative Fuel Fleet Program
2. Implement Sustainability Practices into Municipal Fleet Management
3. Increase Public Transit Ridership
4. Traffic Signal Optimization and Timing Improvements
5. Support Alternative and Low-Carbon Forms of Transportation and Improved Fuel Efficiency
6. Continue to Coordinate Land Use Planning and Regulations with Transportation Planning

Focus Area 5 - Waste Reduction and Recycling

1. Support and Promote the Reduction of Refuse in Landfills
2. Support and Promote the Reuse of Usable Items
3. Support and Promote Recycling
4. Support and Promote Healthy and Safe Solid Waste Disposal

Focus Area 6 - Water Resources

1. Protect and Secure Drinking Water Sources
2. Implement the Water Use and Water Loss Management Plans
3. Protect Stream Health Through Sanitary Sewer Management
4. Protect and Enhance Water Quality of Surface Water and Stormwater Runoff

EAP Phases of Development

The development of the EAP will be completed in three phases (1, 2, and 3). This document represents Phase 1 and describes goals, co-benefits, and strategies, and identifies tasks and responsible parties (such as a city department, private businesses, community organizations, or individuals). This document is intended to lay the groundwork for future phases of EAP development and implementation of strategies towards environmental sustainability.

Phase 2 will involve inventorying (gathering data and studying) municipal and community activities to develop baselines to be later used for measuring progress towards achieving goals. For example, Goal 1 includes a strategy to complete municipal and community-wide greenhouse gas emissions inventories. The inventories will provide a snapshot in time of greenhouse gas emissions coming from different sources.

During Phase 3, the City will consider baseline data gathered and all learned information, establish targets with statements that define a percentage reduction or increase by a specific year. For example, during Phase 2, for *Goal 3 of Focus Area 2 – Maintain and Increase a Healthy Tree Canopy,* the City might choose to inventory tree canopy cover using available aerial photography and planimetric surveys from 2015. The baseline could be represented as either the total acreage of tree canopy cover in the City or a percentage of the City covered by tree canopy. Then during Phase 3, a target might be developed to state "Maintain an overall tree canopy of at least 40 percent by the year 2030."

It is likely that Phase 2 and Phase 3 will occur at the same time as different baselines and targets may take longer than others to determine. Additional updates to the EAP, particularly with goals and strategy statements may also occur at this time. The updated EAP will be presented to City Council for consideration to adopt.

Guiding Goals

The EAP and implementation of the EAP are influenced by three guiding goals which are summarized as acting sustainably (Guiding Goal 1), reducing greenhouse gas emissions (Guiding Goal 2), and growing local partnerships to further the implementation of the EAP (Guiding Goal 3).

Guiding Goal 1 – Continue to Advance Sustainability Initiatives in the Community

As previously stated, sustainability is described by the US Environmental Protection Agency (US EPA) as "based on a simple principal: Everything that we need for our survival and well-being depends, either directly or indirectly, on our natural environment. To pursue sustainability is to create and maintain conditions under which humans and nature can exist in productive harmony to support present and future generations." The National Environmental Policy Act (NEPA) of 1969 committed the United States to sustainability, declaring it a national policy "to create an maintain conditions under which humans and nature can exist in productive harmony, that permit fulfilling the social, economic, and other requirements of present and future generations."[3]

[3] https://www.epa.gov/sustainability/learn-about-sustainability#what

Sustainability has three main pillars or three bottom lines: environmental, social, and economic summarized by the University of Maine as:[4]

1. ***Environmental sustainability***: Our most basic requirements: unpolluted air, clean water and fresh food, all come from our environment, as does the energy and raw materials we need for construction and transportation. Environmental sustainability is essential if we wish to have and continue to have the resources to meet our needs. In the broadest sense of the definition, environmental sustainability involves the entire global ecosystem (oceans, freshwater systems, land, and atmosphere). However, environmental sustainability principles can equally be applied to ecosystems of any size, even down to the scale of a small home garden.
2. ***Social sustainability*:** A socially sustainable society is one in which all members have equal rights, all share equitably in societal benefits, and all participate equally in the decision-making process. Additionally, a society is unsustainable if it consumes resources faster than they can be renewed naturally, discharges more waste than natural systems can assimilate without degrading, or depends upon distant sources for its most basic requirements.
3. ***Economic sustainability*:** Economic sustainability is about much more than the sustained growth of resources and profit margins. Economic sustainability takes into account the social and ecological consequences of economic activity. We need to carefully consider the full life-cycle of our goods, from extraction of raw materials, through processing, manufacture, distribution, use, maintenance, repair, and eventual recycling or disposal.

Strategy 1.1 – Evaluate a Potential Sustainability Coordinator Position

A "sustainability coordinator" could coordinate and support the goals of the EAP. Responsibilities of a sustainability coordinator vary across localities but generally involve managing, facilitating, and advising the development, implementation, monitoring, and improvement of City policies, programs, and initiatives that promote local environmental, energy, economic, and social sustainability. Examples of work they might do include, but are not limited to: leading the planning of city sustainability initiatives and programs; directly managing sustainability initiatives and programs; facilitating collaboration of interdepartmental/agency task forces, teams and working groups; coordinating the management, measuring, and monitoring of sustainability initiatives and programs; promoting sustainability with city staff; communicating sustainability goals and progress to the public; engaging with community/stakeholder groups (e.g. neighborhood organizations, environmental advocates); and applying for grant funding to support sustainability efforts.

Task	Responsible Party
Evaluate existing department duties and the need for a Sustainability Coordinator Position	City Manager's Office, City Departments
If needed, create a job description for a Sustainability Coordinator and determine reporting structure (who the position reports to).	City Manager's Office, City Council
If needed, budget for and hire a Sustainability Coordinator.	City Manager's Office, City Council

[4] https://umaine.edu/sustainability/what-is-sustainability/

Strategy 1.2 – Continue to Seek Ways to Improve Community Resilience to Changing Environmental Conditions

Resilient communities are able to minimize disasters and are capable of bouncing back from adverse situations. They do this by actively influencing and preparing for social, economic, and environmental change by identifying vulnerabilities and opportunities, planning for forthcoming disasters, and acting to become more resilient. While resiliency planning can be applied to preparing for and responding to natural and human-made disasters as well as economic collapse, the focus of the EAP is on the environment and environmental sustainability.

Task	Responsible Party
Continue to seek ways to improve community resilience when considering new and changes to existing policies, procedures, programs, and projects.	City Departments, Community Organizations, Private Businesses
Continue to seek opportunities for partnership, collaboration, and potential co-benefits, such as air-pollution impacts, community health, reduced fuel costs, employment and economic development opportunities, etc.	City Departments, Community Organizations, Private Businesses

Strategy 1.3 – Ensure Environmental Benefits and Risks are Fairly and Justly Distributed in Our Community

Communities of color and low-income communities are disproportionately impacted by, and vulnerable to, climate change because they often possess few adaptive resources to recover after disasters.

The US Environmental Protection Agency (US EPA) describes environmental justice as "fair treatment and meaningful involvement of all people with respect to development, implementation, and enforcement of environmental laws, regulations, and policies. Fair treatment means that no population bears a disproportionate share of negative environmental consequences resulting from industrial, governmental, and commercial operations or policies. Meaningful involvement means people have an opportunity to participate in decisions about activities that may affect their environment and/or health; the public's contribution can influence the regulatory agency's decision; community concerns will be considered in the decision-making process; and decision makers will seek out and facilitate the involvement of those potentially affected."[5]

[5] https://www.epa.gov/environmentaljustice/learn-about-environmental-justice

Guiding Goal 2 – Reduce Overall, Community-Wide Greenhouse Gas Emissions and the Intensity of Greenhouse Gases Emitted from Different Activities

Gases that trap heat in the atmosphere are called greenhouse gases (GHGs). The main GHGs are carbon dioxide, methane, nitrous oxide, and fluorinated gases. The Earth is habitable because of a natural greenhouse effect brought about by water vapor and carbon dioxide. However, humans are altering the relative composition of atmosphere by introducing excess greenhouse gases into the atmosphere, mainly by burning fossil fuels. The additional carbon dioxide traps radiation in the atmosphere, amplifying the natural greenhouse effect, and producing warming. Warming is manifested in many ways, not just increasing surface temperatures, but also melting ice, and changing the hydrological cycle and rainfall patterns. If GHG emissions continue as they have, the earth is on course to rise 3-5 degrees Celsius (5.4-9.0 degrees Fahrenheit) or more by the end of the century according to the World Meteorological Organization (WMO).[6] This could create a rise in sea level, collapse ocean fisheries, create more frequent extreme weather events, and place predictable agricultural conditions in jeopardy. Reduction of GHG emissions in the public and private sector is a goal that cuts across all the focus areas.

Strategy 1.1 – Complete a GHG Emissions Inventory

The first step towards reducing GHG emissions is understanding where our emissions are coming from. There are two inventories that should be completed for Harrisonburg: a municipal inventory, which would capture emissions created by municipal operations and a community-wide inventory which includes emissions created by municipal operations as well as the Harrisonburg community. Both inventories will consider electricity, natural gas, transportation fuels, and waste used and generated by buildings, vehicles, and other operations.

Task	Responsible Party
Become a member of ICLEI.[7] Local Governments for Sustainability (ICLEI), formerly the International Council for Local Environmental Initiatives, provides tools and support for local governments to inventory greenhouse gas emissions.	City Manager's Office, City Council
Complete a community-wide GHG emissions inventory.	City Department TBD
Complete a municipal GHG emissions inventory.	Facilities Manager
Measure progress by conducting new community-wide and municipal inventories. (It is recommended that community-wide inventories be completed once every two years and municipal inventories be completed once every three to five years.)	City Department TBD, Facilities Manager

[6] https://public.wmo.int/en/media/press-release/wmo-climate-statement-past-4-years-warmest-record
[7] http://icleiusa.org/

Strategy 1.2 - Set Targets for GHG Emission Reductions

Set targets for GHG emissions reductions for the City of Harrisonburg based on best available science and maximum extent practicable. Hundreds of communities across the US have set targets, including the following Virginia communities: Town of Blacksburg, the Cities of Charlottesville, Roanoke, and Richmond, and Arlington and Fairfax Counties. Meeting community-wide targets will require action from the whole community.

Task	Responsible Party
Analyze the emissions inventories and recommend to City Council targets for reductions.	City Departments, EPSAC
Set targets for GHG emissions reductions. Recommendations will be presented by EPSAC and city staff during Phase 3 of EAP development and presented to City Council to consider for adoption.	City Council

Guiding Goal 3 – Continue to Grow and Deepen Local Partnerships in Order to Further the Implementation of the Environmental Action Plan (EAP)

Many ecosystem challenges cross jurisdictional boundaries and require systemic changes beyond the capabilities of individual local governments. The City should build on existing partnerships and establish new partnerships through collaboration across levels of government and with community organizations and businesses to further the implementation of the EAP.

Strategy 1.1 – Continue Building on Existing Partnerships and Establish New Partnerships

Task	Responsible Party
Continue to participate in the City/James Madison University (JMU) Liaison Committee.[8]	City Council
Continue to participate in the City/Eastern Mennonite University (EMU) Liaison Committee.	City Council
Continue to participate in the City/Rockingham County Liaison Committee.[9]	City Council
Continue to participate in other regional boards and commissions.[10]	City Council, City Manager's Office, City Departments
See related tasks and existing and potential partnerships throughout the EAP document.	

[8] The City/JMU Liaison Committee is composed of two members of City Council and the City Manager who meets with the JMU President and their leadership team. The committee meets quarterly and is an opportunity to provide updates on significant projects, and an opportunity to discuss timely and important issues. https://www.harrisonburgva.gov/jmu-liaison-committee

[9] The City/Rockingham County Liaison Committee is composed of two members of City Council and two members of the County Board of Supervisors, as well as, the City Manager and County Administrator. The committee meets quarterly and is an opportunity to provide updates on significant projects, and an opportunity to discuss timely and important issues. https://www.harrisonburgva.gov/city-county-liaison-committee

[10] https://www.harrisonburgva.gov/regional-boards-commissions

Focus Area 1 - Buildings and Energy

Commercial and residential buildings account for 39 percent of carbon dioxide emissions in the United States annually, due to heating, cooling, lighting, and powering electrical equipment (United States Green Building Council). Improving energy efficiency and reducing energy use in buildings will reduce greenhouse gas (GHG) emissions. Electricity generation and use is a one of the several major contributors of GHG emissions in the US. The Harrisonburg Electric Commission (HEC), which is a municipally owned utility that serves all residential and non-residential uses within the City, does not generate electricity for sale, but purchases electricity from Dominion Energy and distributes electricity to customers. When HEC was created by City Council in 1956, it was created such that the electric system was free from the jurisdiction, direction, and control of other city officers, employees, and the City Council.[11] Six goals are included in this focus area.

Co-Benefits

Co-Benefits of improving energy efficiency and reducing energy use in buildings include: saving money through reduced costs for heating and cooling, improved thermal comfort and indoor air quality, local jobs in the energy efficiency field, hedging against utility price increases and improved health.

Goal 1 – Encourage Producers of Electricity Supplied to the City to Include More Carbon Free Sources

Electricity generation and use is one of the major sources of greenhouse gas (GHG) emissions in the United States and Harrisonburg is no exception. There is growing recognition of the urgency of significantly reducing GHG emissions. State and local governments in Virginia and throughout the United States are responding with a variety of initiatives for renewable, carbon free, carbon neutral, net-zero, and green energy expansion and innovation.[12]

HEC currently purchases electricity from Dominion Energy and distributes electricity to its customers. HEC does not generate any electricity under its current Dominion contract.[13]

[11] HEC's charter is contained within Title 8 of the City Code, which, among other things, describes City Council's appointment of HEC commissioners, HEC's powers in operating the City's electric system, a contribution of 5% of HEC's gross revenues to the City's general fund plus an amount equivalent to such city taxes as would assessible if the electric system were not municipally owned.

[12] For example: On September 17, 2019, Virginia Governor Ralph Northam set a goal for Virginia to produce 100% of its electricity from carbon free sources by 2050; On September 21, 2019, Arlington County has established targets of 50% renewable electricity for government operations by 2022 and 100% by 2025, and a goal for the community achieving 100% renewable electricity by 2035; On September 12, 2019, Dominion Energy announced plans to develop what will be the largest wind farm on the East Coast; On September 17, 2019, Duke Energy announced its commitment to cut carbon emissions from electricity generation to net-zero by 2050; As of Fall 2019, Montgomery County, MD is considering requiring solar panels on new construction; and on August 2, 2019, the Sierra Club reported that one in four Americans now live in a community committed to 100% clean energy.

[13] In January 2011, through a contract with the Virginia Municipal Electric Association (VMEA), in which HEC is one of seven members, HEC entered a 20-year power supply contract with Dominion Energy. The contract remains in effect through May of 2031. The contract is a full requirements contract, which means that HEC cannot purchase power from any other entity nor can it build generation, renewable or otherwise, to offset energy purchases from Dominion. Additionally, the retail customers of HEC may not enter into contracts to purchase power from any other entity; however, rooftop solar

Strategy 1.1 – Identify Opportunities to Increase Carbon Free Sources Of Electricity

Task	Responsible Party
Encourage HEC and its supplier Dominion Energy to find opportunities for including more carbon free sources of electricity.	City Council, Community Organizations, Individuals
Partner with local government advocacy organizations (Virginia Municipal League, Virginia First Cities) and with other communities across Virginia to advocate for policies that expand on renewable energy generation and deployment of distributed energy infrastructure.	City Council, Private Businesses, Community Organizations, Individuals

Goal 2 - Understand the City's Energy Use

Creating an inventory of energy used by municipal operations is the first step to understanding energy consumption and areas that could be improved upon.

Where Are We Now?

Initiative	Summary	Status
Create and support the Facilities Management Program	Harrisonburg has a Facilities Manager who monitors energy use in municipal buildings.	Complete

Strategy 2.1 – Conduct an Inventory of Energy Used by Municipal Operations

The energy inventory would describe energy use of different areas of municipal operations, including, but not limited to: fleet vehicles, buildings, street lighting, and distribution of water and sanitary sewage.

Task	Responsible Party
Create a standard operating procedure for the inventory, including: what software will be used to complete the inventory, and what should be included (electric, gas, water, and sanitary sewer)	Facilities Manager
Complete the inventory. Include local partners such as universities or private consultants.	Facilities Manager
When an energy inventory is completed, to establish an inventory maintenance plan that includes how often the inventory should be updated and who is responsible.	Facilities Manager
Share findings of energy inventory with other city departments and the public.	Facilities Manager, Director of Communications

installations by its customers are allowed behind the customer's meter under HEC's parallel connection agreement (net metering agreement).

Goal 3 - Decrease Energy Use Intensity of Municipal Buildings

Energy Use Intensity, or EUI, expresses a building's energy use as a function of its size and other characteristics. It is usually expressed as energy per square foot per year and is calculated by dividing the total energy consumed by the building in one year by the total gross floor area of the building.

Where Are We Now?

Initiative	Summary	Status
Facilities Management Program	The Facilities Manager coordinates maintenance and energy efficiency upgrades on municipal buildings.	Complete

Strategy 3.1 – Create a City Internal Energy Team (EIT)

The Internal Energy Team (IET) may consist of current staff members and/or new positions that will be trained in a high level of proficiency in HVAC, electrical, and plumbing skills, specifically focusing on energy efficient design.

Task	Responsible Party
Create an Internal Energy Team (IET). The IET would be led by the Facilities Manager.	Facilities Manager, City Manager's Office
Assess municipal buildings, facilities, and energy uses to identify maintenance needs and capital improvements. All buildings should be audited initially, and then conditioned or occupied buildings should be audited every five years.	IET
Establish an operations and maintenance program and capital improvement schedule, prioritized based on needs and available funding.	IET
Create procedures so that the IET is consulted on the design of mechanical/electrical/plumbing/architectural finishes in new building and retrofit projects so the team's knowledge and expertise of equipment and systems maintenance can be incorporated in design decisions.	IET

Strategy 3.2 – Consider Establishing an Energy Efficiency and Healthy Building Standard

Design and construct municipally-owned buildings and facilities to be energy efficient and "healthy". Healthy buildings are not just energy efficient but increase the health, productivity, and quality of life of building user by considering factors such as air quality, thermal control, lighting, workplace ergonomics and environmental quality, access to the natural environment, and land use and transportation.

Task	Responsible Party
Create a policy that requires the most recent edition of the International Energy Conservation Code (IECC) to be used in the design of municipal projects, including major retrofits. Where the most recent edition of the IECC is more stringent than the currently adopted Virginia Energy Conservation Code, the provisions of the most recent edition of the IECC should be adhered to. The same criteria should apply to all major retrofits.	IET
Use healthy building standards when designing new construction or retrofit projects.	IET
Create a process to check commissioning reports after project completion to ensure that all systems and components newly installed or retrofitted are designed, installed, tested, operated, and maintained according to the operational requirements and expectations.	IET

Strategy 3.3 - Consider Establishing a Cost Analysis Standard

Cost analysis allows for a fuller understanding of the total costs of a project over time and will help the decision-making process.

Task	Responsible Party
Develop a cost-analysis methodology for new municipal construction or retrofit projects. The analysis should consider construction type and materials used and life cycle costs as well as anticipated operating costs.	IET
Create a policy that requires a cost-analysis be performed on new construction or retrofit projects. The cost-analysis will allow for a full understanding of the total costs of construction or retrofit projects over time, as well as anticipated benefits.	IET

Strategy 3.4 - Consider Generating Energy On-Site

On-site energy generation will be encouraged and planned for to reduce the amount of on-grid energy used for things like heating, cooling, and powering electrical equipment.

Task	Responsible Party
Create a procedure for determining the cost effectiveness of on-site energy generation that weighs the pros and cons of each project. This procedure will be used to determine if on-site energy generation will be pursued in different locations.	IET
If feasible, construct new municipal buildings so they are solar photovoltaic installation ready.	IET
Investigate existing municipal buildings and facilities for possible solar photovoltaic installation on rooftops and as ground arrays.	IET
If life-cycle analysis shows on-site energy generation to be cost effective, actively pursue funding and installation of solar photovoltaic arrays.	Facilities Manager, City Manager's Office

Goal 4 - Decrease Energy Use Intensity of City School Buildings

Energy Use Intensity, or EUI, expresses a building's energy use as a function of its size and other characteristics. It is usually expressed as energy per square foot per year and is calculated by dividing total energy consumed by the building in one year by the total gross floor area of the building. Implementation of the following strategies and tasks are the responsibility of Harrisonburg City Public Schools.

Where Are We Now?

Initiative	Summary	Status
Division Leaders	HCPS is creating a culture of conservation and energy efficiency at all division owned and maintained facilities.	Ongoing

Strategy 4.1 - Consider Creating a Superintendents Advisory Committee on Energy Conservation

Harrisonburg City Public Schools (HCPS) will consider creating an advisory committee composed of students, faculty, administrators and external stakeholders.

Task	Responsible Party
Establish the Superintendent's Advisory Committee on Energy Conservation (SACE).	HCPS Assistant Superintendent of Operations
Establish a baseline EUI for each division-maintained building.	HCPS SACE
Complete an energy audit of each division-maintained building.	HCPS SACE
Develop a written report outlining HCPS's current energy conservation steps and develop actionable recommendations to reduce the division's EUI.	HCPS SACE

Strategy 4.2 - Consider Establishing an Energy Efficiency and Healthy Building Standard

All school division owned buildings and facilities will be designed and constructed with consideration of energy efficiency and cost analysis.

Task	Responsible Party
Require the most recent edition of the International Energy Conservation Code (IECC) to be used in the design of school division projects, including major retrofits. Wherever the most recent edition of the IECC is more stringent than the currently adopted Virginia Energy Conservation Code, the provisions of the most recent edition of the IECC should be adhered to. The same criteria should apply to major retrofits.	HCPS Central Office Administration
Develop a cost-analysis methodology for school division new construction or retrofit projects. The analysis should consider construction type and materials used.	HCPS Central Office Administration
Require cost-analysis on new construction or retrofit projects. The cost-analysis will allow for a full understanding of the total costs of construction or retrofit projects over time.	HCPS Central Office Administration

Strategy 4.3 - Consider Generating Energy On-Site

On-site energy generation will be encouraged and planned for in order to reduce the amount of on-grid energy used for things like heating, cooling, and powering electrical equipment.

Task	Responsible Party
Investigate school division owned buildings and facilities for possible solar photovoltaic installation. Pursue funding and installation if life-cycle analysis shows the project to be cost-effective. Ground arrays should also be included in the analysis.	HCPS SACE, HCPS Central Office Administration
If cost-effective, consider constructing new school division owned buildings so they are solar photovoltaic installation ready.	HCPS Central Office Administration

Goal 5 - Optimize Energy Use of Water Operations

The Department of Public Utilities (HPU) is responsible for providing water services to approximately 16,000 residential and commercial customers in the City of Harrisonburg and some parts of Rockingham County. Raw water supply from four sources, treatment, and distribution of the water are all parts of HPU operations. There are energy needs associated with each part of these operations and HPU strives to make the most effective use of energy.

Where Are We Now?

HPU has been making efforts to strategically improve water distribution so that system assets use less electrical power. HPU does this in four ways: load reduction, system configuration, optimization of component efficiencies, and optimization of use within the electrical rate structure. These improvements

in water distribution are incorporated into the Potable Water System Management Plan and Raw Water Supply Management Plan. HPU has decreased electrical consumption by 936,771 kilowatt hours per year (or by 21%) during the last five years. HPU energy directed activities since 2006 have reduced electrical energy consumption intensity by 17% from 1,845 kW-hrs/MH to 1,528 kW-hrs/MG.[14]

Initiative	Summary	Status
Energy Load Reduction	In Harrisonburg, the water system has zones with unique energy load requirements. To reduce the energy load, some water customers have been moved into more efficient zones. The run times on pumps have decreased to reduce the amount of electricity used and increase the lifespan of the pumps.	Ongoing
System Configuration	HPU strives to configure the water supply system so that water is pumped against the least resistance possible.	Ongoing
Optimization of Component Efficiencies	Components of the water distribution make a big impact on energy use and efficiency. When possible, HPU makes changes or replaces components such as pump and motor units.	Ongoing
Optimized Use Within the Electrical Rate Structure	Electrical companies provide incentives within their rate structure to encourage more use during lower demand periods and less use during higher demand periods. HPU can work in-sync with the electrical company through best management practices and enhancing the maturity of the computerized Supervisory Control and Data Acquisition (SCADA) System.	Complete
Potable Water System Management Plan	HPU's Energy Use Management Plan is being drafted into a new "Potable Water System Management Plan" with general principles and strategies for optimizing energy usage in Public Utilities operations. The Plan identifies benchmarks in kilowatt hours of electricity used per million gallons water usage. The Plan recommends that strategies must remain consistent with water operations permit obligations and recommends that all investments must meet financial payback goals within the lifecycle of the new asset.	Ongoing
Raw Water Supply Management Plan[15]	HPU's Energy Use Management Plan was first written into the "Raw Water Supply Management Plan" under topics for normal operations. Included are guidelines for optimizing water source selection and for determining benchmarks for water and electrical energy consumption	Complete

[14] City's Green Efforts - Electrical Optimization Strategy
https://www.harrisonburgva.gov/sites/default/files/green/Green%20Effort%20Lowers%20Water%20Costs.pdf
[15] Raw Water Supply Management Plan (RWSMP)
https://www.harrisonburgva.gov/sites/default/files/Water/Operations/Raw%20Water%20Supply%20Management%20Plan%2006.2019.pdf

Strategy 5.1 - Continue to Optimize Energy Use by Implementing Existing HPU Plans	
Task	**Responsible Party**
Continue to develop and support energy management into the goals of the Raw Water Supply Management Plan; refine the opportunities for energy management in configuring, commissioning, using and retiring system assets.	Public Utilities
Consider refining the goals of energy management into the "Potable Water System Management Plan" including opportunities to engage 1) energy efficient system architecture, 2) asset management best practice principles, 3) technology advancements, 4) building energy management 5) coordination with the electrical purveyor to shed energy usage during peak load periods and 6) considerations for alternative energy sources.	Public Utilities

Goal 6 – Encourage Efforts to Improve Energy Efficiency and Increase Renewable Energy and Sustainable Energy Sources

While reduction of energy use plays a big role in decreasing energy dependence, an increase in the percentage of energy produced by renewable and sustainable sources can also help Harrisonburg enhance its energy resilience. Renewable and sustainable energy sources are not limited to solar photovoltaic, but may include solar hot water installations, wind power generation, geothermal energy capture, methane capture from wastewater treatment, landfill operations, and more.

While the City is not able to require energy use reduction on private property, there are ways to advocate and incentivize energy efficiency and energy use reduction.

Where Are We Now?

Initiative	Summary	Status
Harrisonburg Electric Commission (HEC) Home Energy Audit Program[16]	HEC has a Home Energy Audit Program where energy audits can be requested to help homeowners better understand where energy (heat) is being lost in their homes. Current program does not have the capacity to handle interest.	Ongoing
HEC Energy Share Program[17]	A program where HEC customers can donate a set amount or round up their monthly electric bill to assist those in need. Currently, additional monies collected are equally split between the Salvation Army and People Helping People.	Ongoing
HEC Net Metering Program[18]	HEC offers a net metering program for customers who wish to generate a portion of their own power using solar panels.	Ongoing
Renewable Energy Certificates (REC)[19]	HEC offers an existing program allowing customers to purchase offsets to their carbon-based energy use from energy that was generated from solar power in the Commonwealth of Virginia.	Ongoing

[16] https://www.harrisonburgelectric.com/programs/energy_audit
[17] https://www.harrisonburgelectric.com/programs/energy_share
[18] https://www.harrisonburgelectric.com/go_green/net-metering/
[19] https://www.harrisonburgelectric.com/go_green/renewable_energy

Strategy 6.1 – Encourage Energy Use Reduction Initiatives in Residential and Non-Residential Buildings and Operations

Task	Responsible Party
Encourage community organizations to work together to create and promote resources that homeowners, renters, businesses, and industries can utilize to identify efficient and simple upgrades and reduce energy waste. Partners/organizations may include, but are not limited to, real estate agents and builders.	Community Organizations
Establish an energy audit program and promote the advantages of energy audits and weatherization.	Community Organizations
Consider promoting the advertisement of high-performance homes and living units in the real estate market by publishing the advantages of energy efficient properties to homeowners, renters, and rental companies.	Community Organizations
Promote establishment an accessible residential weatherization program for people in need.	Community Organizations
Consider a program where HEC customers can donate toward a fund for helping those in need to weatherize their homes. HEC would collect the donations and a community organization would provide the service.	HEC, Community Organizations
Evaluate a "peak demand shaving" program where residential and non-residential customers would be incentivized to reduce energy use during peak demand periods by way of a water heater switch.	HEC
Create and promote resources that business owners and industries can utilize to identify efficient and simple upgrades and reduce energy waste.	Community Organizations

Strategy 6.2 - Encourage the Construction of High-Performance Buildings and Operations

Task	Responsible Party
Explore the use of financial incentives to encourage the construction of high-performance buildings in the private sector and increase the performance of existing properties. Incentives could be applicable to property owners performing alterations and additions.	Community Organizations
Explore the use of financial incentives to encourage the use of renewable and sustainable energy sources, including but not limited to solar photovoltaic, solar hot water installations, wind power generation, geothermal energy capture, methane capture from wastewater treatment and landfill operations, and more.	Community Organizations
Promote energy efficient and high-performing rental (residential and non-residential) properties through publicizing the advantages of these properties to commercial and residential rentals.	Community Organizations

Focus Area 2 - Land Use and Green Space

The City of Harrisonburg aims to regulate and guide the use of land and green spaces to, among other things, promote positive social and environmental outcomes and promote the mindful use of resources. Green spaces can include undeveloped and developed lands that have natural and/or man-made green infrastructure made up of natural vegetation (ex. grass, trees, and other vegetation) and/or vegetative technologies. Green spaces can benefit the environment by filtering pollutants, providing shade and lowering temperatures in urban areas, and reducing erosion of soil into waterways. Four goals are included in this focus area.

Co-Benefits

Sound land use and green space planning can reduce public service infrastructure (such as transportation, stormwater facilities, and utilities) and service costs, improve watershed integrity and carbon sequestration, reduce car dependency and transportation costs, support wildlife habitat and ecosystem health, preserve rural and scenic landscapes, and reduce electricity used from air conditioning through increased shade cover from tree canopy. Sound land use and green space planning can also promote mental and physical health by providing psychological relaxation and stress alleviation, support physical activity, and promote social interaction.

Goal 1 – Modernize and Establish Enduring Land Use and Development Patterns

The way a city plans for new development, redevelopment, and infill development including the location and distribution of different land uses, buildings, housing, transportation facilities, utilities, and green space resources can have a tremendous effect on the day-to-day quality of life of its community members. For example, where and how development occurs contributes to the achievement of environmental and sustainability goals by reducing the overall energy use of residents within buildings and transportation, promoting social interactions and healthy lifestyles, and reducing costs, including but not limited to construction and maintenance of public service infrastructure and private infrastructure, utilities, and health care.

Where Are We Now?

The City of Harrisonburg regulates land use and development patterns through its Zoning Ordinance, Subdivision Ordinance, and Design and Construction Standards Manual (DCSM).

Initiative	Summary	Status
Update Comprehensive Plan[20]	The City's Planning Commission, with staff support, developed the 2018 Comprehensive Plan, which was adopted by City Council on November 13, 2018. Comprehensive Plans are reviewed once every five years during which a determination is made whether updates are desired.	Complete for 2018, Ongoing
Comprehensive Update of the Zoning[21] and Subdivision[22] Ordinances	This task has been initiated by the Department of Planning & Community Development. As of late-2019, city staff is preparing a request for proposals (RFP) for consultant support for this project. This project is anticipated to take two to three years to complete.	In-progress
Update the Design and Construction Standards Manual (DCSM)[23]	The DCSM provides design and construction standards for projects within the City of Harrisonburg. The DCSM is amended as needed in coordination with new or amended regulations.	Ongoing

Strategy 1.1 – Continue to Evaluate the Zoning Ordinance and Subdivision Ordinance and Make Updates as Needed

The Zoning Ordinance and Subdivision Ordinance regulate how land is used and how land is developed. These ordinances are the primary tools in implementing the vision, goals, and objectives of the Comprehensive Plan and other city plans. Failure to keep the ordinances up to date and relevant can unintentionally prohibit the implementation of city plans.

Task	Responsible Party
Continue Comprehensive Update the Zoning and Subdivision Ordinances project.	Community Development
Continue to Review the Zoning and Subdivision Ordinances at least once annually and amend, as needed.	Community Development

Strategy 1.2 - Continue to Coordinate Land Use Planning and Regulations with Transportation Planning

Refer to chapter on Sustainable Transportation.

[20] https://www.harrisonburgva.gov/comprehensive-plan
[21] https://www.harrisonburgva.gov/zoning
[22] https://www.harrisonburgva.gov/subdividing-property
[23] https://www.harrisonburgva.gov/dcsm

Strategy 1.3 – Continue to Promote High Density, Compact, and Mixed Use Development, Where Appropriate

High density, compact, and mixed use development, as opposed to low density, car-dependent, suburban sprawl, can help make communities more sustainable, economical, and healthy. High density and mixed use neighborhoods that are designed well with a mixture of housing types (single-family detached, duplex, townhomes, and apartments) located among public transit routes, jobs, schools, shops, services, green space, and walking and biking facilities can encourage behaviors that contribute to reducing traffic congestion and vehicle emissions, and can provide opportunities for more social interactions. This type of planning and development is encouraged within selected areas of the City identified in the Comprehensive Plan's Land Use Guide as "Mixed Use".

Task	Responsible Party
Develop Small Area Plans for areas designated in the Comprehensive Plan's Land Use Guide as "Mixed Use Areas." Small Area Plans may be concentrated along a transportation corridor and around a center to create "healthy connected neighborhoods" that would offer safe convenient access to goods, services, and jobs reachable on foot, bicycle, and public transit. Community members within these areas would be consulted to address needs and desires that are specific to the neighborhood.	Community Development, Public Works, HDPT
Continue to comprehensively update the Zoning and Subdivision Ordinances. This task should include review of the ordinances for their support of recommended residential densities and land development patterns described in the Comprehensive Plan.	Community Development

Goal 2 – Maintain and Create a Well-Distributed and Accessible Parks and Recreation System

The Department of Parks and Recreation maintains 11 city parks with a variety of green spaces including, but not limited to, a golf course, soccer and ball fields, shared use paths and trails, wooded and forested lands, and properties with water features such as ponds and streams.

Where Are We Now?

Initiative	Summary	Status
Comprehensive Recreation and Parks Master Plan[24]	Harrisonburg Parks and Recreation completed a public survey that helped to gather data to reveal many patterns and needs. This plan was last updated in 2013. Plan can be amended or updated as needed.	Completed
Smithland Road Park Master Plan[25]	This 175-acre park has four full sized soccer fields, natural surface trails, comfort stations, and a pavilion. This plan was created in 2004. Plan can be amended or updated as needed.	Completed
Ramblewood Park Master Plan[26]	This 60-acre park has softball fields, a press box, restrooms, and maintenance building. This plan was created in 2012. Plan can be amended or updated as needed.	Completed
Purcell Park Master Plan	This 67-acre park has three softball/baseball fields, four tennis courts, a playground, three picnic shelters, several restrooms, a 1.5-mile walking trail, and has a portion of the Bluestone Trail running through it. Plan can be amended or updated as needed.	In-progress

Strategy 2.1 - Continue to Update the Comprehensive Recreation and Parks Master Plan and Associated Park Plans

Task	Responsible Party
Update the Comprehensive Recreation and Parks Master Plan.	Parks and Recreation
Complete the Purcell Park Master Plan.	Parks and Recreation
Participate in the planning process by attending meetings (public open houses, public meetings, etc.) and providing input on the Comprehensive Recreation and Parks Master Plan.	Community Organizations

[24] https://www.harrisonburgva.gov/parks-plan

[25] https://www.harrisonburgva.gov/sites/default/files/Parks/files/smithland_road_park_mp_rev_9-7-04.pdf

[26] https://www.harrisonburgva.gov/sites/default/files/Parks/files/Ramblewood%20Park%20Master%20Plan%20Report-Final.pdf

Strategy 2.2 - Continue to Expand Sidewalks, Shared Use Path, and Trail Facilities to Connect People to Places They Want to Go, Including Private and Public Green Spaces

Task	Responsible Party
Continue to implement projects such as the Northend Greenway[27] and identify opportunities to construct new shared use path and trail opportunities as described in the City's Bicycle and Pedestrian Plan.[28]	Public Works
Continue to require new private developments to dedicate easements to the City and to construct shared use paths identified in the City's Bicycle and Pedestrian Plan.	Public Works, Community Development
Review the City's Subdivision Ordinance and Design and Construction Standards Manual (DCSM) and amend as needed to support the implementation of sidewalks, shared use paths, and trail facilities planned for in the City's Bicycle and Pedestrian Plan.	Public Works, Community Development

Goal 3 – Maintain and Increase a Healthy Tree Canopy

Trees provide many ecological benefits, such as improved nutrient cycling, carbon sequestration, provision of habitat for birds and other animals, improved stormwater management, and improved atmospheric quality. Trees also provide oxygen, improve health for residents, provide recreational space, and provide shade and beautification.

Where Are We Now?

Harrisonburg staff develops and maintains critical riparian buffers/no-mow zones on city property located along waterways to reduce erosion, reduce nutrient runoff, and increase canopy coverage. The City also maintains Tree City USA status. Tree City USA is a national program that requires participating cities to spend $2 per capita on associated tree work (in 2018 Harrisonburg spent $11 per capita). It also requires participants to have a tree care ordinance that establishes a tree board and policy for planting, maintaining, and removing trees from streets, parks, and public spaces, to hold an Arbor Day event, and to plant trees.

[27] https://www.harrisonburgva.gov/northend-greenway
[28] https://www.harrisonburgva.gov/bicycle-pedestrian-plan

Initiative	Summary	Status
Tree City USA[29]	This nationwide program helps promote urban tree canopy and improves care of these vital trees. The City has been a member since 2005.	Ongoing
Update and amend Title 9 Chapter 6 Public Tree Ordinance and Amend the Existing Public Tree Policy Document	Initiated in 2017, this project is a collaboration of multiple City Departments to comprehensively amend and modernize the City's Public Tree Ordinance and existing Public Tree Policy document. The result could combine the principles of both documents into a modern Public Tree Ordinance. It will define responsibilities of the public and City departments and create a unified approach on enforcing regulations associated with trees within the public street right-of-way and how to properly maintain the trees.	In-progress
Tree Canopy Study[30]	The Green Infrastructure Center (GIC) helps local government and communities to evaluate their green infrastructure assets and make plans to conserve them. This project began in 2016 and was completed in early 2019.	Completed
Purcell Park Tree Inventory	In 2017, James Madison University graduate students completed a complete tree inventory of Purcell Park.	Completed
Urban Forestry Management Program[31]	Initiated by city staff, this project began in 2017. A list of ongoing achievements is being documented.	Ongoing
Urban Wood Utilization Program	A program sponsored by the Virginia Department of Forestry to encourage local governments to utilize urban waste wood. The City has participated in this program since 2017.	Ongoing
Park Maintenance Management Plan	A plan that clearly defines the requirements and actions of the Parks Maintenance Division to maintain all parks, green spaces and assets to a high standard. Initiated in 2017.	In-progress
Emerald Ash Borer Treatment and Monitoring Program	A cost share program by the Virginia Department of Forestry helped treat 36 large ash trees in three different park locations. A monitoring program has been established to monitor the risk of untreated ash trees. The City began participating in this program in 2018.	Ongoing

[29] https://www.arborday.org/programs/treecityusa/treecities.cfm?chosenstate=Virginia

[30] https://www.harrisonburgva.gov/sites/default/files/PublicWorks/files/stormwater/1.13%20Harrisonburg_web_spreads%20%28002%29.pdf

[31] https://www.harrisonburgva.gov/urban-forestry-program

Strategy 3.1 - Develop and Implement an Urban Forest Management Program for Public Right-of-Ways and Public Properties

A comprehensive urban forest management program will assist in evaluating citywide public tree health, particularly in the age of the Emerald Ash Borer. The program will include tools to determine where species diversity is needed and what maintenance challenges can be foreseen in upcoming years.

Task	Responsible Party
Develop an Urban Forest Management Plan.	Public Works, Parks and Recreation
Consider creating an Urban Forester position.	Public Works, Parks and Recreation
Evaluate developing a tree inventory. Cost will depend upon staff and volunteer resources available and the scope of work.	Public Works, Parks and Recreation
Consider completing a tree risk assessment on all public trees.	Public Works, Parks and Recreation

Strategy 3.2 - Continue to Educate the Public on Tree Species and Tree Maintenance

To encourage expansion of tree canopy coverage within the City, private property owners need to be engaged. Private property owners should be encouraged to plant native trees that best suit their site. Private property owners should know the best management practices associated with tree maintenance, to maximize tree health and value.

Task	Responsible Party
Continue to offer percentage credits (opportunities for reducing fees) for tree plantings through the storm water utility program.	Public Works
Engage the community through social media, promoting tree plantings and site considerations.	Public Works, Parks and Recreation
Create a city staff contact for tree-related questions on the city website.	Public Works, Parks and Recreation

Goal 4 - Evaluate Opportunities for Underutilized Public and Private Lands and Consider Opportunities to Rehabilitate and Create New Natural Habitats

The purpose of habitat rehabilitation is to preserve, expand, and manage networks of natural habitat corridors, green spaces, and forested areas, which preserve and enhance the City's natural environment for future generations to enjoy.

Where Are We Now?

Initiative	Summary	Status
Parks Pollinator Enhancement Program	Since 2018, six new pollinator gardens have been installed, and other landscapes have been redesigned with perennial plants.	Ongoing

Strategy 4.1 - Continue to Enhance Pollinator Habitats and Multifunctional Perennial Plantings

Managing turf grass throughout the landscape on public property requires significant management such as mowing. There are many areas where managing for turf grass is unnecessary and costly. These areas should be considered for conversion to planned, intentional, and maintained wildflower meadows or food forest systems that maximize pollinator habitat provide other functions and benefits to the environment and the community. Pollinator habitats and multifunctional perennial plantings, such as food forests, can directly reduce carbon emissions, maintenance cost, and time from city staff who would otherwise mow grassy areas. Perennial systems can also provide other benefits including, but not limited to, reducing stormwater pollution, increasing genetic diversity, providing food for humans and wildlife, providing habitat for wildlife, providing windbreaks or shade, and improving aesthetics of these sites.

Task	Responsible Party
Continue to pursue programs which enhance wildlife habitat and environmental sustainability.	Parks and Recreation, Public Works
Create a pollinator habitat planting and maintenance plan.	Parks and Recreation, Public Works
Review existing Zoning Ordinance to ensure that support for advancement of food forest initiatives is possible.	Community Development
See related tasks in Strategy 3.2 within this Focus Area.	

Strategy 4.2 - Enhance Riparian Buffers

Riparian buffers provide critical services to improving water quality. Riparian buffers also create and enhance pollinator habitat, tree canopy coverage, and connectivity of an urban forest.

The City should create new riparian buffers on all public property, where waterways or streams are present and should encourage private property owners of stream front property to establish riparian buffers.

Task	Responsible Party
Develop and implement a riparian buffer maintenance plan, including information about what to plant and where, for all city properties.	Public Works
Educate and encourage private property owners to establish riparian buffers in vacant and underutilized portions of property. Many of these areas are within the floodplain where development may be difficult or costly.	Public Works, Community Organizations, Private property owners

Focus Area 3 - Regional Food Systems

A food system is generally understood to be the chain of activities connecting food production, processing, distribution, consumption, and waste management. Every day we make dozens of choices about what we eat, what we buy, how we use or consume these items, and how we dispose of them at the end of their useful life.

Food system activities take up a substantial amount of urban and regional land and represent important parts of community and regional economies. The environmental impacts of industrial farming practices and food waste as well as the energy and resources consumed by growing, harvesting, processing, and transporting our food are significant. Agriculture consumes about 40 percent of global land, while food production contributes to about 30 percent of global greenhouse gas emissions. Changes in food production practices could cut agricultural greenhouse gas emissions by 10 percent in 2050, and wide adoption of plant-based diets could further reduce agricultural emissions by up to 80 percent.[32]

On average, U.S. household food consumption emits 8.1 metric tons of carbon dioxide each year. The production of food accounts for 83% of emissions, while its transportation accounts for 11%.[33] Two goals are included in this focus area.

Co-Benefits

A healthy, sustainable food system conserves, protects, and regenerates natural resources, landscapes, and biodiversity; meets current food and nutritional needs without compromising the ability of the system to meet the needs of future generations; thrives in the face of challenges such as unpredictable climate, increased pest resistance, and limited water and energy supplies; supports the physical and mental health of all farmers, workers, and consumers; appreciates and supports the diversity of cultures, socio-demographics and lifestyles; and considers all parts of the food system from production, processing, packaging, distribution, consumption and management of wastes.

[32] "Food in the Anthropene: the EAT-Lancet Commission on healthy diets from sustainable food systems.", published: January 16, 2019, https://www.thelancet.com/commissions/EAT

[33] http://css.umich.edu/factsheets/carbon-footprint-factsheet

Goal 1 - Promote Accessibility to Local, Healthy, and Sustainably Produced Food

Local food is grown close to where it is bought and consumed. Buying from local sources not only reduces fossil fuel used and greenhouse gases emitted from transportation, it also supports the local economy. Local and seasonal foods can be healthier to consume and more nutritionally dense because fruits and vegetables can be grown closer to full ripeness before harvesting. Additionally, because nutrients degrade after harvest, local food that is fresh from the field and that has not traveled for days is more nutritious.

However, sustainably produced food can have a lower impact on the environment by being produced in a socially responsible manner even though it is not always local. Sustainability aims to support buying food as local as possible, but just because it's local does not always mean it's produced sustainably. Food produced sustainably may protect biodiversity, wildlife habitats, and water resources. Additionally, sustainably produced foods respect workers and encourages members of our community to know where their food is grown and by whom and allows community members to be grounded with the land where they reside.

Where Are We Now?

Initiative	Summary	Status
Business Loan Program[34]	The Harrisonburg Department of Economic Development provides up to $25,000 to encourage small business development and expansion. This program is available to food related businesses.	Ongoing

Strategy 1.1 - Support and Promote Opportunities for Community Gardens and Urban Agriculture

At one time and throughout the country, the creation of community gardens and farming was not viewed as an urban activity. However, this perception is changing as individuals and communities have realized the broad-reaching benefits of community gardens as quasi "community centers" and meeting spaces. Agricultural programming is now seen as providing opportunities for education, personal health and development, active living, community cohesion and pride, economic improvement, and increased livability of a community.

At the time of this writing, community gardens as principal uses, such as on a vacant piece of property, are not allowed in the City of Harrisonburg. In order to increase the opportunities for urban agriculture in the City of Harrisonburg, amendments to the City's Zoning Ordinance[35] would need to be made to allow community gardens as principal uses. Once the Zoning Ordinance is amended, community organizations and neighborhoods can create new or expand existing community garden programs on vacant parcels.

[34] https://www.harrisonburgva.gov/business-loan-program
[35] https://www.harrisonburgva.gov/zoning

Task	Responsible Party
Amend the Zoning Ordinance to create a community garden use definition and regulations to allow them as a principal use.	Community Development
Conduct a vacant parcel and land use audit to identify potential locations for community garden spaces based on proximity to food equity zones and encourage private property owners to repurpose appropriate vacant lots for commercial and noncommercial urban agriculture (Note: requires property owner permission.)	Community Organizations
Where practicable and desirable to the community, address policy barriers that hinder local production of food including neighborhood restrictions on gardening, food processing, and keeping small livestock such as chickens. Restrictions include: Neighborhood restrictions from Homeowners Associations, Land use regulations from Community Development, and food processing regulations from the Virginia Department of Health and Virginia Department of Agriculture	Community Organizations
Develop educational program to demonstrate and teach community gardening in an urban setting and encourage sharing and learning about culturally diverse methods of agriculture.	Community Organizations
Promote business gardens. Business gardens are allowed by the Zoning Ordinance as a home occupation, an accessory use to the principal residential use on a property. Individuals residing at the property can cultivate fruits, vegetables, herbs and flowers and sell products off-site.[36] (Requires a home occupation permit from Community Development.)	Community Organizations

[36] https://www.harrisonburgva.gov/home-occupation-permit

Strategy 1.2 – Support and Improve Access for Neighborhoods and People with Poor Access to Fresh, Local, and Sustainably Produced Foods

To increase opportunities for low-income people to purchase less-processed and lower-carbon foods, this strategy aims to expand farmers markets, food buying clubs and cooperatives, and community supported agriculture programs that participate in the Supplemental Nutrition Assistance Program (SNAP).

Task	Responsible Party
Conduct an assessment of distances and access to grocery stores and target community engagement in neighborhoods identified in the Harrisonburg EATs study.[37]	Community Organizations
Encourage mixed-use and traditional neighborhood development and redevelopment (in areas recommended by the Comprehensive Plan) to include small and mid-sized grocery stores (e.g. 3,000 to 20,000 square feet), seasonal farmers markets, and spaces for community members to grow their own food.	Community Organizations, Community Development
Improve sidewalk connectivity, bike facilities, and availability of public transit from residential neighborhoods to grocery stores, farmers markets, and open spaces described above.	Public Works, HDPT
Expand current loan opportunities to allow organizations to establish and support mobile markets, community kitchens, and food hubs.	Community Organizations, Harrisonburg Economic Development
Promote the availability of food (fresh, value added, processed, etc.) that reflects the needs of our ethnic and cultural communities.	Community Organizations
Promote knowledge of where Supplemental Nutrition Assistance Program[38] (SNAP) and Special Supplemental Nutrition Program for Women, Infants and Children (WIC)[39] benefits can be used to purchase local foods, such as by creating handouts for SNAP/WIC recipients with a map showing locations where SNAP is accepted.	Community Organizations
Continue to operate the Harrisonburg Farmers Market to provide the public with access to fresh, nutritious, locally produced foods.	Harrisonburg Farmers Market Association Board
Research viability of additional locations for farmers markets (permanent locations or mobile markets) within the City. If viable, identify locations for farmers markets within the City that expands access.	Community Organizations
Continue to support and improve access to farmers markets and community support agriculture (CSAs).	Community Organizations

[37] Bendfeldt, Eric S. and B. Schermerhorn. "Everyone at the Table: A community food equity assessment of Harrisonburg, VA." Virginia Cooperative Extension. 2017. https://vtechworks.lib.vt.edu/handle/10919/81521

[38] https://www.fns.usda.gov/snap/supplemental-nutrition-assistance-program

[39] https://www.fns.usda.gov/wic

Goal 2 - Support Sustainable Food Production, Selection, Distribution, and Disposal Practices

A sustainable food system accounts for the impacts across the entire lifecycle of how food is produced, processed, packaged, labeled, distributed, marketed, consumed, and disposed. Additionally, a sustainable food system conserves, protects, and regenerates natural resources, landscapes, and biodiversity; meets our current food and nutrition needs without compromising the ability of the system to meet the needs of future generations; supports the physical and mental health of all farmers, workers, and eaters; and thrives in the face of challenges, such as unpredictable climate, increased pest resistance, and limited water and energy supplies.[40]

Where Are We Now?

Initiative	Summary	Status
Food composting drop off at City Hall.[41]	In 2017, the City made a location available near City Hall and the Turner Pavilion (Farmers Market Pavilion) available to the Climate Action Alliance of the Valley (CAAV) for the collection of compostable materials. CAAV runs this program with the support of public donations.	Ongoing

Strategy 2.1 - Promote Sustainable Urban Agriculture and Food Production Practices

This strategy is focused on urban agriculture and food production efforts within city limits. Environmental sustainability in agriculture means good stewardship of the natural systems and resources that gardens and lands rely on. Among other things, this involves building and maintaining healthy soil, managing water wisely, minimizing air, water, and climate pollution, and promoting biodiversity.

Task	Responsible Party
See related tasks in Strategy 1.1 within this Focus Area.	
Educate urban gardeners on sustainable agricultural practices including, but not limited to, rotating crops and embracing diversity, planting cover crops during off-season times when soils might otherwise be left bare, reducing or eliminating tillage, using low-carbon agricultural equipment or techniques, and applying integrated pest management (IPM) to control pest pollutions while minimizing the use of chemical pesticides.	Community Organizations
Educate and encourage the management of multifunctioning landscapes, such as food forests, which provide community members with local fruits and nuts while also providing several ecosystem services. See related chapter on Land Use and Green Space.	Community Organizations

[40] Adapted from "Principles of a Healthy, Sustainable Food System" by the Academy of Nutrition and Dietetics, American Nurses Association, American Planning Association, and American Public Health Association. https://www.planning.org/nationalcenters/health/foodprinciples.htm

[41] https://climateactionallianceofthevalley.org/composting/

Focus Area 4 - Sustainable Transportation

The City of Harrisonburg seeks to develop and maintain a safe and convenient transportation system serving all modes of travel, including driving, walking, biking, public transportation, ridesharing, and future technologies that serve the transportation needs of the community. The primary environmental benefit of sustainable transportation is the reduction of pollutants, such as greenhouse gases, which are released into the atmosphere. Public infrastructure has been developed to serve primarily gasoline and diesel single occupancy vehicles and truck freight for many decades. In the future, electric vehicles will become more common. Transportation will still rely on the provision of public infrastructure but is expected to shift to a service provided to individuals by vendors/private entities, as opposed to individuals providing it for themselves using single occupancy vehicles of their own.

Since Harrisonburg is an urban center in an otherwise rural region, and the shift in transportation service is likely to be more pronounced in urban areas, the City's transportation network must continue to serve single occupancy vehicles for the foreseeable future, while adapting infrastructure to meet the travel modes of the future. Adapting to meet the needs of the future also includes increasing infrastructure for non-motorized modes and may include the prioritization of modes and vehicle types in various areas of the City, as it makes sense to do so for efficiency and safety. Seven goals are included in this focus area.

Co-Benefits

The Co-benefits of a sustainable transportation include cleaner air, reduced infrastructure needs/costs resulting from less congestion and less demand for parking, increased access to jobs, education, and other daily needs, increased safety and health due to cleaner air, ability to safely replace some vehicle trips with active transportation which are opportunities for physical activity and increased in interaction between people. Economic development may also be a benefit of sustainable transportation, as companies include active transportation availability as a quality of life indicator that their employees desire and expect.

Goal 1 - Develop an Alternative Fuel Fleet Program

An alternative fuel fleet program would include using electric buses as a part of Harrisonburg Department of Public Transportation's (HDPT) fleet.

Strategy 1.1 - Evaluate the Viability of an Electric City Fleet

Determine the viability and use of electric buses in HDPT's fleet within the next five years.

Task	Responsible Party
Continue evaluating the viability/use of electric buses and fleet vehicles in HDPT's fleet within the next five years.	HDPT
Consider developing and implementing the infrastructure and service needs for the operation of electric vehicles.	HDPT
Consider reviewing maintenance and service contracts from localities already implementing electric buses to create a maintenance and repair policy for alternative fuel vehicles.	HDPT

Goal 2 - Implement Sustainability Practices into Municipal Fleet Management

Fleet Management strives to uphold a sustainable fleet and uses sustainability practices when servicing, repairing and replacing its vehicles and equipment. Fleet Management also applies sustainability practices whenever possible in their day-to-day operations and procedures. Performing sustainable practices means reducing the overall environmental impact from fleet operations. This is achieved by measuring, analyzing and collecting data to save electricity, improve air quality through emission reduction, increasing fuel efficiency, and reducing fuel consumption.

Where Are We Now?

Initiative	Summary	Status
Vehicle Replacement Program	Replacement of out of service vehicles/equipment with newer, more fuel- efficient vehicles/equipment	Ongoing
Vehicle Maintenance	Modern vehicle/equipment lifts are purchased to replace old units. Used oil is recycled to heat the maintenance facility.	Ongoing
"No Idling" Policy	Timers on buses shut buses off after ten minutes of idle time.	Ongoing
Engine block heaters	The use of timed, engine block heaters during cold weather saves energy and reduces idle time, resulting in less fuel consumption.	Ongoing

Strategy 2.1 - Continue the Vehicle Maintenance and Replacement Program

Regular maintenance and inspections greatly reduce major breakdowns and increase fuel efficiency. When vehicles reach the end of their useful service life, they will be replaced with newer, more fuel-efficient vehicles.

Task	Responsible Party
Continue to implement the Flagship Fleet Management system (software), which allows HDPT to efficiently analyze data collected from each vehicle and track maintenance and inspections.	HDPT
Consider replacing out of service vehicles with cleaner burning diesels, lower emission producing gas and diesel engines, and some hybrid vehicles.	HDPT

Strategy 2.2 - Continue Environmentally Friendly Vehicle Maintenance

Task	Responsible Party
Consider purchasing modern vehicle/equipment lifts that are self-contained units. This prevents old seals from leaking oil into the ground. New units are low-voltage to save energy, and some have rechargeable batteries.	HDPT
Continue to recycle used oil and petroleum-based fluids. Oil filters are crushed to extract the maximum amount of oil, which is then used in the clean burn heating system to heat the maintenance facility.	HDPT
Consider alternative sources of heat for the maintenance facility if using recycled oil becomes less environmentally-friendly of fuel source when compared to other options.	HDPT

Goal 3 - Increase Public Transit Ridership

Increasing public transit ridership through efficient and convenient routes means reducing the number of cars driven throughout Harrisonburg.

Where Are We Now?

Initiative	Summary	Status
Route Study/Analysis	A Route Study/Analysis for James Madison University (JMU) and associated city routes that serve JMU was started in January 2019. Recommendations will be made, and alternative routes proposed.	Ongoing

Strategy 3.1 - Continue to Develop Programs to Increase HDPT Ridership (Outreach)

JMU Outreach program to increase JMU ridership.

Task	Responsible Party
Continue partnering with JMU on policies and procedures to increase ridership.	HDPT
Continue to use Social Media (Twitter, Snapchat, Facebook, giveaways).	HDPT
Consider giving presentations to incoming Freshmen, Senior Citizens, Refugees, and city Residents.	HDPT
Evaluate effectiveness of outreach methods.	HDPT
Continue developing and implementing new methods of outreach to increase effectiveness.	HDPT

Strategy 3.2 - Continue to Improve Bus Stop Connectivity (¼ Mile Improvements)

Task	Responsible Party
Continue to work with developers during site plan review and collaborate with Public Works where possible to locate benches and shelters during projects.	HDPT

Strategy 3.3 - Develop a Program to Routinely Review Bus Routes, Stop Locations, and Frequency.

It is important to closely monitor ridership usage of bus stops. This can help determine if routes are performing optimally for the greatest ridership potential. Engaging with passengers and residents is vital to determine if additional stops would increase ridership. Also, alterations of routes to remove unused stops could help improve on-time performance of routes.

Task	Responsible Party
Complete the Route Study/Analysis for transit routes related to JMU, with analysis of extended service hours for City transit routes. The study should look at ways to increase ridership for studied routes.	HDPT
Implement recommendations of the Route Study/Analysis as financial support and staffing needs are available.	HDPT
Consider analyzing bus stop usage data and determine potential new stops.	HDPT
Consider developing bi-annual bus stop poll/survey requests and administer to residents.	HDPT
Consider analyzing bus routes for increased duration and decreased headways based on City conducted capacity analysis.	HDPT

Goal 4 - Traffic Signal Optimization and Timing Improvements

Signal timing optimization means efficient flow of traffic, less delay, fewer vehicle stops, safer driving, better accommodate different transportation modes and higher capacity of existing street network. The City has different strategies to achieve its goal of traffic signal timing optimization by invest in human resources, use of technology and seeking federal/state funds to keep the system updated.

Where Are We Now?

Initiative	Summary	Status
Traffic Signal Maintenance	The Public Works Department currently maintains 86 traffic signals. The system infrastructure is well established with relatively advance detection and communication technology.	Ongoing
Traffic Management Center (TMC)	The Public Works Department for the first-time opened its Traffic Management Center (TMC) in 2012, where most of traffic signals and traffic surveillance cameras connected to the traffic control room at public works. Since then, operational management significantly improved, as the system provides real time status of signals, informs users of any faults and allows remote access to signal controllers.	Complete
Traffic Signal Optimization	Through TMC timing plan updates become easier to implement, however, due to lack of enough staff to collect and analyze data some of corridor timing plans not frequently updated as City aimed for.	Ongoing

Strategy 4.1 - Continue Improving In-House Timing Plan Update Capability

Data collection and analysis is time consuming and costly as far as human power and data collection tools, but it is essential to have capability in-house because daily traffic management needs continuous monitoring and evaluation. The ability to collect and analyze high resolution data allows the City to optimize the street network and actively respond to traffic pattern changes. Investment in human resources, as well as technology will allow the City to provide the traffic management level of service expected by the community.

In the last decade significant changes have occurred in the Intelligent Transportation System (ITS) industry, in general, and in traffic signal optimization. New detection technology can collect turn movement counts and other performance measures, along with vehicle detection and reporting it to the Traffic Management Center. Such technology can reduce the need for human resources and data collection tools at locations where it is installed. The City already has this new technology installed in multiple locations, and benefits from the efficiencies it provides. Another emerging technology is the Adaptive Traffic Control Systems (ATCS) that continuously adjusts timing plans using detection systems where traffic patterns are less predictable and major street traffic flow is a high priority. The City's strategy at this point is to keep observing developing technology and study opportunities where they can be most effective.

Task	Responsible Party
Continue to expand new detection system with turning movement count capability.	Public Works
Consider exploring ATCS systems and study locations where the system can be most effective.	Public Works

Strategy 4.2 - Continue to Optimize Signal Operations

Day to day operations and minor adjustments of signal timing for some corridors is most effectively done in-house by city staff. However citywide timing plan updates on major corridors takes more staff resources than are available. Such updates are only recommended every three years, but the City has not kept pace with this schedule due to lack of staff resources. Optimizing signal operations, particularly on major corridors, reduces vehicle stopping time, and therefore, vehicle idling. Reducing idling reduces vehicle emissions.

Task	Responsible Party
Consider developing a sustainable funding source for optimization of major corridor signal timing plans to be performed by consultants.	Public Works

Goal 5 - Support Alternative, Active, and Low-Carbon Forms of Transportation and Improved Fuel Efficiency

Bicycling and walking are largely a function of land use, where a mix of uses, and relatively higher density, combined with the presence of bicycle and pedestrian infrastructure and lower speed limits support bicycling and walking. Land uses and the transportation network supporting them become increasingly suburban the further from downtown and from JMU one travels, and the transportation network becomes more suburban (low density, single use land uses, and high-volume roads, higher speed limits, and often inadequate bicycle and pedestrian infrastructure). Most new development lacks elements of traditional neighborhood design that supports bicycling and walking.

Where Are We Now?

Initiative	Summary	Status
Community Support	Bicycling and walking are prevalent forms of transportation downtown and on JMU's campus. There is also a strong desire in the community for children to be able to walk to school.	Ongoing
Bicycle and Pedestrian Plan[42]	The City adopted an updated Bicycle and Pedestrian Plan in 2017 and applies for funding every year to implement the projects identified.	Completed for 2017, Ongoing
Development Regulations[43]	Local regulations require developers to build bicycle and pedestrian infrastructure with new developments and redevelopment. Development regulations can be reviewed for amendments.	Ongoing
Permitting Process for Shared Mobility Devices (SMD)	In February 2019, City Council adopted a permitting process for SMDs to allow commercial rentals of SMDs while providing certain safeguards. The demonstration project would last one year, with the option to extend the project. SMDs include scooters and bicycles.	Completed

[42] https://www.harrisonburgva.gov/bicycle-pedestrian-plan
[43] https://www.harrisonburgva.gov/dcsm, https://www.harrisonburgva.gov/subdividing-property

Strategy 5.1 - Adopt Policies and Standards that Support Alternative Modes of Transportation

Standards and policies will guide new development and infrastructure to promote the use of alternative modes of transportation.

Task	Responsible Party
Consider the development of a Complete Streets policy and incorporate changes into associated design and construction standards. Support the prioritization of alternative modes where appropriate, such as more urban and neighborhood centers.	Public Works, City Council
Consider revising off-street parking requirements of the Zoning Ordinance to include a maximum number of parking spaces, instead of a minimum. Less parking availability will give rise to thought about travel modes.	Community Development
Support mixed use and higher density development in appropriate locations. Mixed use and higher density development support walkability.	Community Development, Planning Commission, City Council
Promote interparcel connectivity with development to build parallel routes of travel, distributing traffic and increasing connectivity, to reduce vehicle miles traveled, and create lower stress routes for biking and walking.	Community Development, Public Works

Strategy 5.2 - Continue Implementation of the Bicycle and Pedestrian Plan

The Bicycle and Pedestrian Plan promotes the development and maintenance of a network of streets and paths that are designed and operated to enable safe access for all users, including pedestrians, bicyclists, motorists, and transit riders of all ages and promotes the use of education and encouragement to promote safe walking and bicycling as a form of transportation and recreation. The plan includes recommendations for retrofitting existing development to add bicycle and pedestrian connectivity, adding safe and comfortable facilities to make biking and walking viable alternative modes of travel. The Plan is reviewed every five years.

Task	Responsible Party
Implement the infrastructure recommendations of the Bicycle and Pedestrian Plan.	Public Works
Make bicycle and pedestrian comfort a priority in infrastructure design.	Public Works
Continue local funding to support increased implementation of the Bicycle and Pedestrian Plan.	Public Works, City Manager, City Council
Continue to seek state and federal grant funds for biking and walking infrastructure projects.	Public Works
Continue to support education and encouragement programs to promote active transportation. This can include a city bicycle map, bike lights, public events, etc.	Community Organizations
Review the Bicycle and Pedestrian Plan every 5 years and update the plan as needed to include additional strategies and projects.	Public Works

Strategy 5.3 - Continue to Promote Interconnection Between All Modes of Transportation

Interconnection of modes will allow people to take longer trips by alternative modes and make transit more accessible.

Task	Responsible Party
Continue to include bus stop improvements on capital street projects.	Public Works
Beginning with the highest use bus stops, continue to fill sidewalk gaps within 1/4 mile.	Public Works
Continue to determine feasibility of improving bus stops with shelters where none currently exists, beginning with the highest use bus stops.	Public Works, HDPT
Continue to review bus stops for pedestrian safety treatments.	Public Works, HDPT
Continue to provide adequate parking for nonmotorized and alternative modes of transportation, including but not limited to bicycles, electric bicycles, electric scooters.	Public Works Community Development, Private Property Owners

Strategy 5.4 – Support Low-Carbon Modes of Transportation and Improved Vehicle Fuel Efficiency

Improving fuel efficiency of vehicles saves community members money and reduces pollution.

Task	Responsible Party
Support the implementation of improved federal fuel efficiency standards. City Council support could be done by resolution or other means to show support.	City Council, Community Organizations
Support the implementation of state and federal incentives for electric vehicles. City Council support could be done by resolution or other means to show support.	City Council, Community Organizations
Promote collaboration and coordination to expand the use of electric vehicles and the availability of electric charging stations throughout the region.	Community Organizations, Private Businesses

Goal 6 - Continue to Coordinate Land Use Planning and Regulations with Transportation Planning

Land uses affect the environment and depends on transportation and infrastructure in order to function. Land use planning relates to the physical environment where we live and work. Transportation connects us to all our activities, and it connects communities. The design of transportation facilities such as roads, driveway access points, sidewalks, and bike routes has an impact on our community's character. How we use our land impacts our transportation facilities and vice versa. Land use and transportation are mutually dependent and inseparable.

The impact of technological advances that impact transportation modes and choices should also be considered. For example, how do ridesharing (I.e. Uber, Lyft), dockless mobility devices (I.e. bicycles and scooters), GPS devices, and self-driving automobiles influence development patterns, parking requirements, etc., and how can city policies and regulations encourage more environmentally friendly choices?

Where Are We Now?

Initiative	Summary	Status
Comprehensive Plan[44]	The City's Planning Commission, with staff support, developed the 2018 Comprehensive Plan, which was adopted by City Council on November 13, 2018. Comprehensive Plans are reviewed once every five years during which a determination is made whether updates are desired.	Completed for 2018, Ongoing
Comprehensive Update of the Zoning and Subdivision Ordinances[45]	This task has been initiated by the Department of Planning & Community Development. As of early-2019, an evaluation of land use ordinances and regulations is currently underway.	Ongoing
Design and Construction Standards Manual (DCSM)[46]	The DCSM provides design and construction standards for projects within the City of Harrisonburg. The DCSM is amended as needed in coordination with new or amended regulations.	Ongoing

[44] https://www.harrisonburgva.gov/comprehensive-plan
[45] https://www.harrisonburgva.gov/zoning, https://www.harrisonburgva.gov/subdividing-property
[46] https://www.harrisonburgva.gov/dcsm

Strategy 6.1 - Identify Opportunities to Promote or Require Infrastructure to Support Alternative Transportation Modes

Task	Responsible Party
Review City ordinances and design standards to require and/or encourage property owners and developers to provide infrastructure to support alternative modes of transportation as part of development proposals.	Community Development, Public Works, HDPT
Consider establishing regulations and policies that promote ridesharing and dockless mobility devices. Promotion can include, but is not limited to, granting companies permission to operate in the city right-of-way and requiring or encouraging developers to provide ridesharing pull off areas or parking areas for dockless mobility devices.	City Attorney's Office, Community Development, Public Works
Consider developing City ordinances or policies to require or encourage installation of electric charging station within the private sector for new development and redevelopment. Create guidelines for installation.	Community Development, Community Organizations
Participate in the planning process by attending meetings (public open houses, public meetings, etc.) and providing input on city plans and projects.	Community Organizations, Individuals

Focus Area 5 - Waste Reduction and Recycling

The City of Harrisonburg seeks to determine a sustainable, long-term, and fiscally responsible refuse and recycling program that consistently supports and promotes the reduction of solid waste, the reuse of usable items, and the recycling of materials. Four goals are included in this focus area.

Co-Benefits

A sound waste management program results in cleaner streets, water quality, air quality, energy conservation, reduced habitat destruction from material extraction, and reduced greenhouse gas emissions. Food waste recovery can also increase food availability to vulnerable populations, provide local livestock feed, and increase local soil fertility through composting programs. Incentivizing reduced solid waste generated means savings in the cost of trash disposal fees for property owners and reduced operational costs and tipping fees for the City. These resources are then freed up for more productive uses.

Goal 1 - Support and Promote the Reduction of Refuse in Landfills

Landfills have limited space and have significant environmental impacts. The City of Harrisonburg will work on the following strategies to support and promote the reduction of refuse in landfills, specifically the local Rockingham County Landfill.

Where Are We Now?

The City of Harrisonburg's only program to support and promote the reduction of refuse in landfills is the recycling program The City also offers a webpage, "Alternatives for Unwanted Items," as a resource to the community.[47] The webpage helps to connect residents and businesses with other businesses and groups that can use items.

Strategy 1.1 - Establish a Pay-As-You-Throw System

Linking waste reduction to a fee structure is a powerful tool to reduce refuse generated. A Pay-As-You-Throw (PAYT) system is a usage-pricing model. Users are charged a rate based on the amount of waste they put out for collection. Implementing a curbside collection program utilizing this system would promote awareness of the volume of waste generated and parallel other metered utilities in the City.

Task	Responsible Party
Develop and implement a PAYT system. City Council would be responsible for approving a PAYT system. PAYT system would include ordinance changes made as described in Strategy 1.3.	Public Works, City Council

[47] https://www.harrisonburgva.gov/unwanted-items-alternatives

Strategy 1.2 - Create a Program that Recognizes or Incentivizes Businesses that Substantially Reduces Waste

Create a program that incentivizes businesses – including restaurants, hotels, events, and offices to reduce the usage of single-use products, paper, etc. This program may link to an existing program (ex: Virginia Green Travel) or may constitute development of a new program.

Task	Responsible Party
Identify entity to take on program development.	Private Businesses, Community Organizations
Develop and promote program.	Private Businesses, Community Organizations

Strategy 1.3 – Review City Solid Waste Ordinance

Ordinance changes could be made to limit the number of refuse containers allowed to be picked up. Currently, customers are able to have 5 containers or 5 bags - bags and containers cannot be over 75-lbs. and must have 35-gallon capacity each. Changes in the amount of refuse allowable for collection will promote lessening of waste generated. Changes in the bulk and yard debris program could also be evaluated.

Task	Responsible Party
Review the Solid Waste Ordinance and consider amending and implementing changes.	City Council, Public Works
If ordinance changes are made, educate the public about the changes.	Public Works

Strategy 1.4 – Consider Creating a Policy for Eco-friendly Purchases and Paperless Transactions

City operations should set an example to area businesses by limiting the purchase of single-use items. Standardization of purchasing procedures should be considered across city offices which will warrant the development of a citywide policy.

Task	Responsible Party
Consider developing, adopting and implementing an internal City policy.	City Manager's Office, Public Works, Purchasing

Goal 2 - Encourage and Promote Zero Waste and the Reuse of Usable Items

"Zero waste" is a set of principles focused on waste prevention that encourages the redesign of resource life cycles so that all products are reused. The goal is for no trash to be sent to landfills, incinerators, or other places for disposal.

Solid waste in Harrisonburg is disposed of at the Rockingham County landfill. Diverting material from the landfill through reuse lessens the tipping fee the City pays at the landfill and further reduces the environmental impacts of developing new products.

Where Are We Now?

Initiative	Summary	Status
Existing Reuse Programs	The City is able to consider reuse as a maximum of 2% of the 25% recycling requirement according to DEQ specifications. The City of Harrisonburg reuses milling material from pavement operations, leaves from curbside leaf pick-up, urban wood (where possible), yard debris, and glass. Many of these items are used as cover material at the Rockingham County Landfill and are not considered part of the regular waste stream entering the landfill.	Ongoing
Alternative for Unwanted Items webpage resource[48]	The City also offers a webpage, "Alternatives for Unwanted Items," as a resource to the community. The webpage helps to connect residents and businesses with other businesses and groups that can use items.	Ongoing
Support of Community Composting[49]	The City supports a local non-profit composting initiative by allowing containers to be placed on city owned property for users to drop-off their compostable material.	Ongoing

[48] https://www.harrisonburgva.gov/unwanted-items-alternatives
[49] https://climateactionallianceofthevalley.org/composting/

Strategy 2.1 – Encourage, Educate, and Promote Zero Waste Principles

Encourage and educate community members about zero waste principles.

Task	Responsible Party
Continue to develop the city webpage to aggregate reuse resources by identifying businesses, non-profits, artist groups, etc. that take once-used or leftover materials and advertise where and when the materials can be collected.[50]	Public Works
Develop "Zero Waste" lesson plans and presentations for different audiences. Examples might include lesson plans for Harrisonburg City Schools or presentations for professional or community organizations.	Community Organizations

Strategy 2.2 - Continue Thrift Store Sponsorship at Recycling Convenience Center

Stage donation bins at the Recycling Convenience Center for lightly used clothing, games, electronics, furniture, and building supplies. The sponsoring thrift store would pick-up donations on an as-needed basis. All profits would remain with the thrift store.

Task	Responsible Party
Continue to develop partnerships with local businesses to locate at the Recycling Convenience Center and develop an advertising program to educate citizens of these disposal options.	Private Business, Community Organization, Public Works

Strategy 2.3 - Lobby State to Subsidize Companies That Process Recyclable Material

Establishing a local and consistent market for recycling vendors to source recyclables is a crucial component of sustaining a recycling market. Without this avenue, the cost of shipping recyclable material becomes cost-prohibitive. It is important to encourage businesses that can use recyclables as raw material come to the area and for the state government to recognize this regional need.

Task	Responsible Party
Consider identifying feasible partnerships/siting of new businesses.	Economic Development
Partner with local government advocacy organizations (Virginia Municipal League, Virginia First Cities) to lobby the General Assembly for increased subsidies, grants, etc. for new equipment and local connections.	Private Businesses, Community Organizations, Individuals

[50] https://www.harrisonburgva.gov/recycling

Strategy 2.4 - Promote Composting Programs

Composting is a known method for removing reusable waste material from the waste stream. Many homeowners and restaurants already undergo composting efforts.

Task	Responsible Party
Continue cross-promoting, enhancing, and educating the public about composting efforts.	Public Works, Community Organizations, Private Businesses
Consider offering pre-fabricated urban composting containers for free or at a reduced cost to encourage residential backyard composting.	Community Organizations

Goal 3 - Support and Promote Recycling

The City of Harrisonburg is required by the Commonwealth of Virginia to meet a 25% recycling rate and submit annual reports to the Virginia Department of Environmental Quality outlining the means to reach this recycling rate.

Where Are We Now?

Initiative	Summary	Status
Recycling Convenience Center[51]	In March 2018, the City opened a Recycling Convenience Center at 2055 Beery Road in Harrisonburg, where citizens can drop off recyclables. These pre-sorted recyclables are uncontaminated or less contaminated, making them easier to market to local vendors/recycling organizations.	Ongoing
Recycling Mobile Unit[52]	Starting October 2018, a recycling mobile unit was placed at the Farmers Market during Farmers Market hours and is attended by a staff member to answer related questions and assist in properly sorting recyclables. Starting August 2018, a recycling mobile unit was placed at city sponsored events for use by event vendors and participants. Beginning in the Spring of 2019, a recycling mobile unit was placed a throughout the City on a rotating schedule.	Ongoing
Cardboard Pick-Up	Only businesses with a significant amount of cardboard are eligible for cardboard recycling pick-up. There is a truck dedicated for this purpose. Some areas are picked up regularly, and others are picked up once Public Works has been notified.	Ongoing

[51] https://www.harrisonburgva.gov/recycling
[52] https://www.harrisonburgva.gov/recycling

Strategy 3.1 - Continue to Monitor Opportunities for Providing Expanded Recycling Options

The Recycling Convenience Center currently only offers recycling options when local vendors have been identified. Expanded options would allow for the public to bring more items to the Recycling Convenience Center to be properly diverted from the landfill.

Task	Responsible Party
Identify and consider partnering with existing recycling programs within city limits.	Public Works
Identify larger recycling program not within city limits and consider partnership opportunities.	Public Works

Strategy 3.2 - Continue to Evaluate Ways to Enhance and Promote Local Recycling Initiatives

The Recycling Convenience Center and the mobile center available on Saturdays when the Farmers Market is operating do not address all areas where local recycling could take place. Identifying and capturing recycling that is going into the landfill will increase the City's recycling rate and landfill tipping fees.

Task	Responsible Party
Partner with local business that use recyclable materials.	Private Businesses, Community Organizations
Consider providing mobile recycling units for special events outside of city sponsored events	Public Works
Consider developing a grant or business loan program to encourage "Low to No Waste" business start-ups and growth.	Community Organizations, Economic Development
Consider adding evening hours to the Recycling Convenience Center.	Public Works

Goal 4 - Support and Promote Healthy and Safe Solid Waste Disposal

The ability to dispose of all solid waste materials in a healthy and safe manner is a key component to a sustainable solid waste system. Various waste items are not able to be disposed in the municipal waste stream and alternative collection options help reduce illicit disposal of those materials. In addition, the downtown areas, due to the building density, presents challenges related to waste storage prior to collection. This goal provides strategies that will work to expand these areas with new opportunities.

Where Are We Now?

Initiative	Summary	Status
Ordinance Violation Oversight	The City provides oversight and enforcement of ordinance violations and responds to citizen and personnel concerns.	Ongoing
Household Hazardous Waste Day[53]	In order to limit illicit material in the trash that could come into contact with staff, Rockingham County and the City host a household hazardous waste disposal day and regular prescription medication disposal at the public safety building.	Ongoing
Prescription Medication Disposal	A prescription medication disposal box is located in the Public Safety building. This is a location where the public can drop off their unused mediations for safe and environmentally friendly disposal.	Ongoing

Strategy 4.1 - Continue to Expand the Education Program

Develop an expanded program to educate property owners about safe and sanitary curbside waste disposal, to Recycling Convenience Center users about non-contamination practices, and to students about life cycle analysis, the seven Rs (Rethink, Reuse, Refuse, Reduce, Repurpose, Recycle, Recruit) and plastic reduction.

Task	Responsible Party
Continue to educate the public to remove fluids from waste and recyclables.	Public Works
Continue to educate the public to remove sharp items/hazardous material from the waste stream, and separate cardboard from recyclables.	Public Works
Work with City Schools to integrate waste management into curriculums.	Community Organizations
Continue to educate the business community on reduction, reuse, and recycling programs and initiatives.	Community Organizations

[53] https://www.harrisonburgva.gov/hazardous-waste-collection

Strategy 4.2 - Seek Partnerships for Downtown Centralized Disposal Units

There is limited storage space downtown which makes the temporary storage of trash and recycling a challenge. Therefore, businesses have difficulty holding trash until the designated pick-up times and the city picks up trash twice daily throughout the work week. There are additional concerns with residential customers placing trash out at the incorrect times. This proposed solution would allow businesses and residents to centrally collect their refuse and recyclables for regular pick-up by city staff, eliminating trash accumulation on the curb, reducing emissions from trucks, and improving overall downtown curb-appeal.

Task	Responsible Party
Identify central locations and consider outfitting locations with bins/hoppers/secure access/etc.	Public Works
If centralized disposal units are implemented, educate businesses, property owners, downtown residents, property management companies about the change in service and expectations moving forward.	Public Works

Strategy 4.3 - Improve the Household Hazardous Waste Collection Program

Household hazardous wastes (HHW) are defined as leftover household products that contain corrosive, toxic, ignitable, or reactive ingredients. Improper disposal of HHW can pollute the environment and pose a threat to human health. HHW collection is offered on a semi-annual basis alongside Rockingham County. An expanded program would make drop-off of hazardous waste materials more accessible to the public.

Task	Responsible Party
Consider increasing the frequency of HHW Collection Days.	Public Works, Rockingham County
Study the potential to allow for HHW storage at the Recycling Convenience Center year-round.	Public Works, Rockingham County

Strategy 4.4 – Improve the Safety Prescription Medication Disposal

Prescription medication disposal is available at limited locations throughout and surrounding the City (i.e. Harrisonburg Police Department, Rockingham County Sheriff's Office, Sentara RMH). Expanding the drop off locations for regular pick-up by a hazardous waste vendor allows additional accessibility to customers, making it easier for customers to properly dispose of medications. Improper disposal, such as flushing medications down the toilet, introduces the medication into the environment.

Task	Responsible Party
Encourage pharmacies to host a 'Drug Take Back' program.	Community Organizations, Individuals
Encourage other relevant local businesses to host a 'Drug Take Back' program.	Community Organizations, Individuals

Focus Area 6 – Water Resources

Protect the watersheds of the City of Harrisonburg to secure water supplies, quality, and aquatic ecosystems. Four goals are included in this focus area.

Co-Benefits

Protection of watersheds benefits the public by providing clean and safe drinking water, and provides clean and safe opportunities for outdoor water recreation such as swimming, boating, and fishing. In addition, clean water supplies maintain the aquatic life which inhabits local waters. The water supply supports Harrisonburg's present economic model as well as future development.

Goal 1 - Protect and Secure Drinking Water Sources

The City of Harrisonburg's "raw" water system includes sources from the Dry River, the North River, Silver Lake, and the South Fork of the Shenandoah River. "Raw" water is untreated water from lakes, streams or groundwater sources. Since all source water contains natural chemicals and biological materials, the water from these sources must be treated for human consumption to comply with US EPA requirements for drinking water. The Dry River is the primary and preferred source of water and provides approximately 50% of annual water to the City's water treatment plant. Dry River water is preferred because of its cleanliness and because it is delivered to the treatment plant by gravity flow with zero energy consumption. The North River is the secondary source of water and provides approximately 50% of the annual water to the water treatment plant. At the North River, energy consumption is intermediate in comparison to the City's other sources; however, environmental stress to aquatic life is very high during drought. The South Fork of the Shenandoah River is a future source, which will be vital during drought conditions but carries the highest energy consumption. Silver Lake is an inactive source of water. The combination of water sources allows Harrisonburg to have ample flexibility to adjust water supply to prevailing conditions.

Harrisonburg occupies 17.4 mi^2 within the 853 mi^2 (2%) of Rockingham County, Virginia, yet its water area footprint is estimated at 400 mi^2 of southwestern Rockingham and northern Augusta Counties. In the future, water withdrawals from the South Fork of the Shenandoah River will increase significantly the area of the watershed of concern to the city water supplies. Protection of the watershed includes consideration of anthropogenic pollution inputs upstream of water intakes that could affect the treatment expense of providing drinking water in the City.

Where Are We Now?

Initiative	Summary	Status
Source Water Protection Plan	An assessment of the different raw water supplies, inventory of potential sources of contamination, and determination of each source's susceptibility to contamination.	Complete
Raw Water Supply Management Plan[54]	A city plan that forecasts water demands and outlines strategies to securing sustainable raw water supplies.	Complete
Drought Preparedness and Response Plan[55]	A regional plan that outlines voluntary and mandatory actions to be taken during various stages of drought.	Complete
Virginia Water Withdrawal Permit	Harrisonburg's permit through the Department of Environmental Quality (VDEQ) that requires water withdrawal restrictions to protect environmental integrity.	Complete
Potable Water System Management Plan	A city plan that evaluates and engages sustainability practices for the city's water treatment and distributions systems through evaluation of capacity, management, operations and maintenance. Investments are encouraged to meet established goals where payback is returned within the life cycle of the deliverable asset.	In-progress
Upper Shenandoah River Basin Water Supply Plan[56]	A regional water supply plan that meets requirements of Virginia Legislative Code 9 VAC 25-780, Local and Regional Water Supply Planning.	Complete

Strategy 1.1 - Encourage Land Use Practices That Reduce Pollution Upstream of Water Intakes

The primary water supply for Harrisonburg, Dry River, is collected from a watershed that is predominately owned by the United States Forest Service (USFS) with very little human impact at present time. A narrow strip of land from Riven Rock Park to Switzer Dam is the only city owned land upstream of the intake and activity in this section of the watershed is controlled by the City. Protection of the remainder of the watershed will require the City to be proactive with the USFS on issues that could affect water quality. The secondary water supply, North River, is subject to agricultural and other non-point source pollution (NPS) runoff. The use of Shenandoah River water will increase the risk of NPS pollution issues at the future intake station. There is a level of oversight on pollution sources within the City of Harrisonburg through

[54] https://www.harrisonburgva.gov/water-engineering

[55] https://www.harrisonburgva.gov/sites/default/files/bills/files/Drought%20Preparedness%20and%20Response%20Plan%202012.pdf

[56] https://www.harrisonburgva.gov/sites/default/files/green/Upper%20Shenandoah%20River%20Basin%20Water%20Supply%20Plan.pdf

the MS4 permit program, which requires an illicit discharge detection and elimination program, as well as education about water quality.

Task	Responsible Party
Consider creating a City Watershed Management Committee. This committee would operate similarly to the existing Project Review Teams but with an expansion in scope. The committee would be led by the Department of Public Utilities.	City Manager's Office, Public Utilities
Consider using the Source Water Protection Plan to formulate a protection strategy. Maximum response to source water assessments: city owned land, Harrisonburg City, privately owned land.	City Watershed Management Committee
Continue to use the Municipal Separate Storm Sewer System (MS4) permit program[57] to protect water quality through education, illicit discharge screening, and stormwater management.	Public Works
Consider working with partners to create a threat communication strategy so that Public Utilities is informed of any spills or accidents that have the potential to impact the water supply.	City Watershed Management Committee, Community Partners
Continue to take an active role in the Shenandoah Valley Soil and Water Conservation District[58], which administers programs and funds to aid farmers in reducing NPS and serves for communication exchange between various government agencies (Virginia Department of Environmental Quality, Natural Resources Conservation Service, Virginia Department of Forestry, etc.) Currently on the SVSWCD board there are two elected directors and two appointed associate directors who are Harrisonburg city residents.	Community Organizations

Strategy 1.2 - Consider Producing an Environmental Study Defining Values Provided by the Dry River Watershed

As indicated above, the Dry River provides clean, inexpensive water that has been delivered to Harrisonburg since the end of the 19th century. Its name derives from the sinks that occur downstream of the Rawley Springs area where the river encounters karst topography. Upstream the river flows over bedrock of shale and sandstone and has perennial surface flow. The stream supports unique flora and fauna in the city owned reach including the state fish: the native brook trout *Salvelinus fontinalis*. The range of the native trout here is the largest reach of contiguous water remaining in Virginia. The fact that the City owns about 8 miles of this river is impressive and something for which we should be proud. This resource benefits many people who use the city owned property for nature-based recreation such as fishing, hiking, botany, hunting, bird watching and other low impact activities that do not affect water quality. Thus, the direct value of the Dry River for water supply is supplemented by these other activities

[57] https://www.harrisonburgva.gov/MS4-permit-program
[58] https://svswcd.org/

that bring revenue back to the City in the form of lodging, food, entertainment, etc. The income benefit to Harrisonburg should be established to aid in protection of the Dry River. There have occurred historic and illegal activities such as off-road motor vehicles, trash dumping, and camping that should be prevented in the future. Recreational trails and low impact vehicular parking sites should be considered. Educational outreach and opportunities for the school system should be studied.

Task	Responsible Party
Ascertain the true services value from the watersheds to the Harrisonburg and local economy and consider a master plan for city owned land in the Dry River Watershed.	City Watershed Management Committee, Community Organizations
Consider creating an awareness and education strategy to increase safety of the Dry River Water Supply.	City Watershed Management Committee, Community Organizations
Consider periodically reviewing threats, valuation and communication about the Dry River Water Supply. Address illegal activities and explore future uses in the area.	City Watershed Management Committee, Community Organizations

Strategy 1.3 - Continue to Maintain Minimum Instream Flows

Water diversion from a stream can reduce normal flows to the point that stress can cause mortality of aquatic life. Currently, Harrisonburg's Virginia Water Withdrawal Permit protects in-stream aquatics through maximum in-stream withdrawal percentages at the North River Intake (NRI) and the South Fork Shenandoah Intake (SFI) and through a required bypass at the Dry River Intake (DRI).

Upstream of the city's DRI, water is currently released from Switzer Dam. This discharge benefits the City water supply by maintaining the intake volume while simultaneously providing habitat for aquatic organisms. With this water release the City avoids the considerable expense of pipeline construction and maintenance while supplying stream water.

Task	Responsible Party
Maintain in-stream flow and bypass as required by the VDEQ-City Virginia Water Withdrawal Permit for DRI, NRI, and SFI.	Public Utilities
Continue to hold contingency reserves to protect water supply during drought conditions and recognize the need to balance water supplies to avoid dewatering the downstream basin, which could cause aquatic mortality.	Public Utilities

Goal 2 - Implement the Water Use and Water Loss Management Plans

Harrisonburg's economic development is dependent upon adequate energy and water resources for future development. In the past, development has been based upon utilizing a greater and greater proportion of available natural resources. However, the population of many metropolitan areas and their surroundings have exceeded available water supplies, and while this condition has been present in the western states for decades, eastern metropolitan areas like Atlanta, Miami, and numerous other communities are now also seeing economic development limited by water resources. The State Water Resources Plan[59] identified 12 challenges for future water resources management, including: ensuring adequate water supply is available state-wide; improving monitoring of water flow, storage and availability both above and below ground; and better education and communication with the public.

Harrisonburg's Water Use and Water Loss Management components of the Raw Water Supply Management Plan and the Potable Water System Management Plan outline how HPU will handle water conservation as well as minimize water loss.

Where Are We Now?

Initiative	Summary	Status
Water Use Plans	Water and sewer demands for City buildout based upon occupancy and zoning have been forecasted with multiple updates including the last update for Fiscal Year 2017-2018.	Ongoing
Water Loss Management Plans	The Environmental Protection Agency estimates that average water loss in water systems is around 16%; Harrisonburg's water loss has ranged from 11% to 16% percent since 2008. The Water Loss Management agenda outlines how HPU will minimize water loss.	Ongoing
Water Conservation	Analysis of Harrisonburg water use data indicates that per capita consumption has decreased approximately one percent annually since 2008. City ordinances for more strict and shorter application of conservation mandates have been drafted and adopted.	Complete

59 https://www.deq.virginia.gov/Programs/Water/WaterSupplyWaterQuantity/WaterSupplyPlanning/StateWaterResourcesPlan.aspx

Strategy 2.1 - Remain Proactive in Water Demand Forecasting and Capacity Planning

Harrisonburg Public Utilities works collaboratively with the Economic Development and Community Development departments, as well as executive management, to establish future water needs and expected growth rates. The results provide the framework for future planning including compliance with Virginia State Legislative Code 9 VAC 25-780 through a regional effort in the "Upper Shenandoah River Basin Water Supply Plan".

Task	Responsible Party
Continue annual forecasting updates. Water demand forecasting is based on a scenario where all vacant properties are developed and where water uses in currently occupied properties may shift due to reasonable zoning or development changes. The City Water & Sewer Forecasting Team is led by the Department of Public Utilities and includes the: City Manager's Office, Community Development Department, Economic Development Department, Information Technology Department (specifically GIS), and the Public Utilities Department.	City Water & Sewer Forecasting Team
Continue updating the Regional Water Supply Plan. The Regional Water Supply Plan transitions the forecasts for future water demand across source waters under selected growth rates. The original plan was completed in 2013 and updated in 2018. The next required update is in 2023.	Public Utilities

Strategy 2.2 - Continue to Encourage Responsible Water Use Throughout the Year

Analysis of Harrisonburg water use data indicates that per capita consumption has decreased approximately one percent annually since 2008. Water conservation effects can be achieved through various ways that include water pricing strategies, regulations, modifications to user practices and education outreach. Water conservation (use reduction) will be selectively encouraged through the tasks outlined below.

Conservation strategies will require offsetting revenues due to 85-95% of business costs being fixed with no direct relationship to daily water production.

Within the bottom line include enough funding to meet long term financial model goals including all identified funding needs with specific emphasis upon the effective and efficient retirement of existing aging assets.

Within the bottom line consider water conservation incentives or high consumption deterrents to avoid seasonal environmental stresses and to avoid longer term investments into additional unsecured water sources. Consider customer class usage and conservation targets, especially emphasizing residential users.

Task	Responsible Party
Evaluate, and if warranted, develop an implementation plan to revise, the existing water and sewer purchase rate schedules (alternatives to declining block rates which provides lower unit purchase rates with higher consumptions; alternatives to the minimum charge that has no financial incentive to conserve at less than minimum volumes) to encourage a balanced multi-bottom line approach.	Public Utilities
Continually evaluate and commensurately set impact fees and connection fees for new construction to appropriately share the cost of common infrastructure with existing customers.	Public Utilities
Continue to support practices that require new development to install their needed local infrastructure with minimal financial subsidies from the City to avoid cost burden upon existing customers.	Public Utilities
Continue to coordinate with the Water Use Plan, the Zoning Ordinance, and Building Code to ensure future water demands are within the capacities of secured environmentally permitted water supplies.	Community Development, Public Utilities
Explore incentives for new construction to be built to high water conservation standards. Consider encouraging water conservation to allow for the expansion of economic development within permitted limits from local, regional and state-wide water resources.	Community Development, Public Utilities
Improve monitoring and assessment methods of unpermitted withdrawals, especially during seasonal flows.	Public Utilities

Strategy 2.3 - Continue to Encourage Seasonal Water Conservation

During drought-prone months (July-November) Harrisonburg adds a seasonal surcharge on water rates and thus to water bills. This strategy will evaluate the seasonal water rate charge to see if changes are needed to better encourage water conservation during the most environmentally sensitive period of the year.

Task	Responsible Party
Consider setting conservation targets for the seasonal water rate charge, evaluate effectiveness and make changes as necessary.	Public Utilities

Strategy 2.4 - Continue Responsible Water Use During Drought Conditions

Harrisonburg's water conservation ordinance was coordinated through its Virginia Water Withdrawal Permit (VWP) to engage water use constraints upon meeting the established triggers specifically adapted to local environmental conditions.

Task	Responsible Party
Continue to meet the requirements of the VWWP.	Public Utilities
Continue to educate the public about water conservation and conservation requirements during drought conditions.	Public Utilities

Strategy 2.5 - Minimize Water Loss by Implementing the Water Loss Management Plan

The Water Loss Management Plan outlines ways in which water loss will be managed through maintenance, leak detection, and investments in new infrastructure.

Task	Responsible Party
Continue to respond immediately (on and off hours) to remediate water main failure events.	Public Utilities
Continue strategic planned maintenance program for annual leak detection surveys.	Public Utilities
Continue strategic planned maintenance program for annual large meter testing, repair, and retirement.	Public Utilities
Continue strategic planned maintenance program for annual small meter retirement through the Capital Improvement Program (CIP).	Public Utilities
Consider investment of CIP into Advanced Metering Infrastructure (AMI) technology for meter use monitoring and leak management.	Public Utilities
Continue investments for, and use of technology to facilitate, internal water audits for water loss identification from the water system.	Public Utilities
As the guideline for potable water system management, continue to engage asset management principles that include inventory of assets, Level of Service (LOS) standards; criticality assessment and condition assessment. Use this information to prioritize predictive, preventative, and corrective maintenance as well as asset retirement planning. Inclusive is performance benchmarking for managing water system water losses, energy use, asset life cycle cost, regulatory compliance and customer satisfaction. Investments are encouraged to meet established goals where payback is returned within the life cycle of the deliverable asset.	Public Utilities
Continue to support the asset replacement component for the "Long-term Financial Model", specifically the pipe replacement component.	Public Utilities

Goal 3 - Protect Stream Health through Sanitary Sewer Management

The City of Harrisonburg owns and operates a sanitary sewer system that collects sewage and transports it to the Harrisonburg Rockingham Regional Sewer Authority (HRRSA), where water treatment occurs before water is discharged into the South Fork of the Shenandoah River. In many areas, sanitary sewer is adjacent to, or in, Blacks Run and other waterways. As in many communities, inflow and infiltration, overflows, and aging infrastructure pose problems to the sanitary sewer system and water quality.

Where Are We Now?

Initiative	Summary	Status
Sanitary Sewer Management Plan[60]	A city plan to guide evaluation of capacity, management, operation and maintenance of the sanitary sewer infrastructure as it increases and ages.	Complete
Level of Service Study (LOS) for Interceptors	A study that will define a level of service (LOS) of sanitary sewer interceptors, where LOS is defined as the peak flow reoccurrence that the sanitary sewer can convey without resulting in a capacity related sanitary sewer overflow.	In-progress
Septic System Management Program[61]	In 2018, a new program was implemented that requires septic systems to be inspected and pumped once every five years, as well as an additional program created that provides financial incentives for property owners that wish to disconnect from their septic system and to connect to the sanitary sewer system.	Complete

Strategy 3.1 - Meet Sanitary Sewer Level of Service

Interceptor sewer pipes are the largest diameter lines in the sewer system. They receive wastewater from trunk sewers and convey it to the wastewater treatment plant. Sewer pipes are designed to carry sanitary sewer, but occasionally storm-water and groundwater enters the system as well (called inflow and infiltration, or I&I), increasing the flow inside the pipes. When flow inside the interceptor exceeds capacity, a sanitary sewer overflow will occur. The interceptor level of service (LOS) defines the maximum hydraulic capacity of wastewater and I&I the interceptors can handle. A higher LOS means there will be less SSOs during storm events when infiltration is occurring because the interceptors have a higher hydraulic capacity; however, interceptor capacity improvements are expensive.

[60] https://www.harrisonburgva.gov/water-engineering
[61] https://www.harrisonburgva.gov/septic-assistance

Task	Responsible Party
Complete Level of Service Study for Harrisonburg Sewer Interceptors. Identify investments needed to meet 10 years LOS goals. Include the study goals into the sewer Capital Improvement Program.	Public Utilities
As the guideline for sewer system management, continue to engage asset management principles that include inventory of assets, Level of Service (LOS) standards; criticality assessment and condition assessment. Use this information to prioritize predictive, preventative, and corrective maintenance as well as asset retirement planning. Inclusive is performance benchmarking for managing sewer system integrity and overflow frequency, energy use, asset life cycle cost, regulatory compliance and customer satisfaction. Investments are encouraged to meet established goals where payback is returned within the life cycle of the deliverable asset.	Public Utilities

Strategy 3.2 - Reduce Additional Loads on Sanitary Sewer

Interceptor capacity improvements are often paired with inflow and infiltration (I&I) abatement programs to meet a designated LOS and reduce sanitary sewer overflows (SSOs). Additional loads on the sanitary sewer system come from illicit connections such as storm pipes accidentally connected to sewer pipes.

Task	Responsible Party
Continue to implement the I&I program: use flow monitoring to prioritize areas of investigation; rank assets with suspected I&I issues; visually inspect, dye test, CCTV inspect, or smoke test for confirmation of problems; remediate issues.	Public Utilities
Consider a cooperative I&I Program: facilitate a sanitary sewer and storm-water program to help solve I&I issues on private property through a cooperative arrangement.	Public Utilities & Public Works

Goal 4 - Protect and Enhance Water Quality of Surface Water and Stormwater Runoff

The City of Harrisonburg is drained mostly by Blacks Run, which is a limestone spring origin stream and is one of many freshwater streams that are tributaries to the Chesapeake Bay. In fact, a main reason the City grew in its early days was due to a large spring in the downtown center near the courthouse. A large part of historic Harrisonburg lies astride the stream or near the 100-year floodplain. Like most urbanized streams, Blacks Run water quality has been degraded by past historic activity. In the present-day proximity of sanitary sewers in the stream channel and rain and snowmelt runoff that carry contaminants into it. As part of the Chesapeake Bay TMDL, efforts are underway to reduce nutrient loading including storm-water management. Other streams, ponds and surface waters are found in neighborhoods, on college campuses and in parks in the City that have aesthetic and other values to the City.

Where Are We Now?

Initiative	Summary	Status
Stormwater Improvement Plan[62]	The Stormwater Improvement Plan is a long-range visionary plan that outlines how storm-water utility fee funds will be invested in projects to filter, control, and treat polluted runoff.	Complete
Chesapeake Bay TMDL Action Plan[63]	Harrisonburg must comply with permit regulations that require reductions in sediment, phosphorous, and nitrogen by 2028 in order to clean the Chesapeake Bay.	In-progress
Blacks Run/Cooks Creek TMDL Action Plan	The Blacks Run and Cooks Creek TMDL requires reductions of phosphorous and nitrogen above and beyond what is required by the Chesapeake Bay TMDL.	Upcoming

Strategy 4.1 - Reduce and Improve Stormwater Runoff

As a permitted MS4 community within the Chesapeake Bay Watershed, Harrisonburg is required to reduce nutrient and sediment loading from storm-water runoff. How the City accomplishes this goal is set forth by the Storm Water Improvement Plan (SWIP). The majority of the SWIP incorporates BMPs to improve stormwater quality. Direct measures to improve storm-water quantity should also be incorporated to reduce flooding and erosion downstream.

Task	Responsible Party
Continue to implement SWIP and develop innovative BMPs to improve quality of stormwater runoff.	Public Works
Consider developing a Stormwater Drainage Improvement Program to reduce flooding in sensitive areas and implement more control measures to capture and slow stormwater runoff.	Public Works

[62] https://www.harrisonburgva.gov/stormwater-improvement-plan
[63] https://www.harrisonburgva.gov/MS4-permit-program

Strategy 4.2 - Improve Stream Health

Stormwater runoff reduces stream health by quantity (erosion) and quality (nutrient loading and sedimentation). Due to the large amounts of impervious surfaces or gray infrastructure within the City, stormwater runoff is a big component of pollution source. An increase in Green Infrastructure is needed to offset the gray infrastructure. The City needs to increase tree canopy coverage and riparian buffers throughout the city, thus reducing stormwater runoff.

Task	Responsible Party
Consider setting a goal to increased tree canopy coverage, by a certain percentage throughout the City to reduce storm-water runoff according to the Tree Canopy – Green Infrastructure Center (GIC) study.[64]	Public Works, Parks and Recreation, Community Development
Consider creating and maintaining riparian buffers on all public property where waterways are present.	Public Works

[64] https://www.harrisonburgva.gov/tree-canopy-grant