Sustainable FREDERICK

Sustainable Frederick

Amee Bearne, Adam Chamy, Albert Engel, Rebecca Habtour, Oren Hirsch,
Christopher Johansson, Boaz Kedar, Max Pastore, Ryan Rattanni, Abby Tesfaye

Design by Max Pastore | Edited by Amee Bearne

Professor James Cohen, PhD

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Uri Avin, PALS Director

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A Sustainable Frederick

Introduction

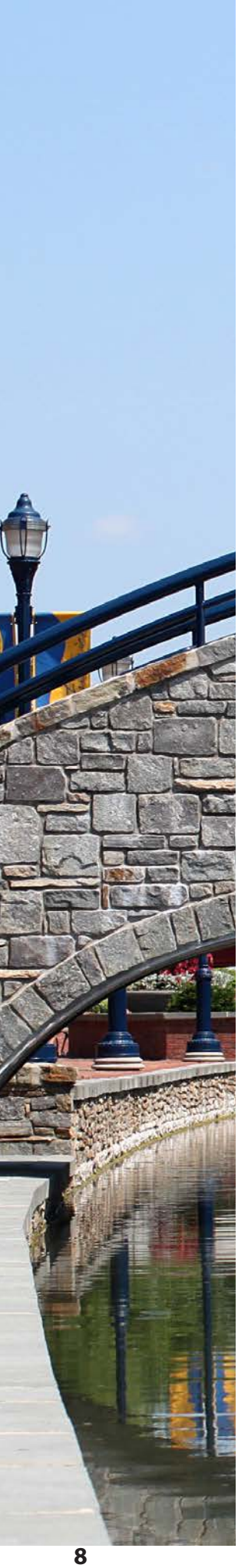
Purpose of this Document

During the academic year and the summer, master's students in the University of Maryland's Urban Studies and Planning Program (URSP) are able to fulfil their requirement for a community planning studio. In the studio, students conduct research on a key planning issue or issues in a given study area, based on input from public officials, public agency representatives, community activists and other stakeholders. The students design the research strategy, collect and analyze primary and secondary data, and produce a written report with findings and recommendations.

This summer 2015 studio report is somewhat different from previous studio documents. The report was created in the same academic year in which the University of Maryland premiered its Partnership for Action Learning in Sustainability (PALS) program. Created by the University's National Center Smart Growth Research and Education in 2014, PALS offers the opportunity for UMD faculty and students to explore – and make recommendations for addressing – challenges identified by a city or county in Maryland related to economic opportunity, environmental quality and/or social equity.

The jurisdiction selected to be the site for the premier year of the PALS program was the City of Frederick. From September of 2014 through August of 2015, thirty (30) UMD classes focused part or all of their attention on a sustainability-related issue or challenge that the City requested to be studied. In April of 2015, the City also completed a draft sustainability plan.

This studio report consists of a suggested sustainability plan for the City of Frederick. The report builds on the City's draft sustainability plan by expanding the current plan elements; adding material related to economic opportunity and social equity considerations; adding two new plan elements (economic development and housing); and drawing on material from other selected PALS class reports. The students hope that the City officials and planners, and others who actively participated in creating the current sustainability plan draft, will find it useful in their efforts.



How to Use the Document

In "The Plan" section, each topic chapter has two sub-headings: Highlights and Analysis. In the Highlights section the reader will find all the goals with associated objectives. These objectives (unless otherwise noted) are defined by a target and year that are undecided. For example, objective 2 of goal 1 in the Energy Solutions chapter states, "Upgrade (percentage) of Aging Lighting Infrastructure by (year)." In this way the authors allow the City to determine the best target amount and year for each objective. However, there are some objectives that have targets determined. In these objectives notation will be given stating where those targets were acquired and why they were chosen.

Each objective has a lead agency that should take charge in ensuring the objective progresses in a timely manner and that associated actions are being accomplished. Under each objective are actions deemed necessary to accomplish the objective. With each action an agency or department has been identified as appropriate to undertake the action. Once again, the City can and should make changes as needed to agencies/departments associated with particular actions and/or objectives.

The second half of each chapter is the "Analysis" section. This portion of the chapter recalls all the information given in the Highlights section while giving in-depth explanation for why such recommendations were chosen, using case-studies, scholarly articles, and other information gathered through reliable sources.

Defining Sustainability

What is sustainability?

Sustainability is a comprehensive approach to living on the planet in a way that meets human needs without compromising the ability of future generations to meet their needs. It is often defined through reference to three "E"s: environment, economy and equity. We promote sustainability by living within the Earth's carrying capacity, by providing opportunities for families and individuals to obtain the material necessities for a decent life, and by providing protection of their rights.

What are characteristics of a sustainable city?

A sustainable city benefits everyone by having energy-efficient buildings, accessible and environmentally friendly forms of transportation, a range of employment opportunities, ample recreation spaces, and healthy places to work and live. A city can work towards becoming a more sustainable community through such actions as:

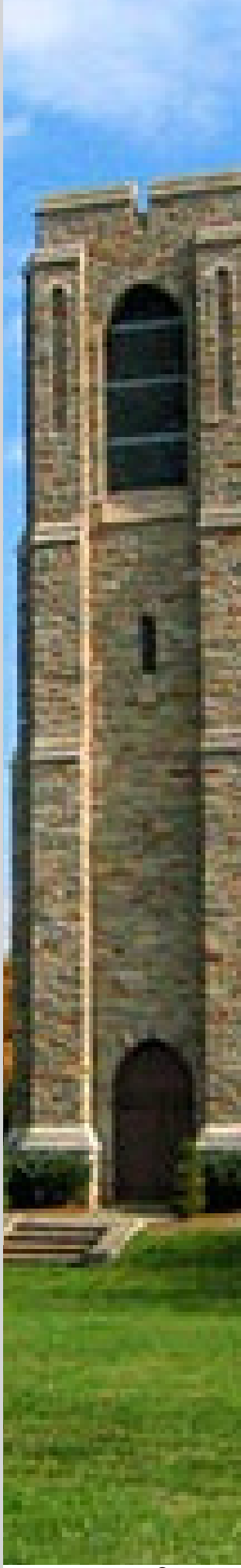
1) Supporting a strong, local economy with better access to jobs, services, and amenities encouraging healthier lifestyles by providing alternative transportation options and access to nutritious food choices

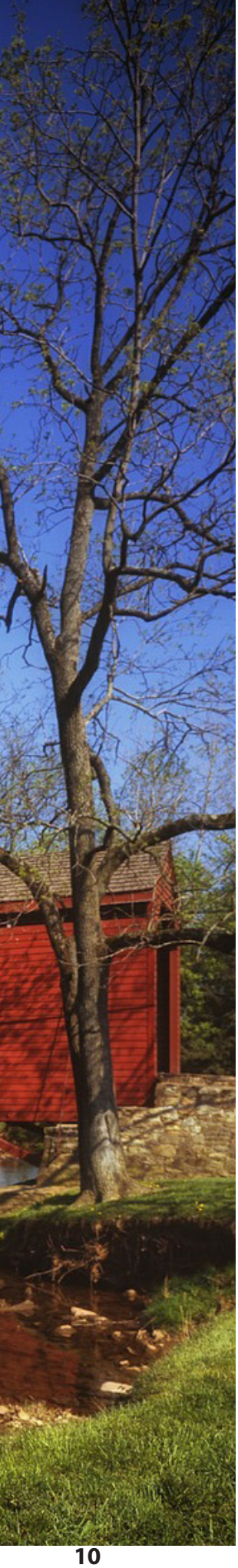
2) Leading the way in more efficient and renewable energy and fuels to reduce costs and our carbon footprint

3) Protecting water quality and green spaces while enabling smart development providing housing opportunities to families and individuals of all income levels, in neighborhoods that provide quality services and amenities

How do we make it happen?

We can achieve sustainability through a collaborative process. Each of us plays an important part in creating and maintaining a sustainable Frederick. The City government is leading this effort, but public participation from residents and private businesses is also essential to achieving these goals. The next step along with implementing this plan is increasing public participation. By building partnerships with various committees, interest groups, local and state government, and within City departments, sustainable ideas and actions will filter through projects on every level. This plan outlines actions and policies that could help each of us to become part of the sustainability solution. This Sustainability Plan will be evaluated every two years to assess progress towards existing objectives, outline new objectives, and identify new opportunities for policies and actions.





Organization of the Plan

This Sustainability Plan focuses on the following ten topics:

Energy Solutions

Water Quality

Air Quality

Urban Canopy

Waste & Recycling

Economic Development

Built Environment

Housing

Transportation

Food & Nutrition

Each of these plan elements is linked to the others and should be considered in future City design and planning efforts. Taken together, the plan elements are intended to address environmental, economic, and social components of sustainability. This Plan incorporates goals, objectives, and actions for each department within the City's operations that will benefit residents, business owners, visitors, and City employees.

About the City of Frederick

Dating back to 1745, the City of Frederick, Maryland is one of the most historic and charming communities in the country. Much of Frederick's vibrant downtown was established between 1810 and 1860, as Frederick began to flourish as a market town rooted in a rich agricultural heritage.

An eighteenth-century Englishman marveled over the land, "heavy, strong and rich, well suited for wheat, with which it abounds" (History Architecture, 2005). Acting as a hospital town for wounded soldiers during the Civil War, Frederick was spared the destruction of a direct battle. The city's expansion continued as Route 15 became an important regional connector and the Pennsylvania Railroad, which arrived in 1872, supported growing industries led by canning, tanning and knitting.

Today the City of Frederick has a strong sense of place, a rich heritage and a robust and diverse economy. Scenic views of the Catoctin Mountains create a beautiful backdrop for a city with diverse local job opportunities, growing multi-modal transportation options, a range of housing opportunities, plentiful parks and recreation, lively arts and entertainment, quality education and health care, strong community and business partnerships, well managed public services, and an accessible government. Its location within 50 miles of Baltimore and Washington D.C. also makes Frederick attractive to residents who commute to jobs in these neighboring urban centers. Experiencing substantial growth and development over the last several decades and expecting more to come, the City of Frederick has chosen to manage its growth so that it will continue to be an attractive urban employment and residential center while maintaining its historic charm, distinct neighborhood character, and exceptional quality of life.

Challenges and Opportunities

Downtown Frederick is principally defined by Market Street, the main commercial spine of the city, and Carroll Creek which passes through Baker Park and residential neighborhoods on the city's west side, and terminates in the light industrial areas on the east. Severe downtown flooding in the 1970s led Frederick to invest in a large infrastructure project which redirected Carroll Creek's overflow to underground conduits, maintaining a portion of the river in a controlled channel above ground, complementing a new linear park. The Carroll Creek Park offers public outdoor space, retail opportunities, civic amenities and acts as a vital connection in a growing multimodal path system. More than $150 million in private investments are underway or planned in new construction, infill development or historic renovation in the park area. With the growing positive impact of the Carroll Creek project on downtown, Frederick still needs to extend its efforts to other areas of the city.

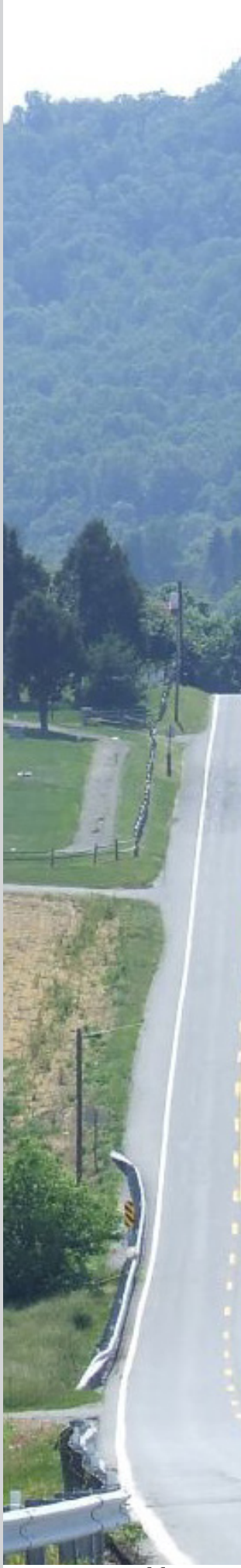
As Frederick continued to expand in the decades after WWII, the neighborhoods closer to Route 15 along Jefferson and Patrick Streets took on an automobile-oriented form, with large retail shopping centers, large surface parking lots, large setbacks and limited connectivity for pedestrians and bikers to access downtown. The Golden Mile developed as a high speed road with limited safe crossings, very little tree cover, extensive impervious surface, a lack of a coherent pedestrian environment, as well as dangerous conditions for bikers.

Reimagining these street sections to include walkable features, like improved tree cover, permeable paving, more frequent crossings, reduced setbacks, as well as safe paths for bikes, will create more lively and desirable spaces. The large areas of surface parking lots on West Patrick, Jefferson and West South Streets offer opportunities to create an iconic new central hub for the West Side of the City of Frederick, which can act as a meaningful landmark, reinforcing a positive neighborhood character. Taking into account contemporary desires for more connected walkable, bikeable communities, Frederick needs to transform some of this urban fabric to remain attractive to new residents and employers.

The east side of Frederick has been an industrial asset to of the city since its growth in the late nineteenth and early twentieth centuries. Recent planning for this part of town has recognized the potential for redevelopment, and has put forward a vision that would transform East Street into a more pedestrian friendly street, redevelop the Brick Works and build a new commuter rail station on the MARC system. Redeveloping brownfield sites, without displacing still active and valued industries, poses a challenge and will require the City to find ways to create buffers and carefully select appropriate adjacent land use.

The Monocacy River, Linganore Creek and Fishing Creek Reservoir are important contributors to the city's drinking water supply and vital to the well-being of the city's population. The mixed land uses of upstream the city's intake—both agricultural and dense urban areas—leaves the watershed vulnerable to runoff from farmland and impermeable surfaces causing several water quality concerns. However, many of the potential measures to protect water resources and restore a damaged watershed can also be beneficial to the city's economic bottom line and improve the quality of life for residents.

The City of Frederick has been actively planning for bicycle transportation and walkability since 1990. An existing plan calling for Shared Use Paths that link major city, state and national trails is in place. Partnering this multimodal approach to connectivity with land use will not only reinforce the positive steps the City has already taken, but will help accommodate greater density and growth within a more compact and efficient infrastructure. In the comprehensive plan, citizens identified equitable access to diverse job opportunities, affordable housing choices and access to quality amenities as important concerns for the City. Addressing all of these sustainability challenges will require careful planning and forethought, an ongoing concerted effort from multiple partners, and buy-in from the citizenry.



The Good News Is

The City of Frederick is committed to sustainability – in terms of environmental quality, economic opportunity, and social equity – for everyone who lives, works, and plays in the city. With participation from businesses, residents, and government, we will create a city that is resilient at its core and periphery and will become a sustainability model for the region. This plan is the City's framework to tackle challenges and prioritize policies and actions that will guide Frederick toward a more sustainable future. The policies and actions suggested in this plan will help the City provide residents with access to transportation, healthy food, educational and cultural resources, green spaces, clean air and water, economic opportunity, and housing.

Green Initiatives Team (GIT)

The Mayor's Green Initiatives Team is an ad hoc committee formed in 2011 (Resolution number 11-17) of community members interested in furthering the sustainability goals of the City. The GIT should be evaluated to determine if it could be upgraded from its current ad hoc status to a permanent standing committee. A standing committee will show the City's commitment to sustainability. With experts in various fields such as energy, water, and green building as part of the team, the GIT has an opportunity to help the city become a sustainability leader for the region. As a standing committee, the GIT would be able to take on more in-depth projects that will ultimately help the City meet its sustainability goals.

County and City Profile

At 667 square miles, Frederick County is Maryland's largest county by land area. The county straddles both urban and rural Maryland. It is the state's largest dairy producer, while also home to a growing high tech and bioscience hub (Frederick County 2015). The population of Frederick County is over 236,000, and it's been the third fastest growing county in the state over the last five years. By 2030, population is projected to increase 50 to 80 percent for several parts of the county, including the City of Frederick (Frederick County 2006).

Compared to the rest of the state, Frederick County is less racially diverse. Over three quarters of the population are non-Latino white, compared to just over half the state's population (U. S. Census Bureau n.d.). The county has a higher percentage of college educated residents compared to the rest of the state, and fewer (8 percent versus 11 percent) residents without a high school degree. Median household income is also higher in Frederick County compared to the state ($84,570 versus $73,538), along with the percentage of owner-occupied housing (75 percent versus 68 percent). Similar to the state, the Frederick County working population is car dependent, with more than three quarters commuting alone by car, truck or van.

The City of Frederick is the seat of Frederick County covering 22.2 square miles. With a population of over 65,000, Frederick is the 2nd largest incorporated city in Maryland (U. S. Census Bureau n.d.). The city rests at the foot of the Catoctin Mountains. Carroll Creek flows through the city and into the Monocacy River, which feeds into the Potomac River. While the city is proximate to these important natural resources, it is also the northern anchor of the I-270 high tech corridor, and is located 50 miles from both Baltimore and Washington, DC. Frederick's location has supported a diverse economy, which includes the U.S. Army's Fort Detrick research facility, the Frederick Municipal Airport (the second busiest airport in the state), a vibrant retail and entertainment center in its historic downtown, and a cluster of pharmaceutical, biotechnology and IT firms.

On a number of demographic measures, the City of Frederick more closely mirrors the state than the county. It is more diverse, with the percentage of non-White and/or Latino residents at nearly 41 percent, compared to 20 percent for the county and 44 percent for the state (U. S. Census Bureau n.d.). The city's poverty and unemployment rates are also closer to the state than the county. Median household income, at nearly $66,000, is lower than both the county and the state. One area where Frederick stands out from the state is its highly educated population: 37 percent of residents have at least a Bachelor's degree, versus 20 percent for the state and 23 percent for the county.

Neighborhood Profile

While it is important to understand the city and county context for this plan, neighborhood level data can be an effective unit of analysis in determining recommendations for sustainability initiatives. For instance, marketing efforts to promote car sharing could target neighborhoods with high numbers of car commuters. Neighborhoods with minimal park areas could be prioritized for green space projects. Additionally, neighborhood level data can reveal inequities, where segments of the city's population fail to benefit from the overall growth of the economy. For this purpose, we designated Frederick's Neighborhood Advisory Councils (NACs), developed in 2002 as community engagement forums, as our units of analysis for a neighborhood level profile (City of Frederick n.d.). We compiled the most recent American Community Survey data from 2009-13, along with land area and crime statistics, for 11 NACs and the city, county and state (see chart in Appendix A.1).

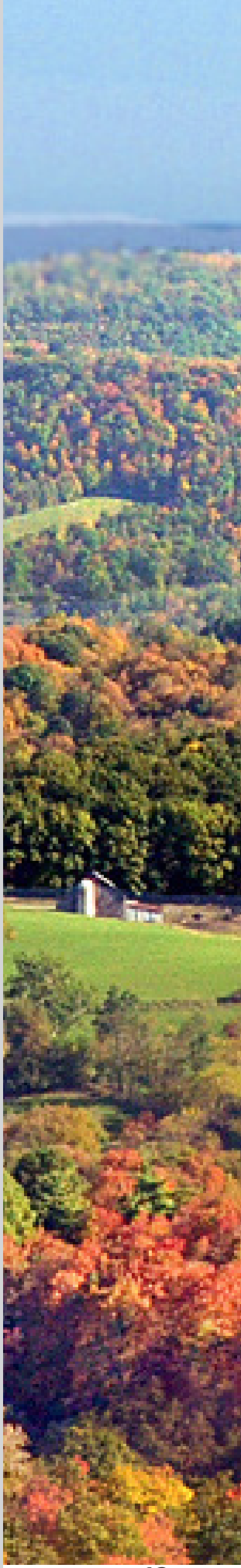
Our data reveals that while the city overall is healthy economically, there are several NACs (5, 8, and 12 in particular) with significant levels of poverty, unemployment, and residents with less than a high school degree. Appendix A.2 includes the following four maps:

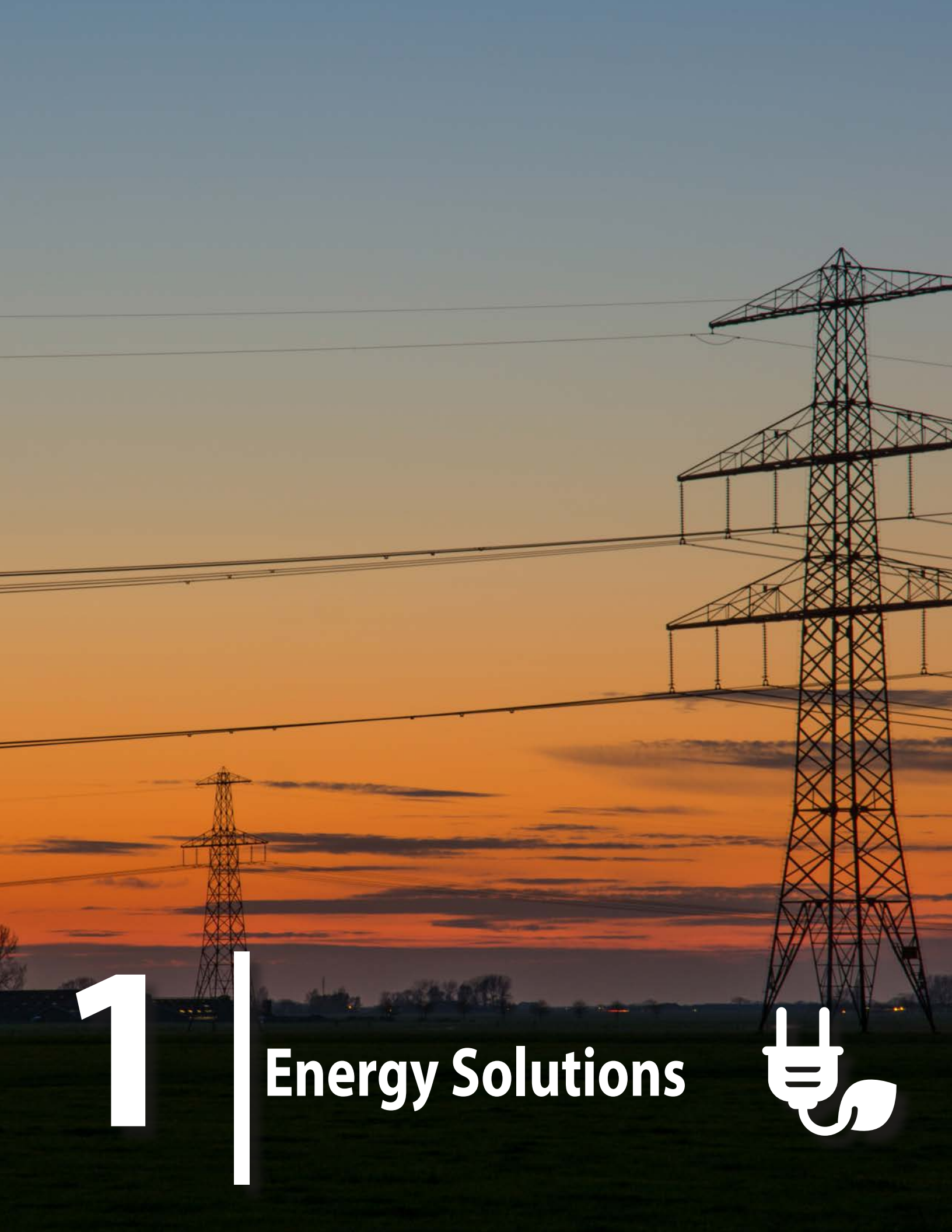
Map One visually demonstrates the variations between NACs, where those with a higher median household income also tend to have higher levels of educational attainment, percentage of non-Latino white residents, owner-occupied housing and median home value. This leaves some NACs trailing on a number of socioeconomic factors, including those with significant black and Latino populations. Our finding of significant variations between NACs is underscored by a recent University of Maryland study of Frederick, which utilized both block group and census tract data (Boston, Choudhry and Davis n.d.). The authors employed grouping analysis to differentiate parts of the city based on several variables, and found that median household income and tenure are the most influential variables that sharply divide areas of the City.

Map Two reveals a correlation between crime, poverty and income. While there was no strong correlation between NACs with higher poverty and higher crime rates, the NACs with either higher median incomes and/or lower poverty rates were also those with lower total crime rates. By combining both income and poverty, the map more effectively captures that correlation.

Map Three includes total population, children under 18, adults over 65, and households with limited English language proficiency. NACs vary widely by population, with nearly 12,000 residents in NAC 5 and only 710 residents in NAC 12. As is evident in the map, those with a larger percentage of children also have higher rates of limited English-speaking households.

Map Four displays four variables, median household income, owner occupied housing, median rent and median home value, as binary values, whether they are above the city average or below the city average. One would expect for all four of these variables to correlate with one another, such as how NAC 1 has above average income, rates of home ownership, home value and rent. Yet four out of the 11 NACs fail to positively correlate across all four variables. One example of note is NAC 10, which has low median income, home value and home ownership rates, but has higher than average rent. These inverse relationships could have implications for housing affordability and ownership and may be worth a closer look.





1 Energy Solutions

Introduction

Goals:

1. Create a sustainable lighting system.
2. Reduce Frederick City's private sector and residential energy demand.
3. Increase the proportion of energy sourced from clean and renewable supplies in the private sector and major institutions.
4. Upgrade energy infrastructure city-wide for improved efficiency and reliability standards for the highest quality energy infrastructure for improved efficiency and reliability.
5. Cultivate a sustainable workplace and City operations that maximizes use of renewables and uses energy efficiently.

Many City-owned buildings have received upgrades to lighting and HVAC systems to reduce energy costs and reduce use of power generated by fossil fuels. The aging lighting infrastructure presents a challenge to upgrading to the most efficient lighting choices, but these upgrades will help the City meet its Maryland Smart Energy Communities (MSEC) goal of reducing per-square-foot electricity consumption by 15 percent over the next five years, as established via policy in November 2014.

The City of Frederick uses nearly 24 megawatts of power per year, based on the MSEC 2013 baseline report for City-owned structures. The report also revealed that 44 percent of the city's energy usage is for water facilities. Street lights were 25.2 percent of the total. Occupied spaces, such as offices, use 17.4 percent and other non-occupied spaces, such as park pavilions, use 13.4 percent.

To reduce energy usage, the City is beginning to update its street lights to the latest technology. Many of Frederick's street lights are difficult to maintain because they date back to the 1950s and 60s.

Maryland allows customers to choose their energy supplier. The City seeks the least expensive energy options, which can mean power supplied by burning fossil fuels. As renewable energy sources such as solar and wind become available, they may become more cost competitive in the future.

In addition, Frederick already has a few hybrid vehicles in its fleet. The high cost of fuel-efficient, hybrid, natural gas, and electric vehicles make it difficult to green the fleet, but increasing the number of these vehicles will help the City reduce its carbon footprint and improve air quality and save in fuel costs.

To establish itself as a leader in green energy solutions, the City should endeavor to find ways to incorporate solar in public spaces, such as parking lots, parks, and other visible areas that can serve to increase resiliency, reduce reliance on fossil fuels, and as an educational opportunity. In addition, the City should explore the feasibility of electric vehicle charging stations coupled with solar for residents and its own fleet and possible incentives for drivers of those vehicles.

Successes to Date:

1. Energy Efficiency Upgrades: Through a Maryland Smart Energy Communities (MSEC) grant the City has established baselines for its utilities and its fleet and is prioritizing projects. The grant provides for energy efficiency upgrades, such as lighting in City Hall, William Talley Recreation Center, and for street lights in the 2015 fiscal year.
2. Support for a Sustainable Future: In addition to the goal to reduce energy consumption, the City also adopted a goal of generating 20 percent of its energy from renewable sources.

1 Goal: Create a sustainable lighting system.

Why?

ECONOMY

Studies have linked light pollution to crime and negative health consequences, which harms productivity and the economy.

ENVIRONMENT

Light pollution hurts local ecosystems and wildlife.

EQUITY

Resolving light pollution helps citizens regardless of income or race- leading to a more equitable sustainable city.

Successes to Date:

3. Co-generation Wastewater Facility: The cogeneration facility installed at the City's wastewater treatment plant will help meet part of Frederick's ambitious renewable energy goal and the other options such as solar will help meet the remainder of that goal.

4. Energy Education: Although the program was developed through Frederick County, a three-part "Green Homes Challenge" was developed between 2010-4 where residents could become certified for residential energy efficiency (Frederick County n.d.). The certification program reduced and tracked such residential energy consumption and GHGs while providing incentive and rebate programs to increase energy efficient devices, retrofits, and residential renewable energy system installations. The program even created "Tupperware party" style Power Saver events to teach neighborhoods on how to reduce their own energy consumption.

Objective 1:

Implement a Dark Sky Compliant policy by (year)

Dark sky compliant lighting is the leading instrument for preventing harmful health, economic, and environmental effects of glare and lighting pollution.

Actions:

1. Adopt and enforce a dark sky ordinance

   Mid-term **Agency**: (INSERT APPROPRIATE AGENCY)

   Permitting Department should work with Code Enforcement and Street Lighting & Traffic Control Department

2. Educate and provide a guide to lighting options that comply to dark sky ordinance to local vendors, developers, home and business owners

   Mid-term **Agency**: (INSERT APPROPRIATE AGENCY)

Objective 2:

Upgrade (percentage) of aging lighting infrastructure by (year)

Upgrading lighting infrastructure is a direct way to bring the City energy savings, limit lighting pollution, and provide a more environmentally sustainable city.

Actions:

1. Continue replacement of aging street lights with the most efficient lighting options such as LED, CFL, and induction lighting.

   Ongoing **Agency**: (INSERT APPROPRIATE AGENCY)

   Department of Recreation and Parks should work with Department of Public Works, Street Lighting & Traffic Control Department

2. Mandate all new streetlights put in by new developments comply with the highest energy efficiency standards.

   Ongoing **Agency**: (INSERT APPROPRIATE AGENCY)

   Department of Recreation and Parks should work with Department of Public Works, Street Lighting & Traffic Control Department

Benchmarks:

- Begin annual public event with goals of increasing sponsorships and participation yearly.
- Participation by all major institutions and downtown businesses.

1 Goal: Create a sustainable lighting system.

Objective 3:

Expand "Lights out" programs to become a fixture in the city's culture by (year).

Lights Out programs are a leading way cities around the world educate the public about sustainable energy policy and decrease electricity usage by businesses.

Actions:

1. Adopt a "Lights Out" policy for all municipal buildings where lights are turned off after hours

   Short-term **Agency**: *(INSERT APPROPRIATE AGENCY)*

   Code Enforcement should work with Permitting Department, Street Lighting & Traffic Control Department

2. Organize a voluntary program to join a city-wide "Lights Out" policy for all businesses in the city.

   Short-term **Agency**: *(INSERT APPROPRIATE AGENCY)*

   Code Enforcement should work with Permitting Department, Street Lighting & Traffic Control Department

Potential Challenges with Goal 1:

City employees may be reluctant to participate in programs requiring them to walk or bicycle when such trips were previously permitted to be made by automobile. Outreach to employees discussing the benefits of these programs, as well as corresponding concessions to employees such as allowing telework and permitting them to forego parking privileges in exchange for the value of that benefit, will help to make these programs more appealing to employees.

Some City employees and employee supervisors may be cautious about implementing telecommuting programs, as they may fear that employees working remotely will be less productive. Research has shown that this is not the case, and that in some cases telecommuting actually improves productivity (Dutcher and Saral 2012, Ahmed, et al. 2014).

Benchmarks:

- Begin annual public event with goals of increasing sponsorships and participation yearly.
- Pass Dark Sky Ordinance with immediate effects on all new light purchases and retrofits.
- Participation by all major institutions and downtown businesses.
- Be a designated dark sky community by the International Dark Sky Association

2 Goal: Reduce Frederick City's private sector and residential energy demand.

Why?

ECONOMY

Local energy cost savings for residents could allow more saved income locally, which could see returns into the local economy.

ENVIRONMENT

Decreasing emissions from fossil fuels helps air quality and reduces global climate change.

EQUITY

Decreasing energy usage in Frederick per capita begins to adjust American energy consumption rates, which are significantly higher than most peer nations.

Potential Challenges with Goal 2:

Major businesses and corporations in the city may be resistant to implementing changes if seen as too costly at the onset and revealing their energy usage.

Lack of motivation and energy behind an Energy Commission could lead to ineffective coordination and implementation.

Objective 1:

Increase incentives and disincentives for green building standards, sustainable energy programs and energy sustainability by (percentage) by (year).

Local energy cost savings for Frederick residents could allow residents to spend more saved income locally, which could see returns into the local economy.

Actions:

1. Create an Energy Commission of City officials, major stakeholder companies and utilities, and citizens to empower change in the city.

   Mid-term **Agency**: *(INSERT APPROPRIATE AGENCY)*

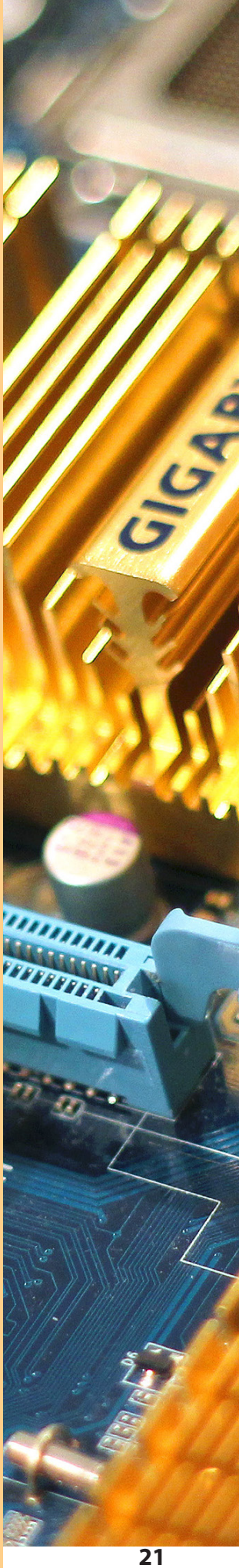
2. Prepare and implement an energy conservation plan for the city as a means of providing a resource guide on cost-effective energy saving measures.

   Mid-term **Agency**: *(INSERT APPROPRIATE AGENCY)*

   Public Works Department should work with the Planning Department

3. Investigate contracting with an Energy Service Company (ESCo) or work with the Solar City contract with Montgomery County to provide the city with energy efficiency upgrades at no up-front cost to the City and in such a way as to use the money saved through increased efficiency to fund renewable energy projects.

   Mid-term **Agency**: *(INSERT APPROPRIATE AGENCY)*



2 Goal: Reduce automobile dependency among city residents.

Objective 2:

Work with private enterprise in the city to decrease energy consumption by (percentage) by (year).

Decreasing emissions from fossil fuels helps air quality and reduces global climate change.

Actions:

1. Keep energy audits and operations audits of all private buildings over a certain size (City will decide), and keep current a list of all completed energy saving measures implemented and opportunities for future cost-effective energy upgrades in the private sector.

   Short-term **Agency**: (INSERT APPROPRIATE AGENCY)

   Facilities Administration should work with Building/Permits Department, Department of Planning, and Code Enforcement

2. Create a local law to requiring energy benchmarking via Energy Star Portfolio Manager for buildings over a specified size.

   Mid-term **Agency**: (INSERT APPROPRIATE AGENCY)

3. Create an awards program for improvements in energy efficiency for the built environment for private sector development.

   Short-term **Agency**: (INSERT APPROPRIATE AGENCY)

Objective 3:

The City will increase use of new energy technologies in (percentage of buildings) to continue to increase its energy efficiency by (year).

Decreasing energy usage in Frederick per capita begins to adjust American energy consumption rates, which are significantly higher than most peer developed nations.

Actions:

1. Research opportunities for the implementation of smart grid technologies for City-owned buildings.

   Public Words should work with Department of Purchasing and Planning Department

   Long-term **Agency**: (INSERT APPROPRIATE AGENCY)

3 Goal: Increase the proportion of energy sourced from clean and renewable supplies in the private sector and major institutions.

Why?

ECONOMY

Renewable energy investments typically strengthen the local economy and prevent brownouts- saving the money.

ENVIRONMENT

Renewable energy decreases the carbon footprint and limits the effects of global warming

EQUITY

A focus on renewable energy supports local workmanship, ensures a clean environment for everyone, and reduces reliance on foreign fuel sources.

Potential Challenges with Goal 2:

Major businesses and corporations in the city may be resistant to implementing changes if seen as too costly at the onset and revealing their energy usage.

Lack of motivation and energy behind an Energy Commission could lead to ineffective coordination and implementation.

Benchmarks:

- Comprehensive study of zoning complete by 2017, implemented as part of future master plans or small area plans
- First cooperative by 2018-2019

Objective 1:

Foster better regulation that will incentivize renewable energy usage by (year).

Renewable energy begins at the municipal level where planning offices can lead communities towards energy savings and green outcomes.

Actions:

1. Investigate and ease any possible restrictions to solar energy systems - particularly in historic and residential areas with community support.

   Short-term **Agency**: (INSERT APPROPRIATE AGENCY)

   Department of Planning should work with and Public Works and the Department of Economic.

2. Modify zoning ordinances to encourage combined heat and power systems and encourage adoption by major institutions and large corporate campuses with an emphasis on renewable combined systems.

   Mid-term **Agency**: (INSERT APPROPRIATE AGENCY)

   Department of Planning should work with and Public Works and the Department of Economic Development.

Objective 2:

Join peer cities across the region to make renewables (percentage) of energy supply by (year).

Zoning changes and regulatory changes may entice developers and communities towards using renewable energy but a concentrated series of partnerships and incentives by the City can make the green energy future possible.

Actions:

1. Identify opportunities for cost savings through neighborhood-scale renewable energy systems such as combined heat and power in the downtown area of Frederick

   Short-term **Agency**: (INSERT APPROPRIATE AGENCY)

   Public Works Department should work with Planning and Department of Economic Development.

2. Partner with Maryland-Sun to help create solar cooperatives through educational initiatives.

   Mid-term **Agency**: (INSERT APPROPRIATE AGENCY)

   Sustainability Coordinator should work with all agencies that participate in community outreach.

4 Goal: Increase the proportion of energy sourced from clean and renewable supplies in the private sector and major institutions.

Why?

ECONOMY

A modernized energy infrastructure can provide long term cost savings to residents, businesses, and the municipality

ENVIRONMENT

A more efficient and reliable energy infrastructure uses less electricity limiting the use of renewable sources, which can impede global climate change and help improve air quality.

EQUITY

Modernized energy infrastructure in all parts of the city can decrease brownouts and energy disruptions for all residents.

Potential Challenges with Goal 2:

Difficulty in coordination with local municipality companies

Cost to upgrade and implement smart grid technology and underground cables may be an impediment to implementation

Difficulty in coordinating with energy companies

Objective 1:

By 2035, reduce annual power outages to between 0 and 2 events of less than 100 minutes per year from Frederick's current rate.

Renewable energy begins at the municipal level where planning offices can lead communities towards energy savings and green outcomes.

Actions:

1. Encourage the expansion of locally produced renewable energy to reduce stress on the grid through energy partnership.

   Immediate — ***Agency**: (INSERT APPROPRIATE AGENCY)*

2. Require the installation of smart meters in all new construction

   Immediate — ***Agency**: (INSERT APPROPRIATE AGENCY)*

Objective 2:

Increase innovative energy infrastructure in (percentage) City-owned buildings by (year).

Actions:

1. Coordinate with utility provider to provide information about smart meters in existing buildings.

   Immediate — ***Agency**: (INSERT APPROPRIATE AGENCY)*

2. Investigate the undergrounding of cables to reduce susceptibility to outages in key areas throughout the city.

   Mid-term — ***Agency**: (INSERT APPROPRIATE AGENCY)*

5 Goal: Cultivate a sustainable workplace and City operations that maximizes use of renewables and uses energy efficiently.

Why?

ECONOMY

Increasing the City's facilities' energy efficiency eventually decreases energy costs to the City

ENVIRONMENT

Decreasing the city's energy consumption decreases the city's GHG emissions and helps to fight against global climate change as well as maintaining local ecosystems.

EQUITY

Sustainability, at the municipal level, can be a point of pride for employees, City officials, and the broader community. Saving energy, saves taxpayers money and allows more resources to be invested to those most in the community most in need.

Objective 1:

Require 100 percent of City employees participate in energy efficiency and sustainability training by (year).

Energy consumption and sustainability should be begin by example with the municipal staff. Cities like Flagstaff, Arizona and Washington, D.C. have made their operations greener and more efficient by starting with the way they work.

Actions:

1. Create incentive programs to have employees work in the City of Frederick to reduce greenhouse gas emissions on commute and allow work-from-home programs when appropriate to reduce carbon footprint.

   Short-term **Agency**: *(INSERT APPROPRIATE AGENCY)*

   - Sustainability Coordinator should work with Human Resources
   - See Transportation chapter for other vehicle energy policies

2. Include mandatory sustainability orientations – which include energy responsibility – as a requirement for all new employees- and require an evaluation of sustainability approach and effort in employee annual reviews.

   Short-term **Agency**: *(INSERT APPROPRIATE AGENCY)*

3. Creative incentive programs to use alternative green transportation options for employees (i.e. bicycle, bus, or walking).

   Short-term **Agency**: *(INSERT APPROPRIATE AGENCY)*

   See Transportation chapter for more details

4. Implement energy monitoring technology (down to the outlet) as well as motion sensors and weatherization programs within all municipal buildings.

   Ongoing **Agency**: *(INSERT APPROPRIATE AGENCY)*

   Sustainability Coordinator should work with the Department of Public Works

5 Goal: Cultivate a sustainable workplace and City operations that maximizes use of renewables and uses energy efficiently.

Objective 2:

Upgrade (percentage) of City facilities to be more energy efficient and use renewable energy by (year).

Energy efficiency begins at the level of the outlet- to make City buildings more efficient the City should look at a wide variety of upgrades from sensor technology in buildings to solar farms.

Actions:

1. Implement energy monitoring technology (down to the outlet) as well as motion sensors and weatherization programs within all municipal buildings.

   Mid-term **Agency**: *(INSERT APPROPRIATE AGENCY)*

2. Install solar panel infrastructure using rental programs or purchase programs to all municipal buildings.

   Mid-term **Agency**: *(INSERT APPROPRIATE AGENCY)*

   Sustainability Coordinator should work with Facilities Manager and Public Works

3. Explore solar at the Frederick Municipal Airport and the conversion of other municipally owned or vacant lots into solar or wind farms.

   Ongoing **Agency**: *(INSERT APPROPRIATE AGENCY)*

   Planning should work with the Sustainability Coordinator and the Engineering Department

4. Conduct energy audits on all City buildings

   Short-term **Agency**: *(INSERT APPROPRIATE AGENCY)*

   Refer to analysis for energy audit options

5. In all future contracts, require all suppliers selling energy to the City to use renewable energy as a part of their portfolio

   Ongoing **Agency**: *(INSERT APPROPRIATE AGENCY)*

   Code Enforcement should work with Permitting Department, Street Lighting & Traffic Control Department

ENERGY SOLUTIONS ANALYSIS

The following pages are in-depth analyses of each goal and objective - detailing case studies, best practices, and implementation methods. It is meant to be supplementary material that can guide Frederick.

GOAL ONE | OBJECTIVE ONE - TWO:

1) Implement Dark Sky compliant lighting by (year).
2) Upgrade (percentage) of aging lighting infrastructure by (year).

CASE STUDY:
Aurora, CO

Cities like Aurora, Colorado tackled conversion to dark sky compliant fixtures as a gradually process while updating existing lighting, installing new lighting, and targeting specific areas (like nature preserves or zoos) instead of comprehensively trying to upgrade the system.

GOAL ONE:

Create a sustainable lighting system.

Light pollution and upgrades to street lighting are a critically important part of energy sustainability goals. In terms of the environment, light pollution causes harm to local animal and plant ecosystems, encourages increased energy usage, and even can have demonstrated effects on human health and causes crime. Studies also suggest that artificial night lighting has negative effects on a wide range of wildlife, including amphibians, birds, mammals, insects and even plants (Gaston, Bennie and Davie 2013). Ecological light pollution disorients migratory birds, disrupts mating behavior of frogs and interferes with predatory/prey relationships (Longcore and Rich n.d.). Since the eyes of nocturnal animals have evolved for foraging in low-light conditions, unexpected changes in illumination can alter their relationship with prey species (Longcore and Rich n.d.). Light fixation is also a bird hazard that kills thousands of birds in urban areas every year (Gaston, Bennie and Davie 2013). Smithsonian Migratory Bird Center researchers analyzed data from 23 cities estimating 365 to 988 million birds are killed each year in the U.S. due to light pollution (Audobon 2015).

Reducing light pollution and upgrading streetlights is also an imperative in terms of sustainable economic policy. The 24 –hour day/night cycle, known as the circadian clock, affects physiologic processes in people- harming the health and economic output of cities. Studies show disruption of these rhythms can result in insomnia, depression and cardiovascular disease (Chepesiuk 2009). In June 2009, the American Medical Association adopted resolutions that support reducing light pollution and glare and advocate for use of fully shielded outdoor lighting - noting that "older citizens are significantly affected by glare as the eye ages, leading to unsafe driving conditions" and "strongly suspected as an etiology of suppressed melatonin production, depressed immune systems, and increase in cancer rates such as breast cancers" (American Medical Association House of Delegates 2009). In terms of energy savings, approximately 30 percent to 40 percent of energy produced by unshielded bulbs is used to illuminate the sky (IDSA n.d.) (American Medical Association House of Delegates 2009). This wasted energy costs $2.2 billion annually in the United States alone (American Medical Association House of Delegates 2009). Practical solutions from motion sensors on outdoor lighting, timers, dimers, or using lower-watt bulbs can save cities money. When lighting is used only where needed, money that would otherwise be spent on the electric bill can instead be spent on other things, which is good for property owners and good for the economy. Upgrading street lighting to LED or other energy efficient alternatives will ultimately save the city money. Streetlights currently make up about 25 percent of the City's overall energy usage and could help save the city money.

Brighter light does not necessarily mean safety to residents and businesses. Bright, glaring lights that illuminate nighttime events or locations can actually decrease the security of the sites (Light Pollution and Safety: Real Security with Good Lighting 2008). Excessively

bright lighting can create a sharp contrast between light and darkness, making the area outside the light nearly impossible to see (Light Pollution and Safety: Real Security with Good Lighting 2008). Most property crime is still committed during the day, or inside lit buildings (Light Pollution and Safety: Real Security with Good Lighting 2008). A safe environment involves shielding lighting for roadways, parking lots, homes, businesses and landscapes, increasing visibility and decreasing distractions, such as glare (Light Pollution and Safety: Real Security with Good Lighting 2008). These health, economic, and environmental improvements can be part of making the city more equitable. Everyone is affected by light pollution- providing adequate lighting across the city will help citizens regardless of race, income, or geographic location. Adequate, targeted lighting in poorer neighborhoods can improve health and possibly reduce crime - helping enhance those neighborhoods (Sherman, et al. 1997).

Environmental scientists, biologists, astronomers, and other advocates have formed the International Dark Sky Association (IDSA) to advocate for better dark sky policies. They certify and advise individuals as well as cities on proper lighting to address light pollution. Several city governments- from Flagstaff, Arizona to Dripping Springs, Texas have used their code recommendations and certification as a means of implementation. See Appendix B for more information.

O-1:
Dark sky ordinances are the leading way cities around the world are combatting the harmful effects of light pollution. From Flagstaff, Arizona to Dripping Springs, Texas, cities have become "dark sky communities" meaning a team of astronomers, scientists, and planners have certified that the city has returned to nearly zero light pollution. Frederick, its move to make a more sustainable future should join these cities and become a leader in the region. Resistance to dark sky policies typically come due to a lack of education about the variety of positive outcomes of the ordinances and misconceptions about public safety. It is also sometimes difficult to implement due to procurement practices. Cities like Aurora, Colorado tackled conversion to dark sky compliant fixtures as a gradually process while updating existing lighting, installing new lighting, and targeting specific areas (like nature preserves or zoos) instead of comprehensively trying to upgrade the system. As dark sky compliant fixtures are typically more energy efficient, tracking of the number of new systems that use dark sky systems and estimating the savings is a valuable measurement that can bolster support for the possible financial difficulties in implementation. See Appendix B.1 for standards, and B.2 for case study.

O-2:
In an effort to save the City money and make the city more sustainable, the City of Frederick already has made great strides in upgrading its energy infrastructure by replacing lighting to more efficient LED and CFL systems. Frederick should build on its success in this area as it moves to a more sustainable energy future. Note that CFL's like common florescent lighting contains mercury, while LED's contain lead and arsenic (Lim, et al. 2011). Any decision to use them needs to consider proper recycling to avoid pollution. Most cities have not made the changes comprehensively; instead they mandate all new streetlights be installed in only new developments or parts of upgrades with the highest energy efficiency standards.

The primary impediment to upgrades is the financial costs. Other cities that have upgraded their lighting systems partnered with local energy agencies and state energy agencies to offset costs of implementation. CFL and LED manufacturers often have programs that can help in offsetting the cost. Many are willing to help finance these projects by accepting payments over several years or procured over a long time period. Given this, it is advisable to ask the manufacturers about their programs and possibly include these terms in the bid documents. A number of large energy service companies (ESCO's) are also offering complete turnkey installation programs.

GOAL ONE | OBJECTIVE TWO - THREE:

2) Upgrade (percentage) of aging lighting infrastructure by (year).
3) Expand "Lights out" programs to become a fixture in the city's culture by (year).

CASE STUDY:
Evanston, IL

The City of Evanston, Illinois – a City of 75,000 people- was recognized as a 2015 Earth Hour Capital by the WWF standing with the ranks of Seattle and Chicago demonstrating that even small communities can take on such huge sustainability challenges (Evanston, IL, Named 2015 US Earth Hour Capital 2015). They were able to do the program with creating a robust sustainability program and partnering with major businesses and institutions on implementation (Evanston, IL, Named 2015 US Earth Hour Capital 2015).

They can finance the project as well as purchase and install the lights. The City can pay for this over many years out of energy and maintenance savings as well as any potential energy rebates. The state of Maryland also has a variety of grants programs through Maryland Energy Administration that can help in implementation. Tracking of new systems and estimating cost savings can be a key metric to justify implementation of the program and understand the sustainable results.

O-3:
Lights Out programs are a leading way cities around the world educate the public about sustainable energy policy and decrease electricity usage by businesses. Frederick already participates in Earth Hour and should continue to expand and strengthen involvement in lights out programming and energy savings movements. Energy savings truly begin at the level of the light switch and public consciousness can galvanize support for broader sustainable policies and create savings for residents and businesses. The City can expand its program and begin immediately by ensuring a "Lights Out" policy for all municipal buildings where lights are turned off after hours. This city-only program could be organized to create a voluntary program to join a city-wide "lights out" policy for all businesses in the city. To entice large businesses, participants could be promoted for their efforts in annual Earth Hour celebrations and promotional materials on banners, public events, or other municipal events. Challenges to cities include – like many movements toward sustainable lighting – local resistance due to lack of education about savings and environmental importance of "Light's Out" programming and the misguided conception that "lights out" means more crime.

Typical partners for lights out programs are local energy companies and environmental groups. In the case of Frederick, potential partners could include Frederick Bird Club, Central Maryland Audubon Society, Empower Energy, Frederick Chamber of Commerce, and the Downtown Frederick Partnership and the City of Frederick Police Department. National and international groups which partners with communities include Earth Hour and the World Wildlife Foundation- which help in implementing crowdfunding and promoting the city's efforts.

GOAL ONE:

Create a sustainable lighting system.

GOAL TWO | OBJECTIVE ONE - THREE:

1) Increase incentives and disincentives for green building standards, sustainable energy programs and energy sustainability by (percentage) by (year).

CASE STUDY:
Berkeley, CA

In 1976, the City of Berkeley established an energy commission that was comprised of seven members appointed by the mayor's office to advise the Board of Aldermen on climate protection, energy conservation and alternative energy development (City of Berkeley n.d.).

Although the City of Frederick can and should be an energy efficiency role model independently, both the private sector and local residents should also do their respective parts to curb energy consumption as reducing energy consumption has its benefits. Economically, local energy cost savings for Frederick residents could allow residents to spend more saved income locally, which could see returns into the local economy (Spurring Local Economic Development with Clean Energy Investments: Lessons from the Field 2013). In addition, local spending on energy retrofitting projects has the potential to further support local contractors and building suppliers.

In environmental terms, decreasing emissions from fossil fuels in Frederick helps air quality and reduces global climate change, while decreasing energy usage in Frederick per capita begins to adjust American energy consumption rates, which are significantly higher than most peer developed nations, to match closer to those of other world nations (U.S. Energy Information Administration n.d.), and therefore establishes more equitable distributions of the world population's energy supply.

O-1:
Focusing on energy sustainability as foundation of enterprise through the mandating of green building standards and sustainable energy programs helps to support the City's goal of reducing private sector and residential energy demand. To implement this objective, the City must follow through on key actions such as establishing an Energy Commission. This commission must include City officials, major stakeholder companies and utilities, and citizens to empower change in the city. This Commission should have the ability to assist in implementing and keeping the community focus on the energy goals of this plan, including collecting data, proactively examining alternative, renewable, and sustainable energy options (i.e. solar, vegetable oil and biodiesel options, methane digester power, and landfill gas generation). One city that has implemented such a commission to great success is the Berkeley, CA.

Another action that the City should implement is an energy conservation plan for the city as a means of providing a resource guide on cost-effective energy saving measures. In order to better coordinate such a plan, the City should invite and engage with its local utilities to collaborate on the plan. In addition to creating an energy conservation plan, the City should investigate contracting with an Energy Service Company (ESCo) or work with the Solar City contract with Montgomery County to provide the City with energy efficiency upgrades at no up-front cost and in such a way as to use the money saved through increased efficiency to fund renewable energy projects.

O-2:
In order for the City to create energy benchmarks and monitor the city's private sector energy consumption, Frederick

GOAL TWO:

Reduce Frederick City's Private Sector and Residential Energy Demand.

2) Work with private enterprise in the city to decrease energy consumption by (percentage) by (year).

3) The City will increase use of new energy technologies in (percentage of buildings) to continue to increase its energy efficiency by (year).

"making the data publicly available act to promote the businesses that follow the standards."

must keep energy audits and operations audits of all private buildings over a certain size (City will decide), and keep current a list of all completed energy saving measures implemented and opportunities for future cost-effective energy upgrades in the private sector. To better enforce this, the City should create a local law to require energy benchmarking via Energy Star Portfolio Manager for buildings over a specified size (City will decide). New York City has successfully implemented various laws (Local Law 84, 85, 87 and 88) that require that all large buildings annually benchmark their energy performance, that every 10 years these buildings conduct an energy audit and retro-commissioning, that by 2025, the lighting in non-residential spaces be upgraded to meet code and large commercial tenants be provided with sub-meters, and that all of this data is made publicly available (New York City Council 2009).

While some of these laws may sound strict, requiring private companies to achieve such energy standards and making the data publicly available act to promote the businesses that follow the standards. Further, creating an awards program for improvements in energy efficiency for the built environment for private sector development would further enhance such publicity and promotion while also displaying the City of Frederick as actively energy conscious.

O-3:
Reducing energy consumption in Frederick is only one component of the energy reduction equation. Therefore, research opportunities for the implementation of smart grid technologies as well as other new technologies should be promoted within the City's administration. This can be especially helpful when Frederick must renew or change its energy provider contract.

GOAL THREE | OBJECTIVE ONE - TWO:

1) Foster better regulation that will incentivize renewable energy usage by (year).

CASE STUDY:
Rockville, MD

With help from the City of Rockville, Homeowners in Rockville formed a solar co-op! Co-op members used their collective buying power to get a discounted price for solar panels (Rockville Solar Co-op 2015).

A noticeably cleaner, greener Frederick can only be achieved by involving major institutions, residents, and the private sector. Economically, renewable energy investments are typically spent within same county, state or town – stimulating the local economy, spurring higher tax revenue, and increasing economic competitiveness in cities (Spurring Local Economic Development with Clean Energy Investments: Lessons from the Field 2013). Furthermore, diversifying and making more renewable sources of energy can foster increased resiliency for brownouts – helping keep the economy of Frederick productive (Spurring Local Economic Development with Clean Energy Investments: Lessons from the Field 2013). Investments in energy pay off in creating a better economy for the city. Environmentally, limiting energy usage is one of the key strategies in decreases the carbon footprint and limits the effects of global warming.

Lastly, focusing on clean energy has positive equitable outcomes for the city as well. A focus on renewable energy investments can support local materials and workmanship the – bolstering working class and professional jobs (Spurring Local Economic Development with Clean Energy Investments: Lessons from the Field 2013). Moreover, renewable sources ensure clean air for everyone – regardless of income or geography. Lastly, renewable energy can be part of a broader national political movement to reduce reliance on foreign fossil fuels sourced from potentially unstable countries and focus on promoting the American economy.

O-1:
Fostering zoning or building codes that encourage renewable energy usage can be the first and most important step to renewables becoming a fabric of the city. The most difficult zoning and regulations to change are usually restrictions to solar systems in historic and home owners associations. The City needs to be mindful of this and take a leadership role in educating these areas and working to implement balanced zoning that can allow usage without creating community tension or harming historic structures. Oftentimes, these zoning investigations are done in concert with new comprehensive plans.

The City can also encourage adoption by major institutions and large corporate campuses to combine heat and power systems. It's important to note that combined heating and power systems can use geothermal, solar, heat pumps, or other means to share heat between facilities- that does not just rely on greenhouse gas emitting power plants. Simultaneous production through combined heat and power is more efficient than producing electricity and thermal energy through two separate power systems and requires less fuel. This reduction in fuel use can produce a number of benefits, including energy cost savings, reduced GHG emissions, and reductions in other air emissions (Environmental Protection Agency 2014).

Boston, Massachusetts, adopted a Green Building Ordinance in January 2007 that applies to new public and private buildings of 50,000 square feet or greater (Environmental

GOAL THREE:

Increase the proportion of energy sourced from clean and renewable supplies in the private sector and major institutions.

Protection Agency 2014). To encourage CHP, the city included an additional provision awarding one credit point toward LEED certification for buildings drawing 10 percent of their total energy use from CHP systems (Environmental Protection Agency 2014).

O-2:
The City of Frederick can join peer cities across the region to make renewables 50 percent of their energy supply by 2035. Washington, DC has made it its goal to make generate or purchase (or a combination of the two) 50 percent of their energy supply. The state of Maryland has a current goal of toward 20 percent renewable energy production by 2022 and communities like Annapolis have set energy goals of carbon neutrality by 2050 (Maryland Energy Administration n.d.). This can be achieved through a variety of ways including the aforementioned upgrades to lighting systems but also through programs that offset the cost of installing solar, wind, geothermal heating and cooling, bioenergy, and other renewable energy systems.

Besides the clear environmental benefits of making this ambitious goal, it also can help support economic development. To spur economic development and encourage green energy use in the downtown, the City of West Union, Iowa - with a population of just 2,500 - put a geothermal combined heat and power system underneath their town square.

The City can also help support citizen initiatives to bring solar power to the city. Maryland-Sun, a local advocacy organization, has helped to create solar cooperatives through educational initiatives and organizing in Prince George's County, Chestertown, Rockville, and other counties and municipalities. Given the experience of these local municipalities, the City of Frederick could implement its first solar cooperative within a year of partnering with them. These cooperatives have not only expanded knowledge to citizens but in cities like Washington, DC have become wildly popular and even led to legislation to bring solar incentives to low income households.
The City of West Union, Iowa - with a population of just 2,500 - put a geothermal combined heat and power system underneath their town square (Uhlenhuth 2014). The system cut energy costs for the businesses by ⅔ and was entirely financed through EPA grants, local in kind donations, and state financing (Uhlenhuth 2014). Frederick should explore possible alternative energy options and look to funding from the state of Maryland as well as the financing program of the EPA to achieve this goal (Maryland Energy Administration n.d.)

GOAL FOUR | OBJECTIVE ONE - TWO:

1) By 2035, reduce annual power outages to between 0 and 2 events of less than 100 minutes per year from Frederick's current rate.

CASE STUDY:
Boston, MA

Boston, Massachusetts, adopted a Green Building Ordinance in January 2007 that applies to new public and private buildings of 50,000 square feet or greater (Environmental Protection Agency 2014). To encourage CHP, the city included an additional provision awarding one credit point toward LEED certification for buildings drawing 10 percent of their total energy use from CHP systems (Environmental Protection Agency 2014).

Embracing energy sourced from clean and renewable supplies in the private sector and major institutions is healthy for the City of Frederick for many reasons. Economically, a modernized energy infrastructure can provide long term cost savings to residents, businesses, and the municipality. Environmentally, a more efficient and reliable energy infrastructure uses less electricity limiting the use of renewable sources which can impede global climate change and help improve air quality. In terms of equity, a modernized energy infrastructure in all parts of the city can decrease brownouts and energy disruptions for all residents.

O-1:
To achieve the objective of reducing annual power outages in the City of Frederick, the City administration must encourage the expansion of locally produced renewable energy to reduce stress on the grid through energy partnerships with local energy companies such as Solar City or state programs like EmPOWER Maryland. The appropriate responsible agencies to address this action are the Department of Planning, Department of Public Works and the Department of Economic Development. The timeframe for implementing this actions is immediate.

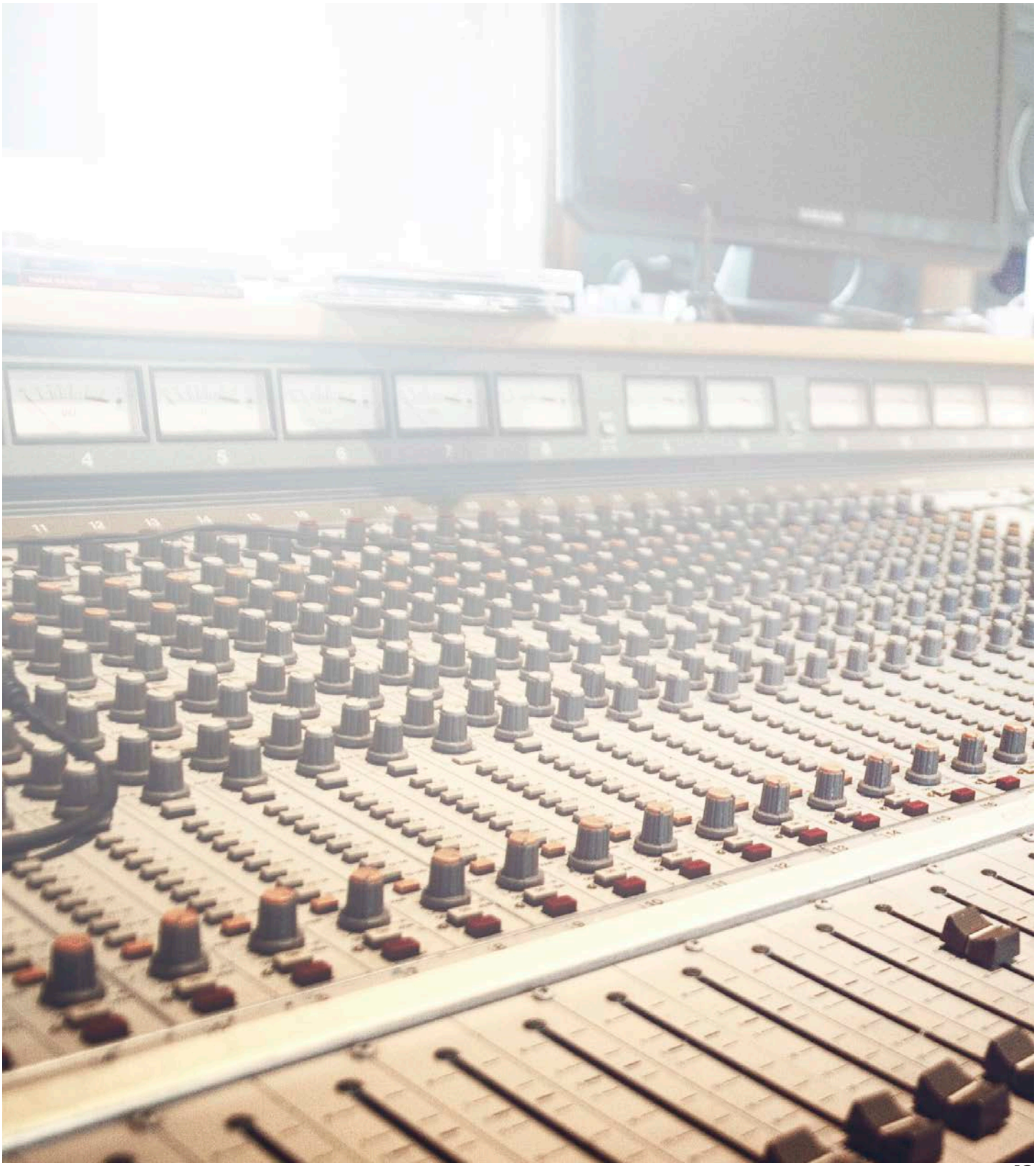
In order to truly take advantage of new renewable energy expansion within Frederick, the City must require the installation of smart meters in all new construction as to make sure that new renewable energy entering the electric grid within Frederick can be stored in plethora of places, or that Frederick's energy supply can be regulated more strictly as to reduce as much energy waste as possible. The appropriate responsible agencies to implement this action are the Department of Planning and the Department of Public Works. The appropriate timeline for implementing this action is immediate, seeing that all new construction can currently be built with the integration of smart meters.

O-2:
While it may be relatively easy to build new building with smart meters integrated, it can be much more complicated to install smart meters on pre-existing housing/building stock. This is especially true for homeowners living in historic or older homes with antiquated electrical wiring. Nonetheless, the City of Frederick should attempt to at least coordinate with the local utility provider to provide information about smart meters in existing buildings. The appropriate responsible agency to initiate the action is the Department of Planning and Public Works. The timeline is deemed "immediate."

GOAL THREE:

Increase the proportion of energy sourced from clean and renewable supplies in the private sector and major institutions.

2) Increase innovative energy infrastructure in (percentage) City-owned buildings by (year).



GOAL FIVE | OBJECTIVE ONE - TWO:

1) Require 100 percent of City employees participate in energy efficiency and sustainability training by (year).

CASE STUDY:
Rockville, MD

Re-Imagining a More Sustainable Cleveland, led by Neighborhood Progress, Inc., a community development intermediary, in collaboration with the Cleveland City Planning Commission and Kent State University's Cleveland Land Lab, with funding from the Surdna Foundation. The goal of the planning process was to explore reuse strategies for vacant parcels located outside of the priority development areas identified in the City's comprehensive plan. The final report includes a discussion of the benefits of reusing vacant land for solar installations along with policy recommendations to incentivize the generation and use of renewable energy (Recycling Land for Solar Energy Development n.d.).

GOAL THREE:

Cultivate a sustainable workplace and city operations that maximizes use of renewables and uses energy efficiently.

While it may be relatively easy to build new building with smart meters integrated, it can be much more complicated to install smart meters on pre-existing housing/building stock. This is especially true for homeowners living in historic or older homes with antiquated electrical wiring. Nonetheless, the City of Frederick should attempt to at least coordinate with the local utility provider to provide information about smart meters in existing buildings. The appropriate responsible agency to initiate the action is the Department of Planning and Public Works. The timeline is deemed "immediate."

While undergrounding electrical lines can be cost-prohibitive in many cases, moving electrical lines underground do make a significant difference in terms of decreasing opportunities for trees or other objects to take down above ground power lines during storms. In order to continue to reduce instances of power outages in Frederick, the City should investigate with its local electrical utility company about the undergrounding of cables to reduce susceptibility to outages in key areas throughout the city. The District of Columbia and its local electrical utility, PEPCO, has begun to administer a similar power line undergrounding program in key areas that are prone to outages throughout the city. The program is called the PEPCO DC Plug (District of Columbia Power Line Undergrounding n.d.). The appropriate responsible agency to implement this action is the Department of Public Works. The timeframe to implement this action is deemed medium to long-term.

O-1:
Reducing energy consumption is the first steps to making municipal operations more green and efficient. Reducing energy consumption needs to begin at the operations level to be successful. Several cities of similar size to Frederick have created incentive programs to have employees work in the City of Frederick to reduce greenhouse gas emissions on commute and allow work-from-home programs when appropriate to reduce carbon footprint - see transportation section for more details. The City can track the estimated energy savings from employees living closer to work or working from home to help substantiate and track sustainability success. They have also included mandatory sustainability orientations- which include energy responsibility- as a requirement for all new employees- and require an evaluation of sustainability approach and effort in employee annual reviews (Haugh and Talwar 2010). Many municipalities have also created incentive programs to use alternative green transportation options for employees (i.e. bicycle, bus, or walking).

Beyond changes in operations, the City should make a goal to decrease energy usage at City facilities by 15 percent within 5 years following the State's

2) Upgrade (percentage) of City facilities to be more energy efficient and use renewable energy by (year).

Maryland Smart Energy Communities Initiatives (Maryland Smart Energy Communities: Guidelines and Resources for Energy Efficiency Policy 2014). Cities like New York City and many green interested companies have implement energy monitoring technology (down to the outlet) as well as motion sensors and weatherization programs within all municipal buildings. While monitoring electricity usage helps to assist in determining energy wastefulness, studies have shown that when individuals who are tracked based on electrical usage have increased awareness of their energy consumption and are more likely to decrease their energy use (The Hawthorne Effect and Energy Awareness 2013). The City can begin to implement these weatherization and energy infrastructure improvements in their buildings gradually and with renovation projects to offset costs. Companies like Budderfly offer services to cities to implement software and energy management solutions and provide cost estimates of the savings. Funding is available through Maryland Energy Administration and block grants. Cities like in their Flagstaff's 2013-4 Fiscal Year Municipal Sustainability Plan, aimed to monitor employees' energy use habits to promote energy assumption awareness (City of Flagstaff 2013).

The City should also explore installing solar panel infrastructure using rental programs or purchase programs to all municipal buildings either through existing contract between SolarCity and Montgomery County or through bidding from other installers to try to avoid any upfront costs. Energy rental programs are free with federal and state tax credits being transferred to the installer. Municipal purchased energy requires an initial investment offset but can be offset by tax credits and make the City money after years of usage.

The City should also explore vacant buildings and lots in the city where large scale solar would make a huge impact - particularly the Frederick Municipal Airport Solar installations at airports around the country have enabled municipalities to lower energy costs for airport buildings and lighting. The airport's unique situation can prompt City staff to separate it from other potential projects in the remainder of the city. The federal aviation administration has in the past offered grants to offset upgrading costs.

O-2:
The most important steps towards sustainability is by increasing efficiency of the built environment. The first step to know what to resolve is to conduct energy audits on all City-owned buildings. This will help prioritize additional projects that could help further reduce energy costs and the city's carbon footprint. Using a variety of energy audit software and even just utility bill changes, the City can track estimated monetary savings from upgrading facilities. Energy audits can be financed through block grants, financing from the Maryland Energy Administration.

Lastly, in all future energy contracts, the City should aim to require all suppliers selling energy to the city to use renewable energy as a part of their portfolio. This is a crucial step because, simply sourcing the energy from a more renewable source will ultimately be where the city receives a significant portion of its energy.

GOALS, OBJECTIVES AND ACTIONS SUMMARY TABLE

Goal 1: Create a sustainable lighting system	
Objective 1: Implement a Dark Sky Compliant policy by (year)	
1.1.1	Adopt and enforce a dark sky ordinance
1.1.2	Educate and provide a guide to lighting options that comply to dark sky ordinance to local vendors, developers, home and business
Objective 2 : Upgrade (percentage) of Aging Lighting Infrastructure by (year)	
1.2.1	Continue replacement of aging street lights with the most efficient lighting options such as LED, CFL, and induction lighting.
1.2.2	Mandate all new streetlights put in by new developments comply with the highest energy efficiency standards.
Objective 3 : Expand "Lights out" Programs to Become a Fixture in the City's Culture by (year)	
1.3.1	Adopt a "Lights Out" policy for all municipal buildings where lights are turned off after hours
1.3.2	Organize a voluntary program to join a citywide "lights out" policy for all businesses in the city.
Goal 2: Reduce Frederick City's Private Sector and Residential Energy Demand.	
Objective 1: Increase incentives and disincentives for green building standards, sustainable energy programs and energy sustainability by (perce	
2.1.1	Create an Energy Commission of city officials, major stakeholder companies and utilities, and citizens to empower change in the Cit
2.1.2	Prepare and implement an energy conservation plan for the city as a means of providing a resource guide on cost-effective energy
2.1.3	Investigate contracting with an Energy Service Company (ESCo) or work with the Solar City contract with Montgomery County
Objective 2 : Work with private enterprise in the City to decrease energy consumption by (percentage) by (year.)	
2.2.1	Keep energy audits and operations audits of all private buildings over a certain size (City will decide)
2.2.2	Create a local law to requiring energy benchmarking via Energy Star Portfolio Manager for buildings over a specified size.
2.2.3	Create an awards program for improvements in energy efficiency for the built environment for private sector development.
Objective 3 : The City will increase use of new energy technologies in (percentage of buildings) to continue to increase its energy efficiency by (y	
2.3.1	Research opportunities for the implementation of smart grid technologies for City-owned buildings.
Goal 3: Increase the proportion of energy sourced from clean and renewable supplies in the private sector and major institutions.	
Objective 1: Foster better regulation that will incentivize renewable energy usage by (year).	
3.1.1	Investigate and ease any possible restrictions to solar systems - particularly in historic and residential areas with community suppor
3.1.2	Modify zoning ordinances to encourage combined heat and power systems and encourage adoption by major institutions and large
Objective 2 : Join peer cities across the region to increase the use of renewable energy to make up (percentage) of energy supply by (year).	
3.2.1	Identify opportunities for cost savings through neighborhood-scale renewable energy systems such as combined heat and power i
3.2.2	Partner with Maryland-Sun to help create solar cooperatives through educational initiatives.

	TIMEFRAME	LEAD AGENCY
	Mid-term	(INSERT APPROPRIATE AGENCY)
s owners	Mid-term	(INSERT APPROPRIATE AGENCY)
	Ongoing	(INSERT APPROPRIATE AGENCY)
	Ongoing	(INSERT APPROPRIATE AGENCY)
	Short-term	(INSERT APPROPRIATE AGENCY)
	Short-term	(INSERT APPROPRIATE AGENCY)
ntage) by (year.)		
y.	Mid-term	(INSERT APPROPRIATE AGENCY)
saving measures.	Mid-term	(INSERT APPROPRIATE AGENCY)
	Mid-term	(INSERT APPROPRIATE AGENCY)
	Short-term	(INSERT APPROPRIATE AGENCY)
	Mid-term	(INSERT APPROPRIATE AGENCY)
	Short-term	(INSERT APPROPRIATE AGENCY)
ear.)		
	Long-term	(INSERT APPROPRIATE AGENCY)
t.	Mid-term	(INSERT APPROPRIATE AGENCY)
e corporate campuses	Mid-term	(INSERT APPROPRIATE AGENCY)
n the downtown area of Frederick	Short-term	(INSERT APPROPRIATE AGENCY)
	Mid-term	(INSERT APPROPRIATE AGENCY)

GOALS, OBJECTIVES AND ACTIONS SUMMARY TABLE

Goal 4: Increase the proportion of energy sourced from clean and renewable supplies in the private sector and major institutions.	
Objective 1: By 2035, reduce annual power outages to between 0 and 2 events of less than 100 minutes per year from Frederick's current rate.	
4.1.1	Encourage the expansion of locally produced renewable energy to reduce stress on the grid through energy partnership.
4.1.2	Require the installation of smart meters in all new construction
Objective 2 : Increase innovative energy infrastructure in (percentage) City-owned buildings by (year.)	
4.2.1	Coordinate with utility provider to provide information about smart meters in existing buildings.
4.2.2	Investigate the undergrounding of cables to reduce susceptibility to outages in key areas throughout the City.
Goal 5: Cultivate a sustainable workplace and City operations that maximizes use of renewables and uses energy efficiently	
Objective 1: Require 100% of City employees participate in energy efficiency and sustainability training by (year).	
5.1.1	Create incentive programs to have employees work in the City of Frederick to reduce greenhouse gas emissions on commute and a
5.1.2	Include mandatory sustainability orientations – which include energy responsibility – as a requirement for all new employees.
5.1.3	Creative incentive programs to use alternative green transportation options for employees (i.e. bicycle, bus, or walking).
5.1.4	Implement energy monitoring technology (down to the outlet) as well as motion sensors and weatherization programs within all m
Objective 2 : Upgrade (percentage) of City facilities to be more energy efficient and use renewable energy by (year.)	
5.2.1	Implement energy monitoring technology (down to the outlet) as well as motion sensors and weatherization programs within all m
5.2.2	Install solar panel infrastructure using rental programs or purchase programs to all municipal buildings.
5.2.3	Explore solar at the Frederick Municipal Airport and the conversion of other municipally owned or vacant lots into solar or wind farm
5.2.4	Conduct energy audits on all City buildings.
5.2.5	In all future contracts, require all suppliers selling energy to the City to use renewable energy as a part of their portfolio.

	Immediate	(INSERT APPROPRIATE AGENCY)
	Immediate	(INSERT APPROPRIATE AGENCY)
	Immediate	(INSERT APPROPRIATE AGENCY)
	Mid-term	(INSERT APPROPRIATE AGENCY)
llow work-from-home programs when appropriate	Short-term	(INSERT APPROPRIATE AGENCY)
	Short-term	(INSERT APPROPRIATE AGENCY)
	Short-term	(INSERT APPROPRIATE AGENCY)
unicipal buildings.	Immediate	(INSERT APPROPRIATE AGENCY)
unicipal buildings.	Mid-term	(INSERT APPROPRIATE AGENCY)
	Mid-term	(INSERT APPROPRIATE AGENCY)
ms.	Ongoing	(INSERT APPROPRIATE AGENCY)
	Short-term	(INSERT APPROPRIATE AGENCY)
	Ongoing	(INSERT APPROPRIATE AGENCY)

2 | Water Quality

Introduction

Goals:

1. Safeguard and improve the quality of the city's watersheds to ensure clean, safe water for drinking, public recreation, healthy ecosystems and wildlife habitats.

2. Minimize the impact of the City of Frederick's infrastructure systems and impervious surfaces on water resources.

3. Protect valuable and sensitive ecological resources from water pollution.

As Frederick continues to grow it is important for the City to plan for and accommodate that growth in a manner that is ecologically responsible to provide for the water needs of its population and do its part in the recovery of the Chesapeake Bay. Approaching water challenges with current best management practices has many potential benefits for Frederick. It can highlight the community's strong ties to its beautiful adjacent park lands that are a regional draw for tourism and recreation. It can attract and support eco-friendly, water smart industries that can strengthen and diversify local job opportunities. It can beautify the city and improve property values and quality of life. It can help provide a framework that will allow Frederick to accommodate growth without overtaxing its water supply.

The City of Frederick's 2015 Capital Improvement Plan includes several projects that will help ensure a continuing supply of clean water. These include sharing the costs of County water infrastructure improvements—to allow the County to supply up to 8 million gallons per day (MGD) of water to the city—as well as the construction of water, sewer and stormwater infrastructure within the city. In addition, the CIP includes continuing funding for a program to reduce leaks and water losses within the distribution system. These projects will allow the city to meet its water needs according to the growth scenario adopted in the City's Comprehensive Plan.

The City has engaged in the purchase of land – Fishing Creek Reservoir – within its watershed so as to protect the water supply, and has money allocated to continue maintenance. The City's establishment of a minimum 50-foot stream buffer helps protect this valuable natural resource. For residents, businesses, and developers who address stormwater through various environmental site designs (ESDs), the City offers a stormwater management utility fee credit, dependent upon the impervious area and method of addressing the stormwater. (City Code Section 28-31(e)-(g)). The City of Frederick has also created an AD HOC Watershed Advisory Committee to establish a recreational network that supports water quality and water supply goals in the City of Frederick Watershed for Fishing Creek Reservoir and Fishing Creek. Yet, with all of its accomplishments, the City can do more to further insure the ongoing availability and quality of its water.

As Maryland is currently in violation of the EPA's clean water act – requiring all states, by federal law, to do more to ensure cleaner waterways and allow our bays and rivers to recover from the negative ecological and economic impacts of years of pollution – Frederick is in an ideal position to become a leader in smart sustainable water use, industry and municipal management.

1 Goal: Safeguard and improve the quality of the City's watersheds to ensure safe water for drinking, public recreation, healthy ecosystems and wildlife habitats.

Why?

ECONOMY

Recreation areas and shared use paths built around restored floodplains and greenways create beautiful environments that attract residents and new economy businesses to neighboring developments.

ENVIRONMENT

Reestablishing riparian forest buffers and other measures for improving water quality provide cleaner streams and a healthier watershed for the Chesapeake Bay. Forest buffers also provide wildlife habitat for birds, animals and aquatic wildlife.

EQUITY

All Frederick residents can enjoy the positive health effects of clean water and equal access to quality recreational amenities provided by Frederick waterways.

Potential Challenges with Goal 1:

The expected effect of climate change on the City of Frederick is a significant increase in temperature, which would seasonally affect the duration and type of precipitation, evapotranspiration, soil moisture and runoff. Changes in these variables translate to specific implications for the Frederick City Watershed ecosystem, including decreased water quality due to increased stormwater runoff, an increased spread of invasive plant species, and a rise in plant diseases.

Objective 1:

Improve riparian buffers and restore wetlands on all City-owned property potentially available for improvements over the next (number) years, through protection, reclamation, native plant and tree planting efforts and by implementing (number) feet riparian buffers where possible.

A review of the data shows that, just for addressing nutrient interception, a riparian buffer width up to 164 feet may be necessary. Wider buffer widths would be necessary for the riparian forest to successfully offer a full spectrum of ecosystem benefits. Potential sites for future riparian reforestation on city parkland are presented in chapter 11 of PALs: Algae in Carroll Creek. "Algae in Carroll Creek: Green Infrastructure and Community Greening Approaches" (Myers, et al. 2014).

Actions:

1. Adopt a Watershed Management Plan to address impervious areas in Tuscarora, Rock and Carroll creek watersheds.

   Short-term ***Agency**: (INSERT APPROPRIATE AGENCY)*

2. Prioritize riparian areas for city tree planting efforts.

   Ongoing ***Agency**: (INSERT APPROPRIATE AGENCY)*

3. Reduce the use of pesticides on City-owned property by creating alternative landscapes utilizing native species.

   Short-term ***Agency**: (INSERT APPROPRIATE AGENCY)*

4. Prepare an information sheet on best alternative landscape design principles to use on City-owned property, and provide a user friendly version to developers and private.

   Short-term ***Agency**: (INSERT APPROPRIATE AGENCY)*

Objective 2:

Ensure (percent) of private property owners comply with existing 50-foot riparian buffer regulation by (year), and incentivize a (number) -foot riparian buffer where possible by (year).

Much of the City watershed lands are privately owned, therefore a combination of regulatory enforcement and outreach to private land owners will be necessary to address nutrient interception and the rebuilding of vital ecosystems. An overlay could help improve water quality and maintain water supply while balancing recreation, development, and scenic character of the River corridor.

Actions:

1. Develop a public information campaign explaining benefits and features of buffer ordinances as well as events and guidelines to encourage and help residents contribute individually and stay in compliance.

   Short-term ***Agency**: (INSERT APPROPRIATE AGENCY)*

2. Prepare an information sheet about a potential Monocacy Scenic River Overlay to address new development and redevelopment in the ecologically sensitive Monocacy River corridor.

   Short-term ***Agency**: (INSERT APPROPRIATE AGENCY)*

1 Goal: Safeguard and improve the quality of the city's watersheds to ensure safe water for drinking, public recreation, healthy ecosystems and wildlife habitats.

Objective 3:

Restore the ecology of the Carroll Creek stream and floodplain, and Fishing Creek Reservoir by (year), creating high quality recreation and education destinations for The City of Frederick.

Development within the 100-year floodplain of Carroll Creek area is limited due to the increased potential for major flood events, the site presents an outstanding opportunity to restore and create new habitat communities, created resilient flood control, while fulfilling recreational activities through a Shared Use Path system and park. Fishing Creek Reservoir is a water supply source for the City of Frederick and a popular recreation destination which is also vulnerable to land use activities.

Actions:

1. Create a Frederick Municipal Forest Water Balance Model

   Water and Sewer Service Committee should work with Public Works, and the AD HOC Watershed Advisory Committee

   Mid-term **Agency**: *(INSERT APPROPRIATE AGENCY)*

2. Invest in the development of a recreation area in the Carroll creek Floodplain designed to protect the floodplain, provide educational opportunities and improve the shared use path system.

   Long-term **Agency**: *(INSERT APPROPRIATE AGENCY)*

3. Improve the connectivity of critical habitats by preserving existing connections, and improving the number and quality of those connections in accordance with Frederick greenway and shared use path plans.

   Long-term **Agency**: *(INSERT APPROPRIATE AGENCY)*

Objective 4:

Reduce the impact of invasive species by (percent) in watershed areas and stream corridors by (year).

Invasive species, both plants and pests can disrupt local ecosystems by dominating a region, adversely affecting habitats, reducing biodiversity and ecosystem services. According to the Early Detection & Distribution Mapping System's statistics, a total of 7,803 reports of invasive plants have been filed for spots within Maryland's borders. A PALS study on Frederick watersheds revealed invasive plants were often dispersed in recreation areas through human use and that invasive pests are a growing concern due to global climate change.

Actions:

1. Create a Frederick Municipal Forest Water Balance Model

   Ongoing ***Agency**: (INSERT APPROPRIATE AGENCY)*

2. Monitor for increased pest and invasive species outbreaks.

   Ongoing ***Agency**: (INSERT APPROPRIATE AGENCY)*

3. Educate the public to help reverse the introduction and spread of damaging plants and animals.

   Ongoing ***Agency**: (INSERT APPROPRIATE AGENCY)*

2 Goal: Minimize the impact of the City of Frederick's infrastructure systems and impervious surfaces on environmental resources.

Why?

ECONOMY

Utilizing green building practices for Frederick City infrastructure can help the city lower utility costs, reduce water and sewer demands and open opportunities for additional growth within the current infrastructure. More pleasant vegetated environments attract and retain residents and business that care about a high quality standard of living.

ENVIRONMENT

Impervious surfaces degrade water quality and habitat, increase water and air temperatures and stormwater runoff. Approximately 20 percent of Frederick is impervious with rooftops, parking lots, sidewalks, and other hardscape. Some areas can be up to 50 percent impervious.

EQUITY

Cool roofs, increased canopy coverage, alternative landscapes and pervious pavement when implemented equitably throughout Frederick, offer significant positive impacts to the overall health and well-being of residents.

Potential Challenges with Goal 2:

While some of these practices are costlier upfront, the intangible benefits could outweigh the costs.

Objective 1:

Implement Low Impact Development (LID) practices to capture and treat water from (percent) of the impervious surfaces for the 95th percentile of regional or local rainfall events by (year).

Low impact development (LID) is an approach to managing stormwater runoff that emphasizes on-site natural features to protect water quality by replicating the natural land cover hydrologic regime of watersheds and addressing runoff close to its source. Examples include better site design principles such as minimizing land disturbance, preserving vegetation, minimizing impervious cover, and design practices like rain gardens, vegetated swales and buffers, permeable pavement, rainwater harvesting, and soil amendments. These are engineered practices that may require specialized design assistance.

Actions:

1. Implement a city-wide stormwater management plan that reduces impervious cover, promotes infiltration and captures and treats the stormwater runoff from 90 percent of the average annual rainfall using acceptable best management practices

   Green Initiatives Team should work with the Planning Department

   Mid-term **Agency**: *(INSERT APPROPRIATE AGENCY)*

2. Identify, streamline or remove any permitting impediments for incorporating impervious surface design, rain gardens, on site water capture, green roofs, grey water use or on-site water treatment at any location in the city.

   Mid-term **Agency**: *(INSERT APPROPRIATE AGENCY)*

3. Identify and implement additional code requirements to encourage, incentivize or require stormwater best management practices on all City development and redevelopment projects.

   Mid-term **Agency**: *(INSERT APPROPRIATE AGENCY)*

4. Adopt a Watershed Management Plan to address impervious areas in Tuscarora, Rock and Carroll Creek watersheds.

   Green Initiatives Team should work with the Planning Department

   Mid-term **Agency**: *(INSERT APPROPRIATE AGENCY)*

5. Prioritize impervious area and stormwater capture interventions, or government funded projects in the most sensitive watershed areas.

   Engineering should work with Parks & Recreation

   Ongoing **Agency**: *(INSERT APPROPRIATE AGENCY)*

2 Goal: Minimize the impact of the City of Frederick's infrastructure systems and impervious surfaces on environmental resources.

Objective 2:

Use stormwater management as an aesthetic or place making design element for (percent) of new city development, redevelopment and retrofits by (year).

Low Impact Development for stormwater management systems can work with natural land forms and land uses to become a major site design element, providing not only ecological benefits, but opportunities to increase quality of life for residents. By providing beautiful green spaces for recreation, social gathering and local travel, stormwater management design can reduce heat Island effect, improve water quality and support a healthy lifestyle.

Actions:

1. Create a sustainable stormwater management project team that goes beyond traditional civil engineering expertise. Include diverse disciplines, all prepared to integrate sustainable stormwater solutions early in the design process.

   Planning Department should prepare the document for approval by the Board of Alderman

   Short-term **Agency**: *(INSERT APPROPRIATE AGENCY)*

2. Identify ways to attract and support organizations and industries that bring watershed saving design and construction to Frederick, such as green roof vendors, pervious surface manufacturers, rain garden designers, water-smart landscape architects and other low impact development industries and non-governmental organizations.

   Mid-term **Agency**: *(INSERT APPROPRIATE AGENCY)*

3. Identify potential City projects on key sites to invest in that will exemplify the synergy possible between stormwater best practice and good urban and architectural design.

   Planning Department should make recommendations to the Board of Alderman

   Ongoing **Agency**: *(INSERT APPROPRIATE AGENCY)*

4. Identify ways to incentivize development projects that combine stormwater best practice with good urban and architectural design.

   Planning Department should consult with the Building Code Appeals Board

   Mid-term **Agency**: *(INSERT APPROPRIATE AGENCY)*

Objective 3:

Reduce use of road salts and chemicals by (percent) city wide and (percent) in ecologically sensitive areas by (year).

When road salts and chemicals for snow and ice treatment on city roads enter the watershed, water quality drops, damaging habitats and contaminating ground water. City of Frederick can directly address this pollution source by implementing best practices on city roads and properties.

Actions:

1. Put in place a road salt management plan to minimize, or find safest alternatives to road salts and chemicals, particularly in environmentally sensitive areas.

   Short-term ***Agency**: (INSERT APPROPRIATE AGENCY)*

2. Minimize use of road salts and chemicals, particularly in sensitive riparian and watershed areas and ensure road salts storage is not a source of pollution.

   Ongoing ***Agency**: (INSERT APPROPRIATE AGENCY)*

3 Goal: Protect valuable and sensitive ecological resources from water pollution.

Why?

ECONOMY

Services provided by working ecosystems are extremely valuable, including natural pollution filtration and water purification, as well as tourism and recreation. Maintained natural systems can often provide these services at lower cost than engineered solutions.

ENVIRONMENT

Protecting sensitive areas from pollution using green infrastructure and neighborhood-scale stormwater management is vital to keeping habitat viable and retaining biodiversity.

EQUITY

Access to clean water is a basic human need. Investments in ensuring that these resources remain functioning and protected provide benefits across the social and economic spectrum.

Potential Challenges with Goal 3:

Some taxpayers may be opposed to the use of City funds for the purchase of land for watershed protection. Outreach and education about the importance of water supply protection and water quality will help to mitigate this challenge.

Development on brownfield sites avoids the creation of new impervious surfaces, and encourages economic vitality in existing areas while avoiding the costs of new infrastructure construction. However, new development on brownfield sites may also lead to gentrification and displacement. Therefore, environmental and economic sustainability values may come into conflict with the needs of equity.

Objective 1:

Preserve and expand areas designated for the purpose of protecting water resources: (percent) of forests by (year), (percent) of wetlands by (year), and (percent) of riparian buffers by (year).

Waterways flowing through the city become drinking source waters for Frederick residents and for downstream municipalities. The 7,500-acre Frederick City Watershed not only provides a portion of the city's water supply; it also offers significant recreational opportunities. Ultimately, the city Watershed is set aside for preserving water quality and supply for the benefit of city residents and businesses.

Actions:

1. Continue to acquire property in and near the Frederick Watershed and Municipal Forest as it becomes available for the purchase of watershed protection.

   Ongoing **Agency**: *(INSERT APPROPRIATE AGENCY)*

2. Create an annual award program to encourage the generation ideas, highlight developments that include green infrastructure, publicize the importance of stormwater management and actively engage citizens in addressing water quality issues.

   Ongoing **Agency**: *(INSERT APPROPRIATE AGENCY)*

Objective 2:

Incorporate open space preservation and natural resource protection into all planning and development process across the city by (year).

Recognizing how sprawling, low-density land use, impervious surfaces in watersheds, and fragmented open space damages valuable local ecosystems, Frederick is taking measures to plan for the long term wellbeing of its watershed and residents by preserving open space. Reinforcing that objective within the planning and development processes of the city helps protect Frederick's water resources.

Actions:

1. Incorporate an incentive-driven cluster zoning provision into the Land Management Code. This provision encourages developers to preserve contiguous open space on newly-developed property, and reduce the ecological effects of new development.

   Planning Department should prepare the document for approval by the Board of Alderman

   Short-term **Agency**: *(INSERT APPROPRIATE AGENCY)*

2. Implement incentives to encourage development on brownfield sites rather than greenfield sites. These incentives could take the form of tax abatements, density bonuses, or a streamlined permitting process.

   See Housing chapter for more opportunities

   Mid-term **Agency**: *(INSERT APPROPRIATE AGENCY)*

WATER QUALITY ANALYSIS

The following pages are in-depth analyses of each goal and objective - detailing case studies, best practices, and implementation methods. It is meant to be supplementary material that can guide Frederick.

GOAL ONE | OBJECTIVE ONE:

1) Improve riparian buffers and restore wetlands on all City-owned property potentially available for improvements over the next (number) years, through protection, reclamation, native plant and tree planting efforts and by implementing (number) feet riparian buffers where possible.

CASE STUDY:
San Francisco, CA

The City of San Francisco developed a document that both puts their water related problems in context and offers practical guidelines for developers to implement best management practices in their site design (San Francosco Stormwater Design Guidelines 2009).

GOAL ONE:

Safeguard and improve the quality of the City's watershed to ensure clean, safe water for drinking, public recreation, healthy ecosystems and wildlife habitats.

O-1:
The health of Frederick's streams is impacted by lack of riparian buffers, runoff, and air pollutants. Many of the waterways flowing through the City originate or end outside the municipality's boundaries, extending the impact of city pollutants or city water improvement efforts. With a 50-foot minimum required riparian buffer, the City is well on the way to improving the quality of its waterways. However, buffers are still lacking on several miles of stream corridor and impervious surfaces speed pollutants into the waterways downtown. Curbing runoff with innovative best management practices (BMPs) will help treat more stormwater on site and reduce the pollutant load going to the waterways. BMPs should become a focus of new development and redevelopment. The best measures for improving water quality upgrade wildlife habitat, improving the performance of ecosystems across the board, for the benefit of animal and human alike.

A review of the data shows that, just for addressing nutrient interception, a buffer width up to 164 feet may be necessary for the riparian forest to successfully offer a full spectrum of ecosystem services. Potential sites for future riparian reforestation on city parkland are presented in chapter 11 of "Algae in Carroll Creek: Green Infrastructure and Community Greening Approaches" (Myers, et al. 2014).

This plan will help the City determine which impervious areas should be prioritized to provide the best treatment with the limited funding available. The restoration of the Carroll Creek floodplain ecology provides a crucial wildlife corridor to the Monocacy River, creates a resilient flood control system that protects homes and businesses, and brings nature into a rapidly urbanizing area. By connecting local and regional destinations, a Carroll Creek Wildlife Recreation Area can enhance quality of life and serve as a cultural, ecological and economic asset for The City of Frederick. Potential conceptual designs can be found in "Carroll Creek Wildlife Recreation Area" (Ellis 2014). Similar measures taken in Tuscarora and Rock creek watersheds hold similar promise. Frederick's participation in Arbor Day Foundation's Tree City USA Standards means the City spends at least $2 per capita on a community Forestry Program (Tree City USA Standards 2015) and are now a Sterling Tree City USA because of their continual dedication of funds per capita for over 10 years. About 52 acres have been planted or are planned in riparian areas in Frederick. However, there many other riparian areas that could be planted. The "Maryland Wildlife Diversity Conservation Plan" includes recommendations to restore and protect riparian buffers as well as encourage reforestation within the watershed (Maryland Wildlife Diversity Conservation Plan 2005).

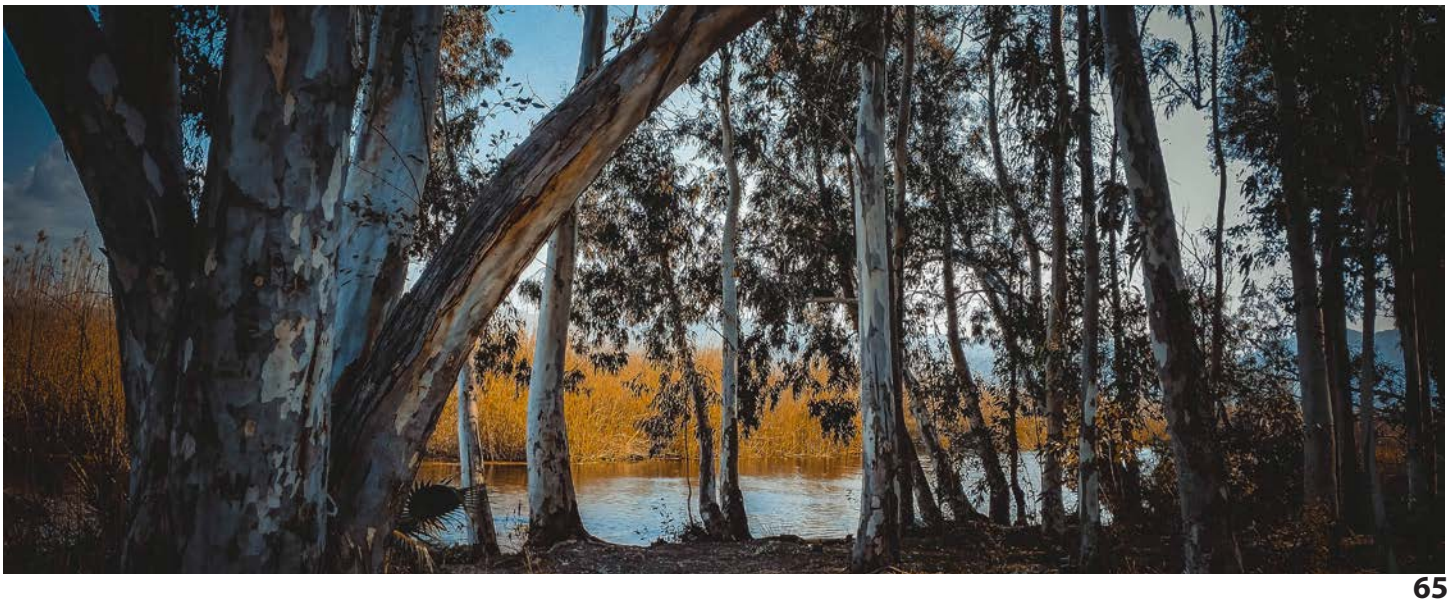
Basic restoration measures, such as reforesting river banks and constructing wetlands

in hydric soils, improve water and habitat quality and provide enhanced green corridors for wildlife. Streamside trees and logs help shape the stream channel and create pools and slow-water areas better suited for aquatic species. (Wetland Restoration, Creation, and Enhancement 2003). A restored floodplain's regenerated forest canopy would calm the force of rainwater while new wetlands absorb floodwaters, helping to keep the basements of nearby homes dry. Riparian forest buffers represent a practical approach to removing excess algae from Carroll Creek (Myers, et al. 2014, 89).

Well-designed alternative landscaping minimizes maintenance and watering, acts as a natural filter for runoff pollutants, supports wildlife and reduces the need to use toxic substances, pesticides and herbicides and fertilizer. (Myers, et al. 2014, 88). The biodiversity created by native plant communities supporting insects, fish, and small animals, also attracts keystone species like bald eagles and great blue herons, providing wildlife viewing opportunities for families (Ellis 2014). Although fertilizer runoff may not seem detrimental, these nutrients are coming from farm fields, public parks, golf courses, athletic fields, businesses and thousands of urban and suburban lawns. Fertilizers are designed to help plants grow; once in waterways they trigger the associated algae growth problems, present in Carroll Creek. As more algae grows and spreads, it becomes harmful to the other aquatic life by consuming oxygen that other aquatic plants and animals need. (Myers, et al. 2014, 84).

Frederick will need to address a variety of behavioral issues including lawn installation and management as well as landscaping on private property in order to make necessary reduction of pollutants entering the waterways. Through education, Frederick residents, business owners and developers can play an important role in improving the overall health of Frederick's watersheds. Several useful recommendations are provided in "Algae in Carroll Creek" (Myers, et al. 2014).
This document can be particularly valuable if, after drawing from general best practice in design for alternative landscape design, it incorporates local elements, such as local plant recommendations, and illustrates in an accessible way how anyone may implement an upgrade on their property.

The City of San Francisco developed a document that both puts their water related problems in context and offers practical guidelines for developers to implement best management practices in their site design (San Francosco Stormwater Design Guidelines 2009).



GOAL ONE | OBJECTIVE TWO - THREE:

2) Ensure (percent) of private property owners comply with existing 50ft riparian buffer regulation by (year), and incentivize a (number) feet riparian buffer where possible by (year).

CASE STUDY:
Lincoln, NB

The City of Lincoln Nebraska provides information on Sustainable Landscapes in an easy to access form on their website for their residents, including content on rain gardens, rain barrels, pervious parking, green roofs, lawn care, as well as available grants and incentives (Watershed Management: Sustainable Landscapes 2015).

CASE STUDY:
Florida

Florida's Water Environment Associations holds an annual water festival for just fun or education (Florida Water Festival 2015).

GOAL ONE:

Safeguard and improve the quality of the city's watershed to ensure clean, safe water for drinking, public recreation, healthy ecosystems and wildlife habitats.

O-2:
Providing the city's residents and businesses with clean water is costly. Maintaining the highest water quality possible in each of the city's water sources will help keep costs lower, but there always will be a cost to provide clean water for the population. Private property owners often are not aware of how runoff from rooftops, driveways, and even lawn can impact water quality. There are plenty of opportunities for water users to conserve, which will not only save money, but could add up to significant improvements in water quality. Examples include impervious area reduction, pervious hardscape installation, downspout disconnections, rain gardens, and improving post construction soil infiltration.

Soil compaction rates are typically about 95 percent to support structures. Soil surrounding new structures often is just as compacted reducing its ability to adequately absorb runoff. When post-construction deep tilling, chisel plowing, and compost amendment strategies are combined, runoff volume can be reduced by up to 91 percent. Exploring and possibly mandating these types of strategies will help improve water quality for the city and its downstream neighbors.

Possible strategies for getting information out include: placing pamphlets or signage at neighborhood information distribution hubs such as local businesses, libraries and community centers, placing signage or mini-libraries at popular spots along river walk, holding "water" themed events, putting accessible content on the web, packaging content with permitting paperwork, sharing information at community events, NAC meetings, via watershed alliances, and as educational offerings through Hood College, local K-12 schools, churches and service organizations. Consider non-monetary or low-monetary social and community engagement incentives like competitions or event participation with community and business sponsors as possible approaches to encouraging action. For example, best rain garden contest, with awards for best native plant use.

An overlay could help improve water quality and maintain water supply while balancing recreation, development, and scenic character of the River corridor, by extending protection to riparian buffers in those regions.

O-3:
Gambrill State Park and the Catoctin Mountains' hiking, biking, horseback riding, fishing, swimming and rock climbing right next door to Frederick provides an opportunity to grow tourism and recreation related industries. Safe water for recreation is vital to the enjoyment of many of these activities. Development within the 100-year floodplain of Carroll Creek area is limited due to the increased potential for major flood events, the site presents an outstanding opportunity to restore and create new

habitat communities, created resilient flood control, while fulfilling recreational activities through a Shared Use Path system and park (Carroll Creek Wildlife Recreation Area 2014).

Hood College has already reclaimed a site is located behind the Frederick County Health Department building at 305 Montevue Lane. It encompasses approximately 40 acres of historical pastureland and 3,000 linear feet of the main stem of Carroll Creek. Habitat restoration, riparian buffer establishment, invasive plant eradication, wetland enhancement, and the construction of a wildlife meadow have all been completed at the site, which is open for public exploration (Welcome to the Carroll Creek Wildlife Park (CCWP) 2005).

A water balancing model could capture the total impact of changing water availability and changing future demand. This tool could better predict whether Fishing Creek Reservoir has the capacity to meet future population water demands while also maintaining its ecosystem functions (Gedan, The Frederick City Watershed: Forecasting Climate Change Impacts 2014, 17).

With the construction underway along Church Street and proposals for development on the Renn Farm property, preservation of open space bordering Carroll Creek should be of high priority. A Shared Use Path and park space would help increase property values, provide recreational areas, and establish an identity for new sections of East Frederick.

Case Study: Cross Creek Ranch—A Greenway Precedent

An excellent example of a successful greenway project is the Cross Creek Ranch community on the fringes of Houston, Texas. The greenway is situated along the Flewellen Creek, a waterway that had been highly degraded by years of ditching by farmers and livestock grazing. The restoration of Flewellen Creek integrates the needs of people (waste water treatment, flood water management, and recreation needs) and the needs of wildlife (Ellis 2014, 11).

A restored Carroll Creek floodplain (Carroll Creek Wildlife Recreation Area 2014)

Restored wetland habitat at Cross Creek Ranch (Ellis 2014)

GOAL ONE | OBJECTIVE FOUR:

4) Reduce the impact of invasive species by (percent) in watershed areas and stream corridors by (year).

Invasive plants specifically are problematic because they displace native species, degrade ecosystem processes and productivity, hamper biodiversity and reduce wildlife habitat.

GOAL ONE:

Safeguard and improve the quality of the city's watershed to ensure clean, safe water for drinking, public recreation, healthy ecosystems and wildlife habitats.

O-4:
Invasive species, both plants and pests can disrupt local ecosystems by dominating a region, adversely affecting habitats, reducing biodiversity and ecosystem services According to the Early Detection & Distribution Mapping System's statistics, a total of 7,803 reports of invasive plants have been filed for spots within Maryland's borders. A PALS study on Frederick watersheds revealed invasive plants were often dispersed in recreation areas through human use and that invasive pests are a growing concern due to global climate change (Gedan, Invasive Species Survey, Frederick City Watershed 2014).

Invasive plant species are present within Frederick City Watershed and are a concern for ecosystem health. Roads and trails act as vectors for invasive species. Within Frederick City Watershed, there is a 12-mile sanctioned trail and over 70 miles of unsanctioned trails. Invasive species are widely recognized as one of the most significant threats to ecosystem stability and environmental health. Invasive plants specifically are problematic because they displace native species, degrade ecosystem processes and productivity, hamper biodiversity and reduce wildlife habitat.

A University of Maryland research group found that all sites they studied within 100 meters of a major road, with the exception of one, had invasive species present, and the mean cover of invasive generally decreased with increasing distance from the nearest road. Where invasive species have been established along trails edges, they have spread fairly far into the forest.

By closing trails farthest from roads to prevent establishment by invasive species in more remote areas, the City can then focus management efforts on removing invasive along roads, and along trails closest to roads. The most abundant invasive species by far was the Japanese stilt grass. The "Invasive Species Survey, Frederick City Watershed" recommends eradication methods (Gedan, Invasive Species Survey, Frederick City Watershed 2014).
The changing climate of the Frederick Municipal Watershed forest is expected to increase the incidence of drought and heat stress, pest outbreaks and wildfires, which could result in the infiltration of invasive plant species as well as the eventual naturalization of native plant species whose ranges are currently further south (Gedan, The Frederick City Watershed: Forecasting Climate Change Impacts 2014, 6).

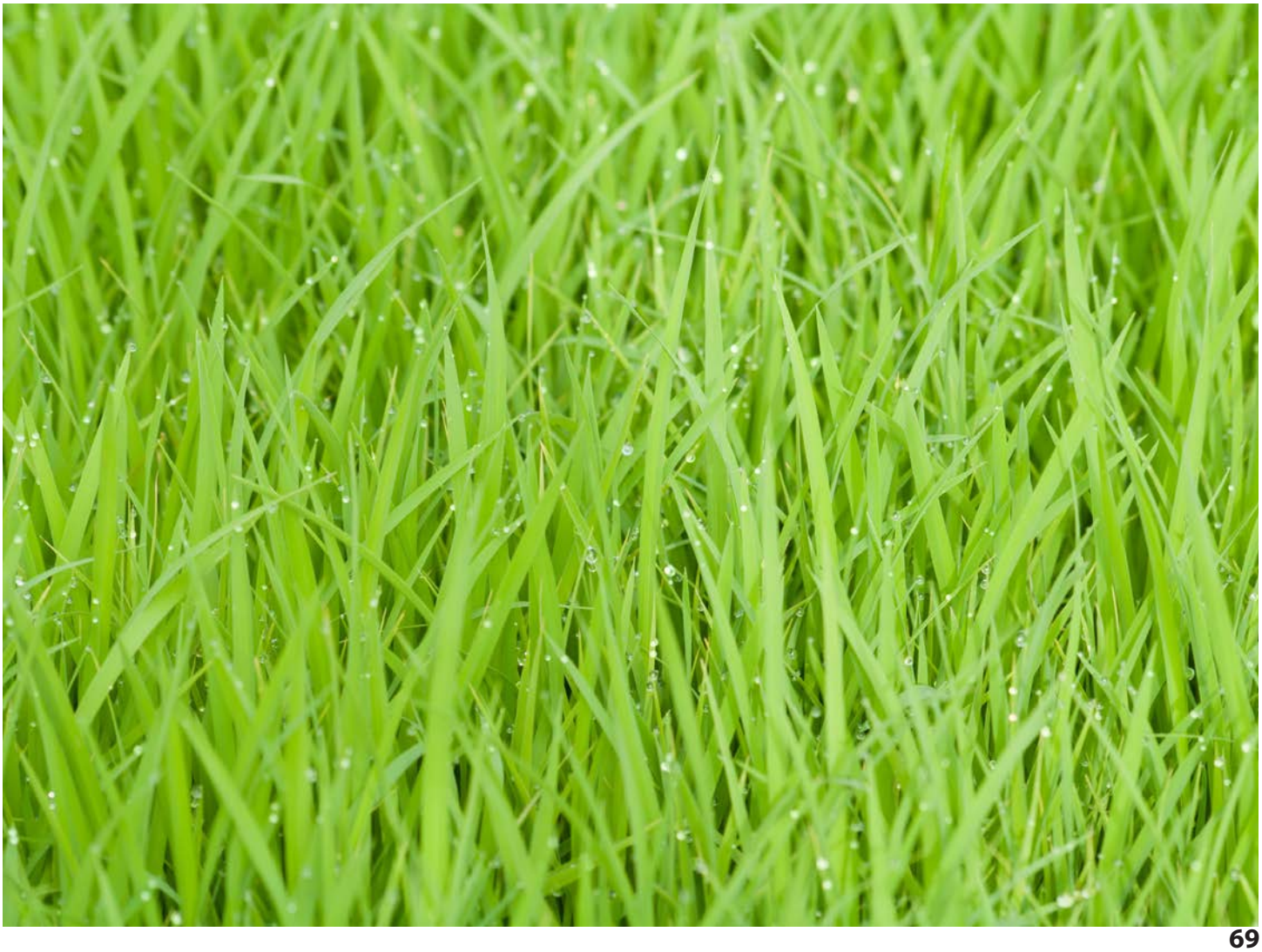
Measurement of Progress:

Indicators:
- Monitor of water quality for improvements in levels of sedimentation, phosphorus, nitrates, pollution levels, and algae growth.
- Acreage and numbers of sites of land with natural restoration and

tree planting measures taken
• Reduction of pesticides and fertilizers used by the City, specifically pounds applied and acreage treated.
• Membership in watershed related community advocacy organizations.
• Participation levels in watershed improvement activities and events.
• Development of a Forest Water Balance Model, Watershed Management Plans, Monocacy Scenic River Overlay, alternative landscaping report and public information campaign on smart watershed choices.
• Reduction in invasive species throughout Frederick: number of acres treated through mechanical or chemical means.
• Educational program for homeowners.

Benchmarks:
• Continuous improvement towards water safe for recreation and healthy ecological habitats

Potential Challenges:
• The expected effect of climate change on the City of Frederick is a significant increase in temperature, which would seasonally affect the duration and type of precipitation, evapotranspiration, soil moisture and runoff.
• Changes in these variables translate to specific implications for the Frederick City Watershed ecosystem, including decreased water quality due to increased stormwater runoff, an increased spread of invasive plant species, and a rise in plant diseases.



GOAL TWO | OBJECTIVE ONE:

1) Implement Low Impact Development (LID) practices to capture and treat water from (percent) of the impervious surfaces for the 95th percentile of regional or local rainfall events by (year).

CASE STUDY:
TrueGrid

TrueGrid, a permeable paver company highlights several projects including an ADA accessible path they created for the NASCAR Pocono Raceway with an estimated cost savings of $92070 compared to the cost of asphalt for the same project. This is just one example, among many other pervious surface solutions to demonstrate a viable alternative to concrete, particularly parking, and paths in sensitive areas (True Grid Paver Case Studies 2015).

O-1:
Low impact development (LID) is an approach to managing stormwater runoff that emphasizes on-site natural features to protect water quality by replicating the natural land cover hydrologic regime of watersheds and addressing runoff close to its source. Examples include better site design principles such as minimizing land disturbance, preserving vegetation, minimizing impervious cover, and design practices like rain gardens, vegetated swales and buffers, permeable pavement, rainwater harvesting, and soil amendments. These are engineered practices that may require specialized design assistance (Rainwater Management | U.S. Green Building Council SS6 2015).

Impervious surfaces in the built environment degrade water quality and habitat, increase water and air temperatures and stormwater runoff. A sustainable Frederick will mean finding balance between developed spaces and the natural environment.

Approximately 20 percent of Frederick is impervious with rooftops, parking lots, sidewalks, and other hardscape. Some areas can be up to 50 percent impervious. The heat island, an urban area that is typically warmer than the surrounding rural landscape, can mean increased temperatures within the City of about five degrees Fahrenheit during the day and 22 degrees at night, according to the U.S. Environmental Protection Agency. Impervious surfaces cause much of this temperature increase.

Stormwater from impervious surfaces runs off into the nearest waterway without the benefit of being filtered through plant roots and soil, carrying pollutants directly to the stream. With little or no vegetation to help filter stormwater and provide shade, stream temperatures increase and habitat can be degraded with excess sediment and algae blooms.

Alternatives, such as cool roofs, increased canopy coverage, and pervious pavement could potentially be costly to install and maintain, but will offer significant positive impacts to water quality, energy efficiency, and health of residents. Green building practices both help the property owner in lowering utilities and creating a more sustainable community and the City of Frederick by reducing water and sewer demands.

The current requirement is to treat the first inch of runoff, but allowing more stormwater to filter through swales, rain gardens, and other spaces will further improve water quality. Innovative features, such as grey water use in a building, or on-site sewage treatment, green roofs, living walls, natural landscaping, stormwater drain disconnects, among other environmental site designs may be prohibited or restricted in some zoning provisions or may require an extensive approval processes. Finding ways to remove restrictions

GOAL TWO:

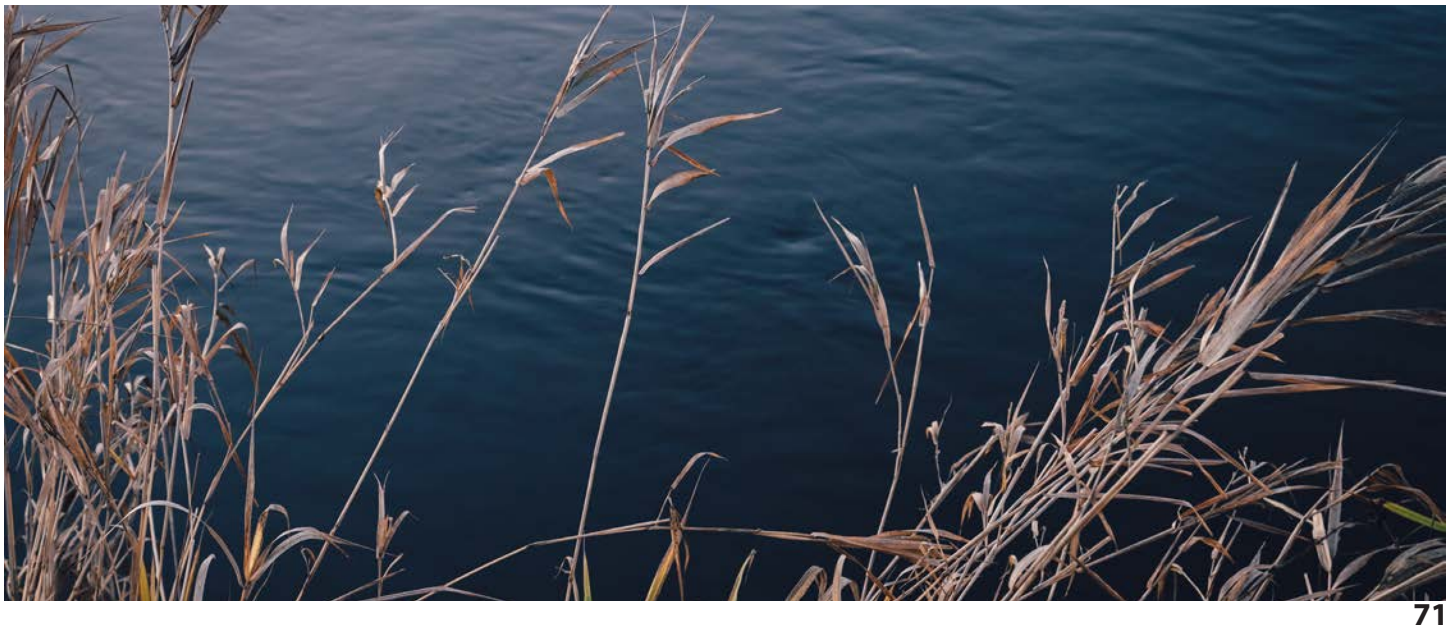
Minimize the impact of the City of Frederick's infrastructure systems and impervious surfaces on environmental resources.

and streamline process can help accelerate desirable improvements. Extend this to home owners associations, and encourage them to allow and promote water friendly landscapes, green roofs and rain barrels which some HOAs currently prohibit.

Current Stormwater credits are defined in the Maryland Department of Environment, 2000 Maryland Stormwater Design Manual. Credits are calculated for using nonstructural practices including Natural Area Conservation, Disconnection of Rooftop Runoff, Disconnection of Non Rooftop Runoff, Sheet Flow to Buffers, Open Channel Use, and Environmentally Sensitive Development. The percentage refers to the reduction in Water Quality Volume (WQv) from a development. (City of Frederick Land Management Code 2005) Other types of incentive programs are outlined in the EPA's "Managing Wet Weather with Green Infrastructure" including fee discounts, development incentives, grants, rebates & installation financing, awards & recognition programs. (Managing Wet Weather with Green Infrastructure 2009)

Case Study: Philadelphia, Pennsylvania offers a fast track review process for projects with 95 percent or more of the impervious area disconnected from the storm sewer, completing reviews within 5 days of submittal. This provides time and cost saving for the project and come at low or no cost for the City (Using Incentive Programs to Promote Stormwater BMPs 2015). Resources for determining what best management practices to encourage include the EPA (Stormwater Management Best Practices 2012), Water Environment Research Foundation (Using Incentive Programs to Promote Stormwater BMPs 2015), and the International Stormwater BMP Database (International Stormwater BMP Database 2015). This plan will help the City determine which impervious areas should be prioritized to provide the best treatment with the limited funding available.

Pervious surfaces can be ADA compliant, can filter contaminants, can grow grass or other low plants, require very little maintenance, utilize local aggregate, can allow heavy vehicle use on them, reduce the need for road salts, and in some contexts cost less than equivalent concrete or asphalt installations.



GOAL TWO | OBJECTIVE TWO:

2) Use stormwater management as an aesthetic or place making design element for (percent) of new city development, redevelopment and retrofits by (year).

CASE STUDY:
New Hampshire

New Hampshire recognized that issue of salt loading is complex and has no single solution. There are a variety of surfaces being treated in each of the Watersheds, winter weather conditions vary, and solutions must balance future development and safety. However, they were able to identify different ways of making improvement to minimize pollution. For example, the incorporation of pervious surfaces has been identified as one possible way to help minimize the need for high quantities of road salts (Taylor 2008).

GOAL TWO:

Minimize the impact of the City of Frederick's infrastructure systems and impervious surfaces on environmental resources.

O-2:
Low Impact Development for stormwater management systems can work with natural land forms and land uses to become a major site design element, providing not only ecological benefits, but opportunities to increase quality of life for residents. By providing beautiful green spaces for recreation, social gathering and local travel, stormwater management design can reduce heat Island effect, improve water quality and support and encourage healthy lifestyles. Green systems can also maximize land values, improve project marketability, and attract businesses and residents, all while providing wildlife habitat and environmental education (Fazio 2015).

Examples of such team participants might include: landscape architects, geologists, geotechnical engineers, planners, urban designers, artists, and licensed design professionals.

The advantage of pursuing green policies in Frederick is the opportunity to attract and support green business including intellectual property, direct service and manufacturing. Over time Frederick could become a regional hub for environmental friendly expertise and resources.

In line with the connection between land use planning and transportation planning, major community hubs can also benefit from City projects that using good stormwater best management practices as a design feature at these important city nodes and gathering places.

Rewarding developers who are in line with Fredericks vision is an important component to a holistic approach to combining water quality goals and great urban places.

O-3:
When road salts and chemicals for snow and ice treatment on city roads enter the watershed, water quality drops, damaging habitats and contaminating ground water (Road Salt: Moving Toward The Solution 2010). The City of Frederick can directly address this pollution source by implementing best practices on city roads and properties.

Measurement of Progress:

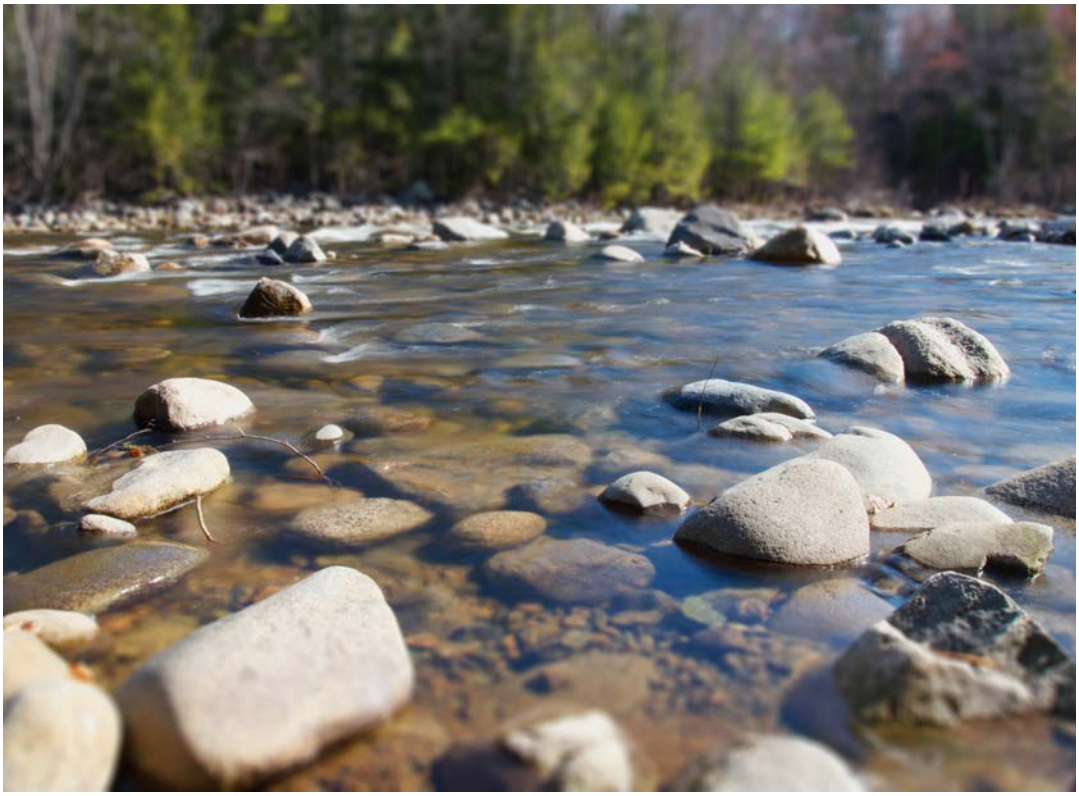
Indicators:
- Number and percent of public infrastructure projects designed or to retrofit for low impact standards
- Number and percent of subdivisions meeting low impact standards
Number and percent of green roofs in urbanized areas
- Number and percent of low impact development projects in the outlying and low-density areas
Amount of road salts and chemicals being used.

Benchmarks:
- All future and redeveloped public infrastructure projects include elements designed reduce

impervious coverage and capture stormwater runoff volumes beyond 1" of rainfall.

• An increase in number of private property, either new developments, redevelopments or retrofits that have incorporated pervious surfaces, green roofs or other rainwater capture measures that capture stormwater runoff volumes beyond 1" of rainfall.

• A reduction in road salt use up to 50 percent of current usage.



Current Frederick storage (at Public Works dept. 111 Airport Drive East).

Current stormwater control on that property.

GOAL THREE | OBJECTIVE ONE - TWO:

1) Preserve and expand areas designated for the purpose of protecting water resources: (percent) of forests by (year), (percent) of wetlands by (year), and (percent) of riparian buffers by (year).

GOAL SUMMARY: Washington, DC

Washington DC's Mayor and DC Council committed $4.5 million dollars of capital budget to fund innovative sustainability projects beginning in 2013.Through a competitive process, agencies proposed new sustainability projects and plan for longer term needs. Some projects were public-private partnerships, enlisting local stakeholders to incorporate their expertise (Innovation Projects 2015). DC's commitment to their "Budget Challenge" sustainability competition was reconfirmed in their current sustainability plan (Sustainability DC 2015, 18).

GOAL THREE:

Protect valuable and sensitive ecological resources from water pollution.

O-1:
Waterways flowing through the city become drinking source waters for Frederick residents and for downstream municipalities. The city's water supply currently comes from Linganore and Fishing creeks and the Monocacy and Potomac rivers. The Potomac River provides about 16 percent of the city's water, and will eventually provide more than 50 percent of the city's water supply through the Potomac River Water Service Agreement with Frederick County.

The 7,500-acre Frederick City Watershed not only provides a portion of the city's water supply; it also offers significant recreational opportunities. The watershed is a major connector between Gambrill and Cunningham Falls state parks with more than 80 miles of trails, only 12 of which are sanctioned. The Mayor-appointed Watershed Ad Hoc Committee is addressing the balance of water quality, water supply, and recreation in the watershed. Ultimately, the city watershed is set aside for preserving water quality and supply for the benefit of city residents and businesses.

The City has engaged in the purchase of land within its watershed so as to protect the water supply, and has money allocated to continue to purchase land when it becomes available. The continuation of this provision will have a significant impact in the improvement of water quality for the City of Frederick and will help reinforce other City objectives, like expanding greenways and shared use paths and providing accessible recreation throughout the city.

O-2:

To help protect the water supply resources, the City is part of the Potomac Drinking Water Source Protection Partnership (DWSPP), a formal agreement among jurisdictions whose drinking water source is the Potomac. Each year, the Interstate Commission on the Potomac River Basin's Cooperative Operations for Water Supply on the Potomac (CO-OP) conducts exercises with Potomac water utilities to practice protocols during times of drought. Should drought or disaster impact the region, Frederick will need to have a good handle on how its water supply might be affected.

This provision encourages developers to preserve contiguous open space on newly-developed property, and reduce the ecological effects of new development (Example is Montgomery County zoning code Article 59-4 §4.3.5) The City of Frederick currently encourages cluster development through Planned Neighborhood Development (PND) (Land Management Code 2005, Sec. 410), which requires a per project approval process. A specific cluster zoning provision can streamline the process and save the developer money and the City time.

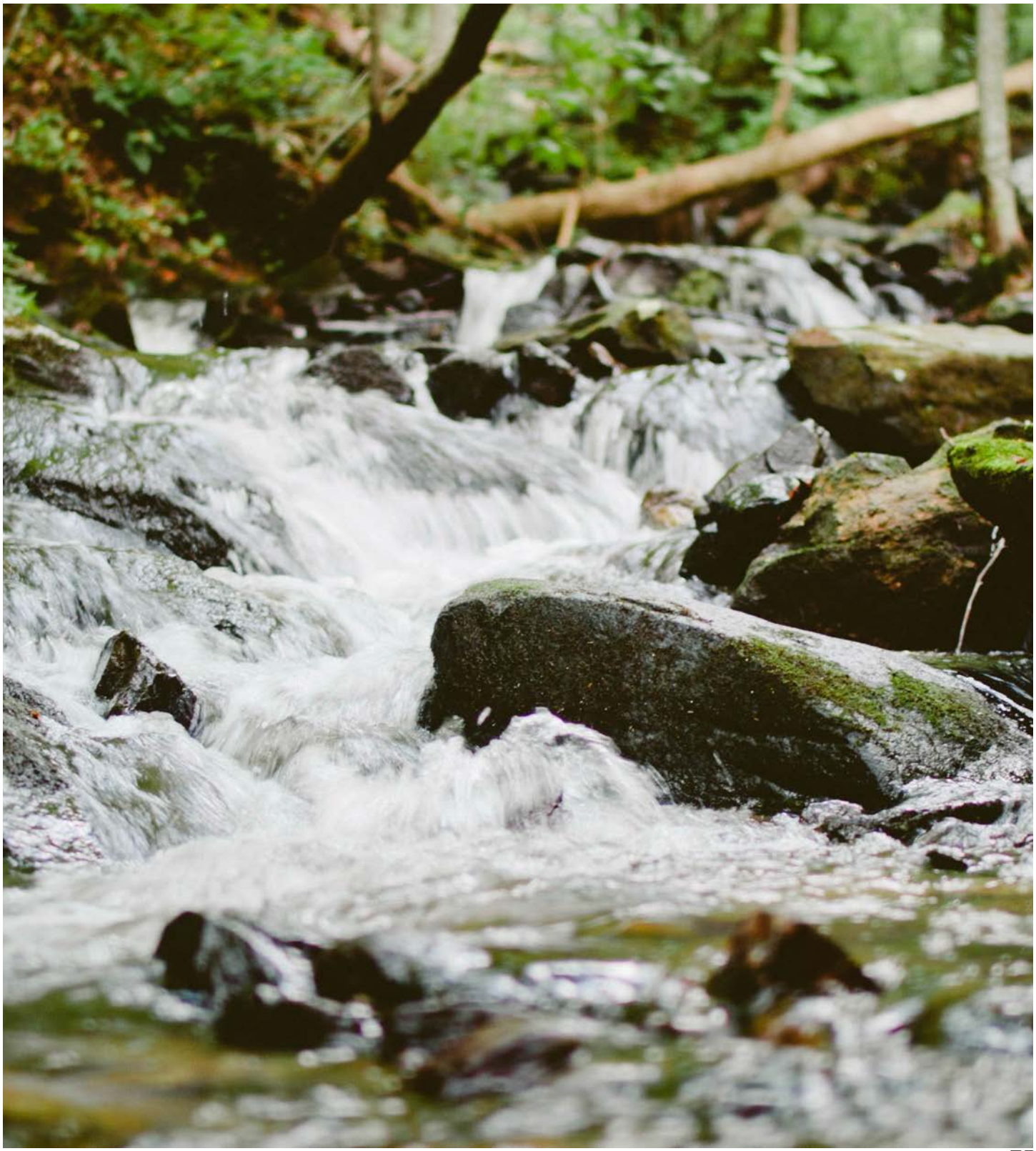
See chapters Housing and Built Environment for more discussion on brownfield and infill development.

Measurement of Progress:

Indicators:
- Acres of protected land
- Number of Green infrastructure installations

Benchmarks:
- 2 percent increase in protected land per year.

2) Incorporate open space preservation and natural resource protection into all planning and development process across the city by (year).



GOALS, OBJECTIVES AND ACTIONS SUMMARY TABLE

Goal 1: Safeguard and improve the quality of the City's watersheds to ensure clean, safe water for drinking, public recreation, healt	
Objective 1: Improve riparian buffers and restore wetlands on all City-owned property potentially available for improvements over the next (numb	
1.1.1	Adopt a Watershed Management Plan to address impervious areas in Tuscarora, Rock and Carroll creek watersheds.
1.1.2	Prioritize riparian areas for City tree planting efforts.
1.1.3	Reduce the use of pesticides on City-owned property by creating alternative landscapes utilizing native species.
1.1.4	Prepare an information sheet on best alternative landscape design principles to use on city owned property, and provide a user frie
Objective 2 : Ensure (percent) of private property owners comply with existing 50ft riparian buffer regulation by (year), and incentivize a (numbe	
1.2.1	Develop a public information campaign explaining benefits and features of buffer ordinances as well as events and guidelines to en
1.2.2	Prepare an information sheet about a potential Monocacy Scenic River Overlay to address new development and redevelopment in
Objective 3 : Restore the ecology of the Carroll Creek stream and floodplain, and Fishing Creek Reservoir by (year), creating high quality recreatio	
1.3.1	Create a Frederick Municipal Forest Water Balance Model.
1.3.2	Invest in the development of a recreation area in the Carroll creek Floodplain designed to protect the floodplain, provide education
1.3.3	Improve the connectivity of critical habitats by preserving existing connections, and improving the number and quality of those cor
Objective 4 : Reduce the impact of invasive species by (percent) in watershed areas and stream corridors by (year).	
1.4.1	Trail closures furthest from roads to prevent establishment by invasive species in more remote areas and removing invasive plants a
1.4.2	Monitor for increased pest and invasive species outbreaks.
1.4.3	Educate the public to help reverse the introduction and spread of damaging plants and animals.
Goal 2: Minimize the impact of the City of Frederick's infrastructure systems and impervious surfaces on environmental resources.	
Objective 1: Implement Low Impact Development (LID) practices to capture and treat water from (percent) of the impervious surfaces for the 95t	
2.1.1	Implement a city-wide stormwater management plan that reduces impervious cover, promotes infiltration and captures and treats
2.1.2	Identify, streamline or remove any permitting impediments for incorporating impervious surface design, rain gardens, on site wate
2.1.3	Identify and implement additional code requirements to encourage, incentivize or require stormwater best management practices
2.1.4	Adopt a Watershed Management Plan to address impervious areas in Tuscarora, Rock and Carroll Creek watersheds.
2.1.5	Prioritize impervious area and stormwater capture interventions, or government funded projects in the most sensitive watershed ar
Objective 2 : Use stormwater management as an aesthetic or place making design element for (percent) of new city development, redevelopme	
2.2.1	Create a sustainable stormwater management project team that goes beyond traditional civil engineering expertise.
2.2.2	Identify ways to attract and support organizations and industries that bring watershed saving design and construction to Frederick.
2.2.3	Identify potential City projects on key sites to invest in that will exemplify the synergy possible between stormwater best practice ar
2.2.4	Identify ways to incentivize development projects that combine stormwater best practice with good urban and architectural design

hy ecosystems and wildlife habitats. ber) years	TIMEFRAME	LEAD AGENCY
	Short-term	(INSERT APPROPRIATE AGENCY)
	Ongoing	(INSERT APPROPRIATE AGENCY)
	Short-term	(INSERT APPROPRIATE AGENCY)
ndly version to developers and private.	Short-term	(INSERT APPROPRIATE AGENCY)
r) feet riparian buffer where possible by (year).		
courage and help residents contribute individually	Short-term	(INSERT APPROPRIATE AGENCY)
the ecologically sensitive Monocacy River corridor.	Short-term	(INSERT APPROPRIATE AGENCY)
n and education destinations for The City of Frederick.		
	Mid-term	(INSERT APPROPRIATE AGENCY)
al opportunities and improve the shared use path system.	Long-term	(INSERT APPROPRIATE AGENCY)
nnections.	Long-term	(INSERT APPROPRIATE AGENCY)
long roads, and along trails closest to roads.	Ongoing	(INSERT APPROPRIATE AGENCY)
	Ongoing	(INSERT APPROPRIATE AGENCY)
	Ongoing	(INSERT APPROPRIATE AGENCY)
h percentile of regional or local rainfall events by (year).		
the stormwater runoff from 90% of the average annual rainfall	Mid-term	(INSERT APPROPRIATE AGENCY)
capture, green roofs, grey water use or on-site water treatment	Mid-term	(INSERT APPROPRIATE AGENCY)
on all City development and redevelopment projects.	Mid-term	(INSERT APPROPRIATE AGENCY)
	Mid-term	(INSERT APPROPRIATE AGENCY)
eas.	Ongoing	(INSERT APPROPRIATE AGENCY)
nt and retrofits by (year).		
	Short-term	(INSERT APPROPRIATE AGENCY)
	Mid-term	(INSERT APPROPRIATE AGENCY)
nd good urban and architectural design.	Ongoing	(INSERT APPROPRIATE AGENCY)
.	Mid-term	(INSERT APPROPRIATE AGENCY)

GOALS, OBJECTIVES AND ACTIONS SUMMARY TABLE

Objective 3 : Reduce use of road salts and chemicals by (percent) city wide and (percent) in ecologically sensitive areas by (year).	
2.3.1	Put in place a road salt management plan to minimize, or find safest alternatives to road salts and chemicals, particularly in environ
2.3.2	Minimize use of road salts and chemicals, particularly in sensitive riparian and watershed areas and ensure road salts storage is not a
Goal 3: Protect valuable and sensitive ecological resources from water pollution.	
Objective 1: Preserve and expand areas designated for the purpose of protecting water resources: (percent) of forests by (year), (percent) of wetl	
3.1.1	Continue to acquire property in and near the Frederick Watershed and Municipal Forest as it becomes available for the purchase of
3.1.2	Create an annual award program to encourage the generation ideas, highlight developments that include green infrastructure, pub
Objective 2 : Incorporate open space preservation and natural resource protection into all planning and development process across the City by	
3.2.1	Incorporate an incentive-driven cluster zoning provision into the Land Management Code. This provision encourages developers to
3.2.2	Implement incentives to encourage development on brownfield sites rather than greenfield sites.

mentally sensitive areas.	Short-term	(INSERT APPROPRIATE AGENCY)
a source of pollution.	Ongoing	(INSERT APPROPRIATE AGENCY)
ands by (year), and (percent) of riparian buffers by (year).		
watershed protection.	Ongoing	(INSERT APPROPRIATE AGENCY)
olicize the importance of stormwater management.	Ongoing	(INSERT APPROPRIATE AGENCY)
(year).		
o preserve contiguous open space on newly-developed property.	Short-term	(INSERT APPROPRIATE AGENCY)
	Mid-term	(INSERT APPROPRIATE AGENCY)

3 | Air Quality

Introduction

Goals:

1. Continue regional collaboration.
2. Develop a comprehensive city-wide air quality strategy.
3. Implement successful strategies used by other cities to mitigate pollution and improve air quality.

Clean and breathable air is one of the most essential components of a healthy environment in which to live, work, and play. Exposure to elevated levels of airborne pollutants causes or aggravates a range of lung and respiratory ailments including allergies, emphysema, pneumonia, and chronic bronchitis. Research has shown that prolonged exposure to such pollutants increases the risk for cardiovascular problems such as heart attacks, strokes, heart failure, and irregular heartbeats. (United States Enivronmental Protection Agency n.d.) Knowing the risks of air pollution, it is important that local governments take significant steps toward promoting clean air for all of their citizens.

In addition to promoting and preserving the health of individuals, air quality is also inextricably tied to the health of the planet. Over the past several years, governments at the local and national level have become more proactive in addressing global climate change. All the effects of a changing climate, from rising temperatures to more frequent and intense weather systems, pose a threat to the city and its residents. By reducing the amount of greenhouse gases emitted, Frederick can do its part to combat global climate change.

Locally-generated air pollutants are carried to waterways via stormwater runoff. Of particular concern are pollutants from the combustion of fossil fuels, the release of chemical byproducts from industrial and agricultural processes, and waste incineration, according to the Environmental Protection Agency (EPA). Most importantly, air quality is directly related to many of the other areas of focus in this sustainability plan. Transportation, energy, urban canopy, and housing have direct effects on air quality. Continuing to encourage alternative modes of transportation, providing safe bicycle and pedestrian corridors, building infrastructure for electric vehicles, and increasing the urban tree canopy will help reduce emissions on a local scale.

Determining objectives to achieve the goals of the air quality section of any jurisdiction's sustainability plan is challenging, as air quality and many other environmental issues do not conform to political boundaries. In the case of Frederick, much of the airborne pollution originates from states to the west. Therefore, while Frederick could set a goal of reducing pollutants in the city's air by 20 percent over the next 10 years, there is very little that Frederick could actually do to attempt achieving that goal, and those efforts would likely not be successful anyway. Therefore, this section of the sustainability plan focuses on the types of partnerships and data sharing that could be useful in addressing air quality issues with conjunction other jurisdictions, and to make the public aware of how they can improve Frederick's air quality through their own actions. In addition, instead of setting objectives to achieve within a certain timeframe, some goals have suggested strategies.

1 Goal: Continue regional collaboration.

Why?

ECONOMY

Economies of scale may make solutions that are not cost effective to pursue at a local level possible at a regional level

ENVIRONMENT

Air pollution can negatively impact the environment through acid rain, eutrophication, haze, ozone depletion, ecosystem disruption, crop and forest damage, as well as global climate change.

EQUITY

Air pollution increases the risk for a myriad of health problems, and those citizens without health insurance are at greater risk than those who do.

Objective 1:

Maintain and strengthen existing partnerships with neighboring jurisdictions and organizations such as the MWCOG.

For several decades, the Metropolitan Washington Council of Governments (MWCOG) has overseen various programs and committees that promote air quality improvements in the Baltimore-Washington area, including the City of Frederick. In addition, MWCOG is authorized by the governments of the State of Maryland, the Commonwealth of Virginia, and the District of Columbia to represent the entire region in fulfilling the Clean Air Act of 1990. Under this structure, collaborating through MWCOG to address air quality issues is a strategy that is likely to bring continued success in this area.

Actions:

1. Continue to take part in and promote the MWCOG-sponsored programs, such as Clean Air Partners, that work to improve the region's air quality.

   Ongoing **Agency**: *(INSERT APPROPRIATE AGENCY)*

   One of MWCOG's air quality observation stations is located at the Frederick Airport. Monitoring the actual air pollution at this location over time can indicate whether or not air quality goals are being met, especially if fewer or no Ozone Alert Days are declared over time.

2. Continue to adhere to the regulations laid out in MWCOG's State Implementation Plan (SIP), written following the EPA's 2005 determination that the DC area, including Frederick, was failing to meet National Ambient Air Quality Standards (NAAQS). As MWCOG is authorized to represent the entire region in fulfilling the Clean Air Act of 1990, MWCOG is also responsible for developing the SIP that is ultimately approved by the EPA.

   Ongoing **Agency**: *(INSERT APPROPRIATE AGENCY)*

1 Goal: Continue regional collaboration.

Objective 2:

Explore new partnerships with jurisdictions and governmental councils and establish such partnerships where appropriate.

Air quality issues are challenging for individual, local jurisdictions to address on their own, as pollution takes no heed of any political boundaries. Typically, environmental issues are handled by larger governmental entities, such as state governments, rather than local jurisdictions. MWCOG coordinates air quality policy for the Washington, DC region. However, Frederick should still seek out partnerships to address air pollution issues with neighboring jurisdictions and governmental councils. This is especially recommended for jurisdictions to the west of Frederick where airborne pollutants may originate.

Actions:

1. Establish relationships with neighboring non-member MWCOG jurisdictions and governmental councils, especially Carroll County, Washington County, Adams County, PA, the Commonwealth of Pennsylvania's Department of Environmental Protection, and the Baltimore Metropolitan Council.

   Short-term **Agency**: *(INSERT APPROPRIATE AGENCY)*

   Carroll County is a member of the Baltimore Metropolitan Council (BMC), which MWCOG collaborates with on some projects.

2. Explore which jurisdictions to the west of Frederick are logical partners for air quality collaboration, as airborne pollutants originate to Frederick's west and then travel eastward towards Frederick.

   Short-term **Agency**: *(INSERT APPROPRIATE AGENCY)*

Objective 3:

Implement regional data sharing and exchange of best practices from other jurisdictions by (date).

MWCOG collects air quality data throughout the Washington region, but the partnerships that exist and those that have been proposed in the prior objective should be used to create opportunities to share data and best practices in order to understand how pollutants travel across the United States and impact Frederick's environment.

Actions:

1. Hold semi-annual meetings with regional and other partners to compare data and share best practices in addressing air quality issues.

   Short-term **Agency**: *(INSERT APPROPRIATE AGENCY)*

2 Goal: Develop comprehensive city-wide air quality strategy.

Why?

ECONOMY

Reductions in fuel consumption will save taxpayer dollars and lower utility bills

ENVIRONMENT

Air pollution can negatively impact the environment through acid rain, eutrophication, haze, ozone depletion, ecosystem disruption, crop and forest damage, as well as global climate change.

EQUITY

Air pollution increases the risk for a myriad of health problems, and those citizens without health insurance are at greater risk than those who do.

Objective 1:

Implement Program to Inform Public of Fluctuating Air Quality by (date).

Frederick Municipal Airport is one of only twenty-four air quality monitoring centers operating in the state of Maryland. Yet with easy access to real-time data, the City has no program for informing the public about air quality levels.

Actions:

1. Add functionality to City of Frederick's government website that reports real-time data on air quality fluctuations.

   Short-term — ***Agency**: (INSERT APPROPRIATE AGENCY)*

2. Publish annual report on air quality using information obtained from the monitoring station at Frederick Municipal Airport and other sources.

   Mid-term — ***Agency**: (INSERT APPROPRIATE AGENCY)*

3. Establish "Air Quality Hotline" that citizens can telephone to receive up-to-date air quality information.

   Short-term — ***Agency**: (INSERT APPROPRIATE AGENCY)*

Objective 2:

Encourage coordination within City government to implement policies related to air quality by (date).

Most departments within the government of Frederick have some connection to the city's air quality. For example, the Department of Planning can improve air quality through policies aimed at promoting public transportation. Similarly, the Department of Public Works can improve air quality by continuing to grow the city's urban canopy. While this plan enumerates many of the policies related to air quality, only through increased coordination can the City put forth a concerted effort to ensure clean air for all of Frederick's citizens.

Actions:

1. Schedule quarterly meetings on air quality to be attended by the leadership of all government agencies.

   Short-term — ***Agency**: (INSERT APPROPRIATE AGENCY)*

2. In conjunction with quarterly meeting, disseminate internal tracking report that monitors progress of all government policies and programs related to air quality.

   Short-term — ***Agency**: (INSERT APPROPRIATE AGENCY)*

3. Encourage data-sharing between agencies as needed.

   Short-term — ***Agency**: (INSERT APPROPRIATE AGENCY)*

2 Goal: Develop comprehensive city-wide air quality strategy.

Objective 3:

Design Air Quality Education Program for Frederick's Citizens by (date).

With the myriad of deleterious health effects associated with unclean air, the citizens of Frederick need to be informed about their city's air quality.

Actions:

1. Organize educational events for the public designed to educate about the impact of air quality on health and the steps individuals can take to improve air quality.

   Short-term — ***Agency**: (INSERT APPROPRIATE AGENCY)*

2. Conduct school-based outreach.

   Short-term — ***Agency**: (INSERT APPROPRIATE AGENCY)*

3. Conduct outreach to local business to form an Air Quality Coalition.

   Mid-term — ***Agency**: (INSERT APPROPRIATE AGENCY)*

3 Goal: Implement strategies used by other cities to mitigate pollution and improve air quality.

Why?

ECONOMY

Using successful best practices from other cities can offer financial savings

ENVIRONMENT

Peer cities may employ strategies applicable to Frederick's unique environmental needs

EQUITY

Few cities devote sections of their sustainability plans to air quality issues. While regional strategies are often more practical for dealing with this type of issue, some city residents will benefit more if the city takes the initiative to solve air quality issues at the local level as well.

Objective 1:

Select case studies for further examination and determine if those case studies are applicable to Frederick by (date).

Few cities have an air quality section within their own sustainability plans. Two cities that do have such sections are Newark, NJ and Sacramento, CA. While these are much larger cities than Frederick, some of the strategies in their plans (or other cites' plans) may be transferrable.

Actions:

1. Implement strategies established through examining other cities' sustainability plans as appropriate and necessary.

   Ongoing — ***Agency**: (INSERT APPROPRIATE AGENCY)*

Objective 2:

Use existing partnerships to encourage other cities to address air quality as part of their sustainability plans by (date).

Few cities address air quality as part of their sustainability plans, yet this is an issue that affects not only the residents and municipal operations of individual cities, but also people who live both close to and hundreds or thousands of miles away from pollution sources.

Actions:

1. Through existing partnerships, encourage other MWCOG member jurisdictions that do not address air quality as part of their sustainability plans or environmental policies to do so.

   Short-term — ***Agency**: (INSERT APPROPRIATE AGENCY)*

2. Through existing or new partnerships as outlined in the previous goal, coordinate Frederick's air quality policies with states, counties, and cities to the west of Frederick where and when appropriate.

   Mid-term — ***Agency**: (INSERT APPROPRIATE AGENCY)*

AIR QUALITY ANALYSIS

The following pages are in-depth analyses of each goal and objective - detailing case studies, best practices, and implementation methods. It is meant to be supplementary material that can guide Frederick.

GOAL ONE | OBJECTIVE ONE - THREE:

1) Maintain and strengthen existing partnerships with neighboring jurisdictions and organizations such as the MWCOG.
2) Explore new partnerships with jurisdictions and governmental councils and establish such partnerships where appropriate.

"the City of Frederick should continue to take part in and promote the MWCOG-sponsored programs."

GOAL ONE:

Continue regional collaboration.

O-1:
For several decades, the Metropolitan Washington Council of Governments (MWCOG) has overseen various programs and committees that promote air quality improvements in the Baltimore-Washington area, including the City of Frederick. In addition, MWCOG is authorized by the governments of the State of Maryland, the Commonwealth of Virginia, and the District of Columbia to represent the entire region in fulfilling the Clean Air Act of 1990. (Metropolitan Washington Council of Governments n.d.) For example, in 2005, the Environmental Protection Agency (EPA) designated the Washington, DC area, including the City of Frederick, to be an area that was not meeting the National Ambient Air Quality Standards (NAAQS). As a result, the region had to submit an air quality plan (referred to as a State Implementation Plan or SIP by the EPA) for improving the area's air quality to the EPA in early 2008. The SIP was authored by MWCOG, and the standards within it are enforceable as state law. The nonattainment standards were to remain in place through 2010.

No updates to the SIP are available on the MWCOG website after 2008. However, the number of "Code Red Ozone Alert Days" in the DC area has gone down significantly in recent years. During the summer months, MWCOG releases an air quality forecast to alert the public if ground level ozone and other pollutants may reach unhealthy levels on a 5 point scale. Governments, businesses, and individual residents are encouraged to reduce ground level ozone emissions on "code red" and "code purple" days. However, In the summer of 2013, there were only four "code orange" days and no "code red" days, while prior to 2006, temperatures above 90 degrees almost always resulted in "code orange" or "code red" days (Metropolitan Washington Council of Governments 2013). These results suggest that the region wide SIP and related initiatives are successful in improving the region's air quality, and Frederick should continue to participate in these programs.

As regional governments are best equipped to deal with challenges such as improving air quality and controlling pollution, the City of Frederick should continue to take part in and promote the MWCOG-sponsored programs.

O-2:
Frederick has very little industry that contributes to air pollution, however, airborne pollutants can travel hundreds of miles, settle on land, and be carried to waterways in runoff. Of particular concern are pollutants from the combustion of fossil fuels, the release of chemical byproducts from industrial and agricultural processes, and waste incineration, according to the Environmental Protection Agency (EPA).

Pollution from industry in states west of Maryland is the source for much of the airborne pollution that reaches Frederick. While Frederick does not have the ability to legislate the jurisdictions to its west (or vice versa), it can explore and create partnerships with the individual jurisdictions and governmental councils to the west. Such partnerships would enable Frederick to express concerns about air pollution to the

3) Implement regional data sharing and exchange of best practices from other jurisdictions by (date).

jurisdictions where the pollution originates, and those jurisdictions would become more aware of how their laws and practice affects downstream communities.

Closer to home, the City should establish partnerships with the non-MWCOG members in the immediate vicinity to address air quality issues in the area. Jurisdictions that Frederick should reach out to include Carroll County (which is a member of the Baltimore Metropolitan Council (BMC), and MWCOG and BMC already work together on some projects) and Washington County in Maryland, Adams County in Pennsylvania, and the Commonwealth of Pennsylvania's Department of Environmental Protection.

O-3:
Air quality issues do not neatly conform to existing political boundaries. While MWCOG collects data on air quality conditions and creates a historical record to examine over time, it is important that communities to Frederick's west understand the impact of their policies on communities downstream where airborne pollutants ultimately land. One of the potential benefits of establishing the partnerships outlined the previous objective is that Frederick and its partner jurisdictions can share data and exchange best practices with the goal of being able to collaborate on air quality issues, rather than trying to each address them independently.

Air Quality Index (AQI) Values	Levels of Health Concern	Colors
When the AQI is in this range:	*..air quality conditions are:*	*...as symbolized by this color:*
0-50	Good	Green
51-100	Moderate	Yellow
101-150	Unhealthy for Sensitive Groups	Orange
151 to 200	Unhealthy	Red
201 to 300	Very Unhealthy	Purple
301 to 500	Hazardous	Maroon

GOAL TWO | OBJECTIVE ONE - THREE:

1) Implement program to inform public of fluctuating air quality by (date).
2) Encourage coordination within City government to implement policies related to air quality by (date).

"The quality of the air we breathe affects every person in Frederick."

GOAL TWO:

Develop comprehensive city-wide air quality strategy.

O-1:
Frederick Municipal Airport has one of just twenty-four air quality monitoring centers operating in the state of Maryland (Maryland Department of the Environment 2015). Yet with easy access to real-time data, the City has no program for informing the public about air quality levels. Rather than burdening Frederick's citizens with having to search for that information, the City will take steps to make that data readily accessible on a day-to-day basis.

The U.S. Environmental Protection Agency (EPA) tracks air quality fluctuations using the Air Quality Index (AQI), which monitors the five major airborne pollutants: particulate matter (PM10, PM2.5, and PM1), ozone, carbon monoxide, sulfur dioxide, and nitrogen dioxide (AirNow 2015). The AQI scale ranges from 0 to 500, 0-50 being the lowest level, indicating good air quality, and anything above 300 being the highest level, indicating hazardous air quality. A "Code Red" is the point at which the air is considered unhealthy. Code Red days indicate exceedances of ground level ozone standards, which means that fewer nitrogen oxides and volatile organic compounds are breaking down into ozone, which happens on particularly hot days. The Frederick County Sustainability Commission reported that there were no Code Red days in the County in the past ten years (Moore 2014).

Frederick will make air quality data available to the public in a variety of formats. First, functionality will be added to the City's website that will display realtime data gathered from the Frederick Municipal Airport. This data should refresh hourly to provide the most up-to-date information for Frederick's citizens. Second, the City will publish regular air quality reports using data gleaned from the airport as well as other sources. This report will provide both technical and historical data, but will also distill the data into accessible information for average citizen. Third, the City will establish an automated "Air Quality Hotline." The Hotline will allow residents to call in and receive realtime information relating to air quality. The City will also explore options for an automated text messaging alert system to inform citizens of poor air quality.

O-2:
Most departments within the government of Frederick have some connection to the city's air quality. For example, the Department of Planning can improve air quality through policies aimed at promoting public transportation. Similarly, the Department of Public Works can improve air quality by continuing to grow the city's urban canopy. While this plan enumerates many of the policies related to air quality, only through increased coordination can the City put forth a concerted effort to ensure clean air for all of Frederick's citizens.

To promote this coordination, the government will hold quarterly air quality meetings to be attended by the leadership of each respective agency. These meetings will serve to update agency leaders on program outcomes and best practices encountered by their colleagues. In addition, the meeting will promote a dialogue between agency executives, as well as encourage

3) Design air quality education program for Frederick's citizens by (date).

Frederick's officials to keep air quality a top government priority. In conjunction with this quarterly meeting, the sustainability coordinator will disseminate an internal tracking report that monitors the progress of various government policies and programs related to air quality. This report will stimulate discussion, in addition to providing a historical record of air quality policies in Frederick. Finally, these meetings will serve to pave the way for better communication and data-sharing between agencies within the Frederick government. Most agencies have some impact on air quality in some respect and they will work together to continue their successes in promoting healthy, breathable air for their citizens.

O-3:
The quality of the air we breathe affects every person in Frederick. In addition to the potential health impacts, air quality is an essential part of the thriving natural ecosystem that Frederick's citizens take pride in. The people of Frederick must be educated about air quality in order to take an active role in preserving it. Therefore, the government is prioritizing public education as a crucial component of its overall air quality strategy. Staff will organize educational events for the public designed to educate them about the impact of air quality on health and the steps they can take to improve air quality. These events will range from having an informational booth at fairs and festivals around Frederick to staff-led workshops and public meetings. In addition to events for the general public, the City will prioritize school-based outreach with staff give air quality presentations to local students. Finally, the City will work to form an air quality coalition of local business. These businesses will work together to educate their employees about air quality, as well as share useful information.

GOAL THREE | OBJECTIVE ONE - TWO:

1) Select case studies for further examination and determine if those case studies are applicable to Frederick by (date).

2) Use existing partnerships to encourage other cities to address air quality as part of their sustainability plans by (date).

CASE STUDY CITIES:

Newark, New Jersey

Sacramento, California

O-1:
Few cities have an air quality section within their own sustainability plans. Two cities that do have such sections are Newark, NJ and Sacramento, CA. While these are much larger cities than Frederick, some of the strategies in their plans (or other cites' plans) may be transferrable. The Newark and Sacramento plans should be examined and appropriate strategies for Frederick should be implemented.

O-2:
Few cities have an air quality section within their own sustainability plans. Two cities that do have such sections are Newark, NJ and Sacramento, CA. While these are much larger cities than Frederick, some of the strategies in their plans (or other cites' plans) may be transferrable. The Newark and Sacramento plans should be examined and appropriate strategies for Frederick should be implemented.

GOAL THREE:

Implement strategies used by other cities to mitigate pollution and improve air quality.

GOALS, OBJECTIVES AND ACTIONS SUMMARY TABLE

Goal 1: Continue Regional Collaboration
Objective 1: Maintain and strengthen existing partnerships with neighboring jurisdictions and organizations such as the MWCOG
1.1.1 Continue to take part in and promote the MWCOG-sponsored programs, such as Clean Air Partners, that work to improve the region'
1.1.2 Continue to adhere to the regulations laid out in MWCOG's State Implementation Plan (SIP)
Objective 2: Explore new partnerships with jurisdictions and governmental councils and establish such partnerships where appropriate.
1.21 Establish relationships with neighboring non-member MWCOG jurisdictions and governmental councils
1.2.2 Explore which jurisdictions to the west of Frederick are logical partners for air quality collaboration, as airborne pollutants originate t
Objective 3: Implement regional data sharing and exchange of best practices from other jurisdictions by (date.)
1.3.1 Hold semi-annual meetings with regional and other partners to compare data and share best practices in addressing air quality issue
Goal 2: Develop Comprehensive Citywide Air Quality Strategy
Objective 1: Implement Program to Inform Public of Fluctuating Air Quality by (date.)
2.1.1 Add functionality to City of Frederick's government website that reports real-time data on air quality fluctuations.
2.1.2 Publish annual report on air quality using information obtained from the monitoring station at Frederick Municipal Airport and other
2.1.3 Establish "Air Quality Hotline" that citizens can telephone to receive up-to-date air quality information.
Objective 2: Encourage coordination within City government to implement policies related to air quality by (date.)
2.2.1 Schedule quarterly meetings on air quality to be attended by the leadership of all government agencies.
2.2.2 In conjunction with quarterly meeting, disseminate internal tracking report that monitors progress of all government policies and pr
2.2.3 Encourage data-sharing between agencies as needed.
Objective 3: Design Air Quality Education Program for Frederick's Citizens by (date.)
2.3.1 Organize educational events for the public designed to educate about the impact of air quality on health and the steps individuals ca
2.3.2 Conduct school-based outreach.
2.3.3 Conduct outreach to local business to form an Air Quality Coalition.
Goal 3: Implement strategies used by other cities to mitigate pollution and improve air quality
Objective 1: Select case studies for further examination and determine if those case studies are applicable to Frederick by (date.)
3.1.1 Select case studies for further examination and determine if those case studies are applicable to Frederick by
Objective 2: Use existing partnerships to encourage other cities to address air quality as part of their sustainability plans by (date.)
3.2.1 Through existing partnerships, encourage other MWCOG member jurisdictions that do not address air quality as part of their sustaina
3.2.2 Through existing or new partnerships as outlined in the previous goal, coordinate Frederick's air quality policies with states, counties

	TIMEFRAME	LEAD AGENCY
's air quality.	Ongoing	(INSERT APPROPRIATE AGENCY)
	Ongoing	(INSERT APPROPRIATE AGENCY)
	Short-term	(INSERT APPROPRIATE AGENCY)
o Frederick's west and then travel eastward towards Frederick.	Short-term	(INSERT APPROPRIATE AGENCY)
s.	Short-term	(INSERT APPROPRIATE AGENCY)
	Short-term	(INSERT APPROPRIATE AGENCY)
r sources.	Mid-term	(INSERT APPROPRIATE AGENCY)
	Short-term	(INSERT APPROPRIATE AGENCY)
	Short-term	(INSERT APPROPRIATE AGENCY)
ograms related to air quality.	Short-term	(INSERT APPROPRIATE AGENCY)
	Short-term	(INSERT APPROPRIATE AGENCY)
an take to improve air quality.	Short-term	(INSERT APPROPRIATE AGENCY)
	Short-term	(INSERT APPROPRIATE AGENCY)
	Mid-term	(INSERT APPROPRIATE AGENCY)
	Ongoing	(INSERT APPROPRIATE AGENCY)
ability plans or environmental policies to do so.	Short-term	(INSERT APPROPRIATE AGENCY)
s, and cities to the west of Frederick where and when appropriate.	Mid-term	(INSERT APPROPRIATE AGENCY)

4 | Urban Canopy

Introduction

Goals:

1. Increase tree canopy in Frederick in order to provide habitat, reduce heat island effects, and improve air quality.
2. Ensure that green spaces are connected.
3. Ensure that adequate green space and recreational facilities exist to meet need.
4. Ensure that trees and urban space remain healthy and well-maintained.

Both tree canopy and open spaces are vital to a healthy and sustainable city. However, finding a sustainable balance between these two necessities can be a challenge, especially in a city as dynamic as Frederick. The City is tasked with maintaining the balance of open and green spaces for sports and leisure, increasing canopy coverage, and providing space for community gardens while also fitting these uses into an increasingly developed built environment.

According to a 2009 urban tree canopy study, only 14 percent of Frederick is forested, which is significantly less than the City's goal of 40 percent. This percentage is especially critical when considering the many benefits of trees such as cleaning the air by capturing particulate matter, taking in carbon dioxide, absorbing excess nutrients through their root systems, and helping to curb the urban heat island effect, among other benefits.

The City is planting canopy in passive parks and along stream corridors, but there is not enough public land to meet the goal. Planting on private property and privately held community green space is vital to achieving 40 percent canopy cover. A heavy focus should be placed on residential areas as they have the greatest density of existing canopy and the most potential for additional canopy. In tandem with tree canopy, the City's parks also provide benefits. The City supports 72 parks, a total of about 677 acres of green space. Park space as a proportion of a NAC's area varies from three to 12 percent. About 624 of those acres are maintained in some way, providing opportunities for organized sports, gathering spots for events, and other leisure activities, all of which must continue to support increased health and wellness for all of Frederick's residents.

Successes to Date:

1. In 2014, the City launched a pilot inventory effort for homeowners, focused on a specific neighborhood advisory council (NAC) area. The effort will help the City learn about canopy diversity and will educate homeowners about the importance of urban tree canopy on public and private lands. After assessing the collected data, the inventory project may expand to inventory other NACs.
2. The City is finalizing the bid package for contracting the Phase I Stormwater Management Plan of Culler Lake in Baker Park. The project includes dredging, installing gravel wetlands and mechanical systems to remove nutrients and sediments, replacing the east wall, and reconstructing the iconic wedding cake fountain.
3. Understanding the importance of public open space adjacent to the historic district, the City is in the process of expanding the Carroll Creek promenade to East Frederick.
4. Sterling Level Tree City USA and the oldest Tree City in Maryland.

1 Goal: Increase tree canopy in Frederick in order to provide habitat, reduce heat island effects, and improve air quality.

Why?

ECONOMY

Commercial areas with extensive tree canopies attract businesses and provide places for shoppers and pedestrians to linger. Residential areas with tree-lined streets are more desirable to buyers and can in some cases can demand additional value. Tree canopies can also help to insulate buildings in hotter months and can significantly reduce cooling costs.

ENVIRONMENT

Trees help to filter air and remove hazardous greenhouse gases (GHG) out of the atmosphere. A more extensive tree canopy network can work to maximize the natural process.

EQUITY

An extensive tree canopy throughout all of Frederick's neighborhoods provides environmental and economic benefits to all residents. All residents in the city deserve access to clean air.

Potential Challenges with Goal 2:

Getting buy-in from utility companies.

Developers have little incentive to plant/maintain trees of high quality (cost prohibitive).

Homeowner lack of interest in public realm tree maintenance.

Lack of necessary involvement in some NACs.

Objective 1:

Meet the City's goal to increase Frederick's urban tree canopy (UTC) to (percent) from the current 14 percent by (year).

Frederick's Urban Tree canopy is significantly lower than most of its state-level peer cities, and is much lower than the percentage that experts recommend.

Actions:

1. Adopt a city tree coupon program to match the state's pre-existing Marylanders Plant Trees $25 coupon program to further assist private property owners in planting more trees.

   Short-term ***Agency**: (INSERT APPROPRIATE AGENCY)*

2. Host competitions between NACs as to which NAC can increase tree canopy by the greatest percentage.

   Short-term ***Agency**: (INSERT APPROPRIATE AGENCY)*

3. Create UTC percentage increase competitions between state sister cities to further promote tree planting.

   Mid-term ***Agency**: (INSERT APPROPRIATE AGENCY)*

1 Goal: Increase tree canopy in Frederick in order to provide habitat, reduce heat island effects, and improve air quality.

Objective 3:

Make sure that all of Frederick's UTC include high quality, non-invasive, hardy that are well maintained by (date).

Non-native trees might be nice to look at, but can sometimes cause unnecessary damage to surrounding species or can deplete water or other resources. In addition, some non-native trees can be cheaper to purchase and plant, but are not suited to survive for long periods in the city's climate. The City and its private sector should always strive to plant and maintain non-invasive, hardy trees to maintain a healthy tree canopy.

Actions:

1. Although Frederick County has a forest conservation ordinance, the legislation only applies to unincorporated areas and therefore does not apply to the City. The City should follow the County and introduce a tree protection ordinance.

   Short-term ***Agency**: (INSERT APPROPRIATE AGENCY)*

2. Establish and adopt tree preservation guidelines for City-owned property and developers of private property.

   Short-term ***Agency**: (INSERT APPROPRIATE AGENCY)*

3. Adopt a policy and update code to require a minimum of 85 percent native species with zero invasive species planted in commercial and City plantings.

   Short-term ***Agency**: (INSERT APPROPRIATE AGENCY)*

4. Continue to develop city-wide education program about the value of trees.

   Short-term ***Agency**: (INSERT APPROPRIATE AGENCY)*

5. Establish a City-wide annual bird count to provide data about the health of parks and open spaces that have been designated by the City as at risk bird habitats.

   Short-term ***Agency**: (INSERT APPROPRIATE AGENCY)*

2 Goal: Ensure that green spaces are connected.

Why?

ECONOMY

Recreational linkages for pedestrians can promote economic vitality through increased foot traffic in underserved commercial areas.

ENVIRONMENT

Greenways create opportunities to improve air and water quality while creating linkages for wildlife through otherwise unfriendly urban environments.

EQUITY

Greenways create public linkages for all residents of the City while promoting local fitness, as well as potentially increasing the City's walkability score.

Potential Challenges with Goal 2:

Lack of public funding to acquire land.

Lack of City staff to maintain increased public spaces.

Loss of tax base if too much conversion of residential land to public land.

Objective 1:

Create (number) of green spaces that are connected to each other as well as natural habitats via greenways by (date).

Not only are disconnected natural habitats or green spaces bad for safe/healthy movements of wildlife within the city, poor pedestrian connectivity to green space inhibits Frederick's citizens from accessing and enjoying recreation within their parks.

Actions:

1. Identify greenways and create a greenway plan - map out potential connections between open space areas and other public properties. Set priorities for incremental improvement of the connections.

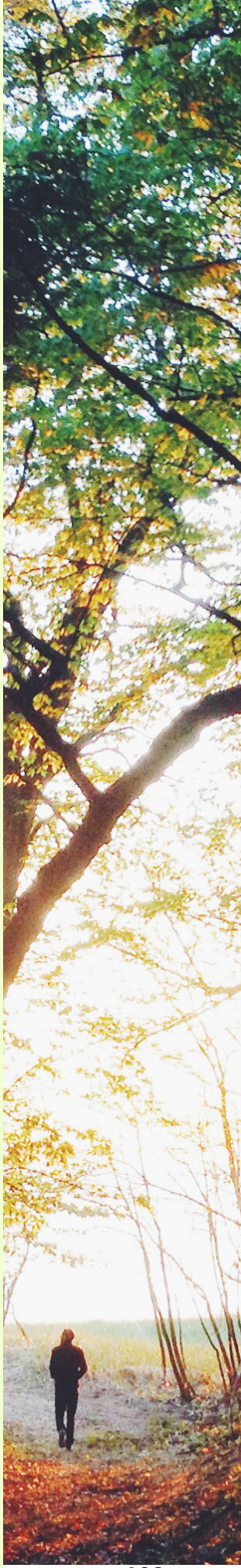
   Mid-term **Agency**: *(INSERT APPROPRIATE AGENCY)*

2. With ecology specialists, prepare a city-wide assessment and map of essential habitat connections using best available science, ecological data, and spatial analyses. The map will be used to inform policy for integrating habitats and green space into future development projects throughout the city.

   Mid-term **Agency**: *(INSERT APPROPRIATE AGENCY)*

3. Prepare an open space plan to increase residential connections to green space.

   Mid-term **Agency**: *(INSERT APPROPRIATE AGENCY)*



3 Goal: Ensure that adequate green space and recreational facilities exist to meet need.

Why?

ECONOMY

Researchers across the world have found that urban green space and parkland increase property values and provide economic benefits for their communities.

ENVIRONMENT

Urban parkland and green space provide opportunities for outdoor recreation and physical activity. This in turn helps improve fitness and--because they are public and open to all—reduce disparities in health between the affluent and the impoverished.

EQUITY

Providing green space throughout a city reduces the need for residents to travel long distances to engage in outdoor recreation. This reduces traffic levels, greenhouse gas emissions, and supports communities by offering local gathering places.

Potential Challenges with Goal 3:

Developers and owners of developable land are likely to be opposed to any actions that will decrease the value of their land (such as requiring larger areas to be reserved as open space) or any additional development fees or requirements (such as those that would be imposed by inclusion of park and recreation facilities in the APFO). Outreach to these stakeholders—to balance the additional costs of these requirements with the community benefits of additional open space—will be essential for successful implementation of these requirements.

Some taxpayers may be opposed to expense of City funds for purchase of parkland or development of park amenities. Outreach to the public, discussing the economic, social, and environmental benefits of parkland, will help mitigate this criticism.

Objective 1:

Ensure that recreation facilities and open space continually meet needs of population growth.

Frederick anticipates significant population growth. This population growth while create additional need for recreation facilities and park space while reducing the land available for those spaces. Therefore, it is important to ensure continual growth in park and recreation facilities at a rate appropriate for population growth.

Actions:

1. The City's Adequate Public Facilities Ordinance (APFO) should be revised to include parks as a public facility.

Short-term **Agency**: *(INSERT APPROPRIATE AGENCY)*

2. If parcels appropriate for use as recreational facilities or open space are identified through the planning process, the City should purchase those properties or pursue a conservation easement for them, depending on the intended use of the property.

Ongoing **Agency**: *(INSERT APPROPRIATE AGENCY)*

Objective 2:

(Percentage) of residents have access to parkland or natural space within a 10-minute walk by (year).

Interaction with nature is a human need, called biophilia, and it is therefore important to ensure that all Frederick residents have access to green space and parkland. Making sure that such spaces are distributed throughout the city and accessible by foot will reduce parks' impact on traffic and allow those who do not drive to access parks and nature.

Actions:

1. Require that all new developments of a certain size include green space that will be open to the public or preserved in its natural state.

   Mid-term **Agency**: *(INSERT APPROPRIATE AGENCY)*

2. Seek input from various user groups and community populations on their recreation needs, as well as continue to conduct observational studies of recreational facility use.

   Ongoing **Agency**: *(INSERT APPROPRIATE AGENCY)*

3. Create an inclusive organizational system that empowers citizens to be stewards of public spaces.

   Short-term **Agency**: *(INSERT APPROPRIATE AGENCY)*

4. The City should develop spaces identified for recreation with courts, fields, and playgrounds, as appropriate for the community.

   Ongoing **Agency**: *(INSERT APPROPRIATE AGENCY)*

5. Conduct observational studies of recreational facility use.

   Short-term **Agency**: *(INSERT APPROPRIATE AGENCY)*

6. Conduct an inventory and assessment of potential outdoor recreation spaces.

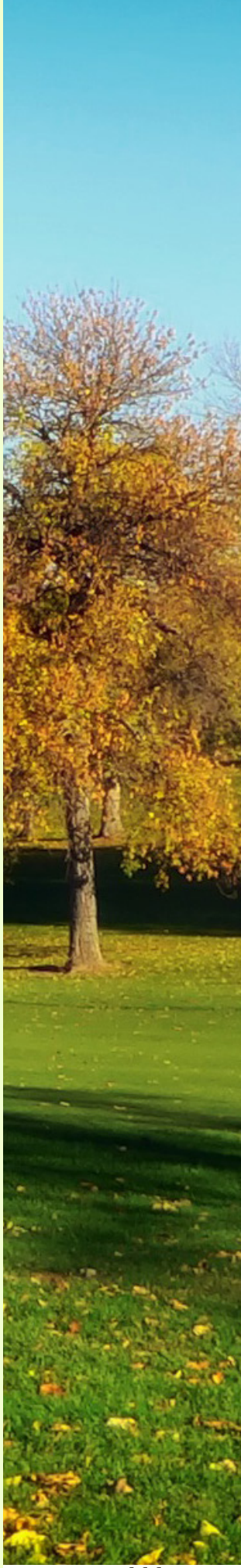
   Short-term **Agency**: *(INSERT APPROPRIATE AGENCY)*

7. Develop a plan with recommendations for increasing the quantity, quality, and use of recreation spaces.

   Mid-term **Agency**: *(INSERT APPROPRIATE AGENCY)*

8. Supplement the existing open space plan, with special emphasis on increasing connections between residential areas and open space.

   Mid-term **Agency**: *(INSERT APPROPRIATE AGENCY)*



4 Goal: Ensure that trees and urban space remain healthy and well-maintained.

Why?

ECONOMY

Time, money, and effort spent on planting trees and creating green urban spaces is wasted if those trees and urban spaces are not kept healthy through appropriate maintenance and continued stewardship.

ENVIRONMENT

Healthy trees and urban green spaces are home to more productive ecosystems, provide better filtration of pollutants, and provide better habitat for wildlife.

EQUITY

Parks and recreational spaces provide the most benefits for their users if they are kept well and their facilities are in good working order, and inclusion of the public in the upkeep of trees and parks both reduces City costs and cultivates a sense of ownership and responsibility among citizens.

Potential Challenges with Goal 4:

Existing City employees may object to the hiring of young people for tree and park maintenance during the summer months instead of using full-time employees for this work. Outreach to these employees, emphasizing that work done by the summer youth employees is of a different nature than the work done by full-time maintenance staff, will be essential in mitigating this challenge.

Some taxpayers may be opposed to expense of City funds for the maintenance of trees and may be opposed to expending the level of funding required for park maintenance to meet its objectives. Outreach to the public, discussing the economic, social, and environmental benefits of healthy trees and well-kept parks, will help mitigate this criticism.

Objective 1:

Ensure 100 percent of existing urban canopy remains intact, with an average street tree lifetime of at least 20 years.

Maintaining urban tree canopy is critical to ensuring that urban trees will continue to provide benefits to Frederick. Therefore, it is important to ensure that existing trees last as long as possible, and that they are replaced if necessary.

Actions:

1. Include a line item for tree maintenance in its budget.

   Short-term **Agency**: *(INSERT APPROPRIATE AGENCY)*

2. Create a "Treekeepers" program to empower residents to care for the trees in their neighborhood.

   Mid-term **Agency**: *(INSERT APPROPRIATE AGENCY)*

3. Implement sustainable landscape maintenance practices.

   Mid-term **Agency**: *(INSERT APPROPRIATE AGENCY)*

4. Partner with local nurseries to implement this objective.

   Mid-term **Agency**: *(INSERT APPROPRIATE AGENCY)*

Objective 2:

Maintain existing park and recreation levels of service without an increase in cost.

Parkland and recreation facilities provide numerous services and community benefits. These benefits can best be realized if the facilities are kept in good working order and parklands are properly maintained.

Actions:

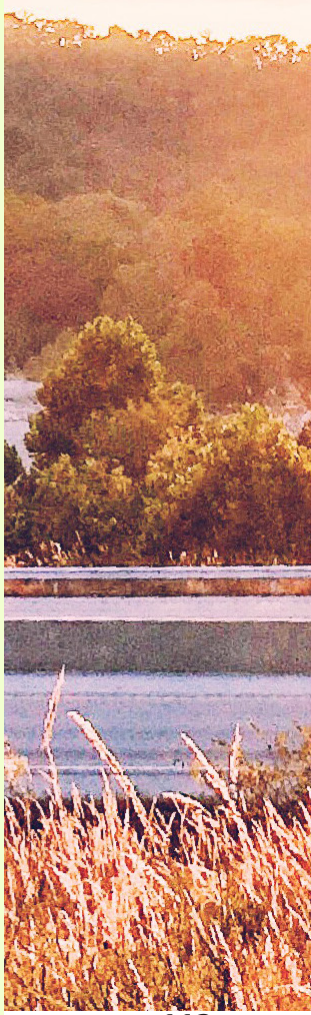
1. Establish a summer youth employment program.

   Short-term **Agency**: *(INSERT APPROPRIATE AGENCY)*

   This program would hire Frederick resident students and young people to participate in tree maintenance and park upkeep.

2. Invest in purchasing or renting a municipal goat herd for grazing and maintenance of areas and use vinegar instead of pesticides to maintain municipally owned grass areas throughout Frederick.

   Mid-term **Agency**: *(INSERT APPROPRIATE AGENCY)*



URBAN CANOPY ANALYSIS

The following pages are in-depth analyses of each goal and objective - detailing case studies, best practices, and implementation methods. It is meant to be supplementary material that can guide Frederick.

GOAL ONE | OBJECTIVE ONE - TWO:

1) Meet the City's goal to increase Frederick's urban tree canopy (UTC) to (percent) from the current 14 percent by (year).

CASE STUDY:
Los Angeles, CA

One great example of this is Los Angeles' Tree People organization, a non-profit organization, which was incorporated in 1973 to plant trees in the Los Angeles County. Over the past forty years, the organization has expanded with a mission "to grow a greener, shadier and more water-secure city at homes, neighborhoods, schools and in the local mountains. [It] work[s] with volunteer leaders using [the] Citizen Forester model, and influence[s] government agencies for a healthy, thriving Los Angeles" (Tree People 2015).

GOAL ONE:

Increase tree canopy in Frederick in order to provide habitat, reduce heat island effects, and improve air quality.

The economic reason for increasing Frederick's tree canopy are that commercial areas with extensive tree canopies attract businesses and provide places for shoppers and pedestrians to linger (Southworth 2005). Residential areas with tree-lined streets are more desirable to buyers and can in some cases demand additional value (Donovan and Butry 2010). Tree canopies can also help to insulate buildings in hotter months and can significantly reduce cooling costs. Environmentally, trees help to filter air and remove hazardous greenhouse gases (GHG) out of the atmosphere. A more extensive tree canopy network can work to maximize the natural process. In terms of equity, an extensive tree canopy throughout all of Frederick's neighborhoods provides environmental and economic benefits to all residents. All residents in the city deserve access to clean air.

O-1:
In order to ensure that Frederick's tree canopy is well maintained and not destroyed, the City must establish and adopt tree preservation guidelines for City-owned property and developers of private property. The appropriate responsible agencies for implementing this action are the Board of Aldermen and the Parks and Recreation Department. This action should be implemented within a short-term timeframe due to the importance of securing a healthy and protected urban tree canopy.

The City of Frederick should create an adopt a city tree coupon program to match the state's pre-existing Marylanders Plant Trees $25 coupon program to further assist private property owners in planting more trees. This incentive matching program could greatly increase tree planting of pre-approved local tree plantings on private property in the city. This action will greatly increase Frederick's tree canopy as most of the additional trees that can be planted within the city are on land that is private. The appropriate responsible agencies to implement this action are the Board of Aldermen and the Department of Parks and Recreation. Potential partner agencies of this action could be Marylanders Plant Trees and Frederick County. The timeframe for this action is deemed medium-term as funds might not currently be available. Nonetheless, the District of Columbia has established a successful partnership with Casey Trees, a non-profit organization. Casey Trees has a tree rebate program that will reimburse any residential or commercial property owner up to $100 for each tree planted (Casey Trees n.d.).

As a way to promote community spirit and the expansion of Frederick's urban tree canopy, the City should host competitions between NACs as to which NAC can increase tree canopy by the greatest percentage. Potential responsible agencies to implement this action are the Board of Aldermen and Department of Parks and Recreation. Neces-

2) Make sure that all of Frederick's UTC include high quality, non-invasive, hardy that are well maintained by (date).

sary partnering agencies would be the Frederick City NACs. The timeframe for this action is deemed short-term.

The City should not only focus within its boundaries for good example of expanding urban tree canopies when many of its Sister Cities around the world could be implementing great strategies to increase their own tree canopies. In order the potentially take advantage of other creative strategies, the City should create Urban Tree Canopy percentage increase competitions between state sister cities to further promote tree planting. The appropriate responsible agency to implement this strategy is the Board of Aldermen. Appropriate partnering agencies for this action are Marylanders Plant Trees as well as Frederick's sister cities governments. The timeframe for this action is deemed medium-term.

While competitions are events that promote creative ways to increase the city's tree canopy, Frederick should still continue to develop more city-wide education programs about the value of trees. An appropriate responsible agency to implement this action is the Department of Parks and Recreation. Appropriate partner agencies for this action could be the Frederick County Public Schools and Marylanders Plant Trees. The timeframe for this action is deemed to be short-term.

O-2:
In order to maintain an urban tree canopy that is suited for Frederick's geography and also will not disrupt the Frederick's natural ecosystem, the City should adopt a policy and update its landscape code to require a minimum of 85 percent native species with zero invasive species planted in commercial and city plantings. The appropriate responsible agencies are the Board of Aldermen and the Planning Department. The timeframe for this action's implementation is deemed short-term.

The City should establish a city-wide annual bird count to provide data about the health of parks and public open spaces that have been designated by the City as at risk bird habitats. A responsible agency to implement this action is the Parks and Recreation Department with a potential partnering agency being the Frederick Bird Club. The timeframe for this action is deemed short-term.

According to Frederick's previous tree canopy analysis, tree canopy was especially scarce nearest Frederick's largest highways and interstates. This is a significant problem considering the amount of GHG that are emitted from vehicular traffic driving on these roadways. Therefore, the City should focus tree plantings, if possible, in proximity to US-15, I-70, and I-270, to increase filtering of airborne pollutants from traffic while working with the State Highway Administration (SHA). Appropriate responsible agencies for such a task are the Department of Transportation. The timeframe to complete this action is medium-term.

In order to better advise the City as to where new tree plantings should be conducted on public property, the City should create an urban forestry administration or advisory group comprised of relevant community members and stakeholders to review prime planting locations for trees across all neighborhoods. Including a diverse range of members can better reflect the interests of the City and its residents. The appropriate responsible agency to fulfill this action is the Parks and Recreation Department. The timeframe is deemed "short-term" due to its relative ease to complete.

Measurement of Progress:
Indicators
- Number of trees planted per year
- Tree canopy coverage

Benchmarks
- Target: (determine based on 40 percent goal year)

Potential Challenges:
- Getting buy-in from utility companies
- Developers have little incentive to plant/maintain trees of high quality (cost prohibitive)
- Homeowner lack of interest in public realm tree maintenance
- Lack of necessary involvement in some NACs

GOAL TWO | OBJECTIVE ONE:

1) Create (number) of green spaces that are connected to each other as well as natural habitats via greenways by (date).

"Greenways can create public linkages for all residents of the City while promoting local fitness."

There are many benefits to making sure that green spaces are connected in the City of Frederick. In economic terms, establishing recreational linkages for pedestrians can promote economic vitality through increased foot traffic in underserved commercial areas. Environmentally, there are many benefits to establishing greenways such as creating opportunities to improve air and water quality while creating linkages for wildlife through otherwise unfriendly urban environments. In terms of social equity, greenways can create public linkages for all residents of the city while promoting local fitness, as well as potentially increasing the city's walkability score.

O-1:
The City of Frederick should identify greenways and create a greenway plan and map out potential connections between open space areas and other public properties. Such an action is important to make because this begins to set priorities for incremental improvement of the connections based on when funding and/or land becomes available. The appropriate responsible agencies for this action are the Planning Department and Parks and Recreation Department. Some potential partner agencies could be the Friends of Baker Park and Friends of Waterford Park. The designated timeframe for the implementation of this action is "medium-term."

With ecology specialists, the City should prepare a city-wide assessment and map of essential habitat connections using best available science, ecological data, and spatial analyses. The map could then be used to inform policy for integrating habitats and green space into future development projects throughout the city. Appropriate responsible agencies are the Planning Department and the Parks and Recreation Department. A potential partner agency could be Hood College Center for Coastal and Watershed Studies. The designated timeframe for implementing this action is "medium-term."

To further support the greenway plan and map of essential habitat connections, the City should also prepare an open space plan to increase more residential connections to green space to further build upon social equity and access to green and open space. Appropriate responsible agencies for this actions are the Planning Department and the Parks and Recreation Department. Potential partner agencies could be Neighborhood Advisory Councils (NACs). The timeframe for this action is deemed to be "medium-term."

Measurement of Progress:

Indicators:
- Square acres of greenway created per year
- Proportion of connected green spaces versus disconnected green spaces

Benchmarks:
- Two acres of new greenway links identified or built each year.

Potential Challenges:
- Lack of public funding to acquire land.
Lack of City staff to maintain increased public spaces.
- Loss of tax base if too much conversion of residential land to public land.

GOAL TWO:

Ensure that green spaces are connected.

GOAL THREE | OBJECTIVE ONE - TWO:

1) Ensure that recreation facilities and open space continually meet the needs of population growth.

"Providing green space throughout a city reduces the need for residents to travel long distances to engage in outdoor recreation."

GOAL THREE:

Ensure that adequate green space and recreational facilities exist to meet need.

Green space and recreation facilities are important assets to communities. In terms of economics, researchers across the world have found that urban green space and parkland increase property values and provide economic benefits for their communities (Fausold and Lilieholm 1999). In terms of social equity, urban parkland and green space provide opportunities for outdoor recreation and physical activity (McConnell and Walls 2005). This in turn helps improve fitness and--because they are public and open to all—reduce disparities in health between the affluent and the impoverished (Perino, et al. 2014). Environmentally, providing green space throughout a city reduces the need for residents to travel long distances to engage in outdoor recreation. This reduces traffic levels, greenhouse gas emissions, and supports communities by offering local gathering places (Pandit, Polyakov and Sadler 2012).

O-1:
The City's Adequate Public Facilities Ordinance (APFO) should be revised to include parks as a public facility. This is done in other Maryland communities including Union Bridge, Taneytown, Mount Airy, Laurel, and Annapolis. The responsible agency for this action is the Board of Aldermen. An appropriate timeframe for this action is "short-term."

The City should require that all new developments of a certain size include green space that will be open to the public or preserved in its natural state. The responsible agency to accomplish this action is the Board of Aldermen. The appropriate designated timeframe is "medium-term."

The City should develop public open spaces identified for recreation with courts, fields, and playgrounds, as appropriate for the community. Park design should be selected through a public design competition. An appropriate responsible agency to implement this action is the Parks and Recreation Department. The designated timeframe to implement this action is "medium-term."

The City should determine current and potential use levels for existing publicly owned outdoor spaces, and develop a plan to maximize usage of these spaces. An appropriate responsible agency for this action is the Parks and Recreation Department. An appropriate designated timeframe for this action is "short-term."

The City should prepare an open space plan, with special emphasis on increasing connections between residential areas and open space. The appropriate responsible agency to achieve this action is the Planning Department. The designated timeframe to

accomplish this action is "medium-term."

O-2:
If parcels appropriate for use as recreational facilities or open space are identified through the planning process, the City should purchase those properties or pursue a conservation easement for them, depending on the intended use of the property. The appropriate responsible agencies to implement this action are the Parks and Recreation Department, Facilities Administration Department and the Board of Aldermen. The designated timeframe is "ongoing."

The City should create an inclusive organizational system that empowers citizens to be stewards of public spaces. Appropriate responsible agencies to accomplish this action are the Parks and Recreation Department and the Board of Aldermen. A designated appropriate timeframe to implement this action is "short-term."

The City should seek input from various user groups and community populations on their recreation needs, as well as continue to conduct observational studies of recreational facility use. In addition, the City should create targeted programming to increase participation in youth and adult recreation programs. The appropriate responsible agency to implement this action is the Parks and Recreation Department. The deemed timeframe for accomplishing this action is "Ongoing."

The City should conduct an inventory and assessment of potential outdoor recreation spaces, and develop a plan with recommendations for increasing the quantity, quality, and use of recreation spaces. An appropriate responsible agency to implement this action is the Parks and Recreation Department. An appropriate timeframe to accomplish this action is "short-term."

Measurement of Progress:

Indicators:

- Acres of new recreation area and open space per year.

- Park usage rates as determined by an annual survey.

Benchmarks:

- Recreation and open area is continually adequate for population growth.

- By 2035, all residents have access to parkland or natural space within a 10-minute walk.

Potential Challenges:

Developers and owners of developable land are likely to be opposed to any actions that will decrease the value of their land (such as requiring larger areas to be reserved as open space) or any additional development fees or requirements (such as those that would be imposed by inclusion of park and recreation facilities in the APFO). Outreach to these stakeholders—to balance the additional costs of these requirements with the community benefits of additional open space—will be essential for successful implementation of these requirements.
Some taxpayers may be opposed to expense of City funds for purchase of parkland or development of park amenities. Outreach to the public, discussing the economic, social, and environmental benefits of parkland, will help mitigate this criticism.

GOAL FOUR | OBJECTIVE ONE - TWO:

1) Ensure 100 percent of existing urban canopy remains intact, with an average street tree lifetime of at least 20 years.
2) Maintain existing park and recreation levels of service without an increase in cost.

GOAL SUMMARY:

Time, money, and effort spent on planting trees and creating green urban spaces is wasted if those trees and urban spaces are not kept healthy through appropriate maintenance and continued stewardship. For example, appropriately timed pruning without complete removal is both healthy for street trees and reduces their impacts on power and telephone lines. Similarly, green spaces that are kept healthy are more effective at providing wildlife habitat, reducing the need for further land purchases in the future. In addition, Parks and recreational spaces provide the most benefits for their users if they are kept well and their facilities are in good working order, and inclusion of the public in the upkeep of trees and parks both reduces City costs and cultivates a sense of ownership and responsibility among citizens.

GOAL FOUR:

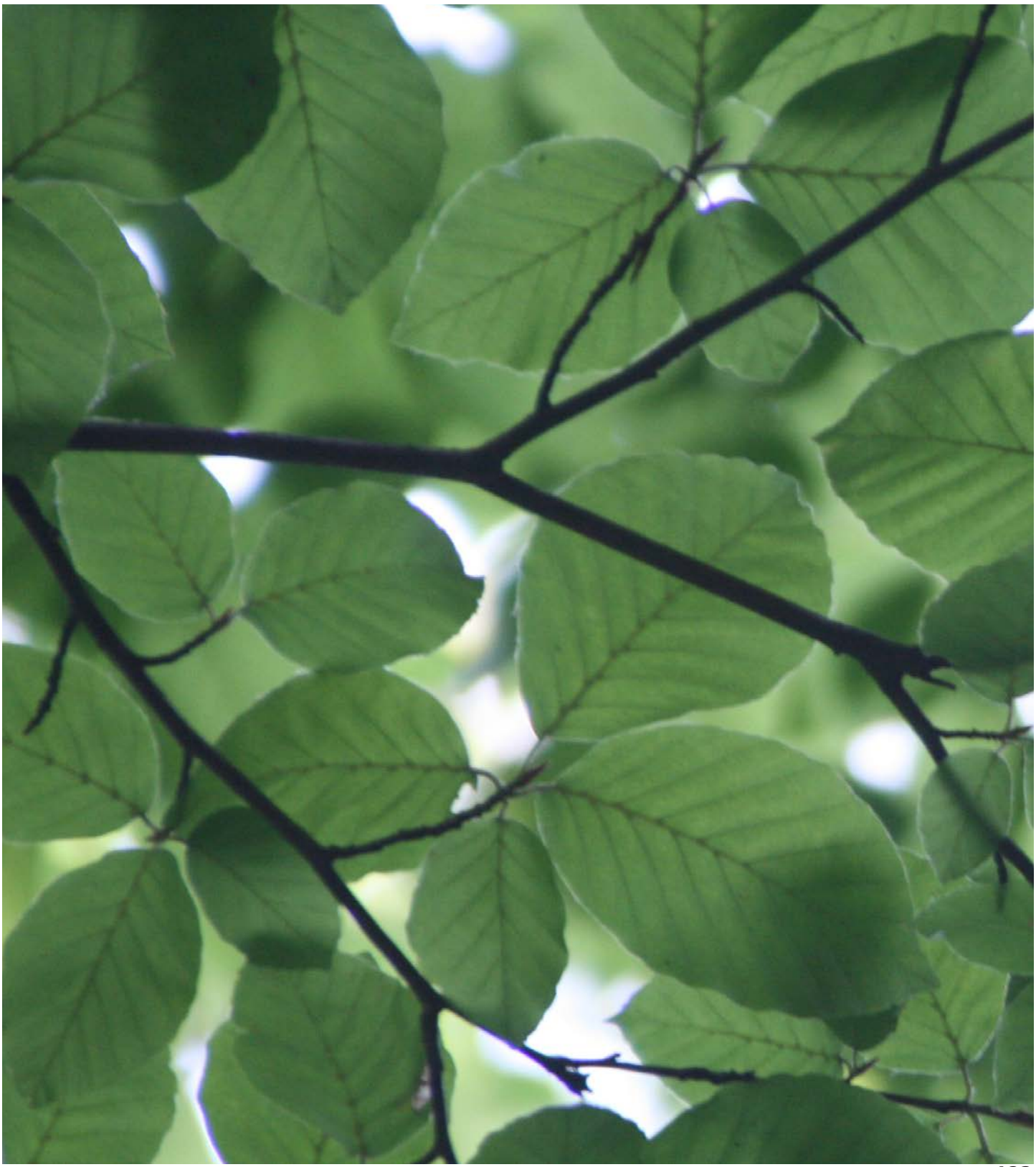
Ensure that trees and urban space remain healthy and well maintained.

O-1:
The City should create a "Treekeepers" program to empower residents to care for the trees in their neighborhood. Education about proper tree maintenance techniques will allow these "Treekeepers" to care for the trees themselves, as well as educate others, thus reducing ongoing maintenance costs for the city while increasing civic participation in the City's tree program. The appropriate responsible agency to implement this action is the Board of Aldermen. The appropriate designated timeframe to implement this action is "short-term." Education about proper tree maintenance techniques will allow these "Treekeepers" to care for the trees themselves, as well as educate others, thus reducing ongoing maintenance costs for the city while increasing civic participation in the City's tree program. The City should promote local nurseries and encourage them to sell native trees and shrubs. In addition, the City should partner with nurseries to reach out to the public about proper tree maintenance, as well as reach potential new Treekeepers. The appropriate responsible agencies to implement this action are the Department of Economic Development and the Board of Aldermen. The designated timeframe to accomplish this action is "short-term."

O-2:
The City should include a line item for tree maintenance in its budget. This money will go specifically towards servicing existing trees rather than planting new ones. An appropriate responsible agency to implement this action is the Board of Aldermen. The designated appropriate timeframe to implement this action is "ongoing."
The City should establish a summer youth employment program, hiring Frederick resident youths to participate in tree maintenance and park upkeep. This will have the dual benefits of maintaining trees and parks as well as educating youth about proper tree and landscape maintenance practices. The appropriate responsible agencies to implement this action are the Parks and Recreation Department and the Board of Aldermen. An appropriate timeframe to implement this action is "medium-term."
The City should invest in purchasing or renting a municipal goat herd and use vinegar as opposed to pesticides to maintain municipally owned grass areas throughout Frederick. Using goat herds reduce GHG emissions otherwise released by industrial lawn mowers, while vinegar is a more environmentally friendly alternative to pesticides (Booth and Skelton 2009). The City of Seattle, Washington has had great success with hiring its own goatherds to clear public right-of-way grass that is located on dangerous steep terrain (Harrell 2006). Seattle uses its goat rental program to use goats to clear invasive species from public lands as well. Not only does the city find goats to be more environmentally friendly than other tools, but also more cost-effective. The appropriate responsible agencies to implement this action are the Parks and Recreation Department, the Facilities Department and the Department of Public Works. The appropriate designated timeframe to implement this action is "short-term."

Potential Challenges:
Existing City employees may object to the hiring of young people for tree and park maintenance during the summer months instead of using full-time employees for this work. Outreach to these employees, emphasizing that work done by the summer youth employees is of a different nature than the work done by full-time maintenance staff, will be essential in mitigating this challenge.

Some taxpayers may be opposed to expense of City funds for the maintenance of trees and may be opposed to expending the level of funding required for park maintenance to meet its objectives. Outreach to the public, discussing the economic, social, and environmental benefits of healthy trees and well-kept parks, will help mitigate this criticism.



GOALS, OBJECTIVES AND ACTIONS SUMMARY TABLE

Goal 1: Increase tree canopy in Frederick in order to provide habitat, reduce heat island effects, and improve air quality.	
Objective 1: Meet the City's goal to increase Frederick's urban tree canopy (UTC) to 40 percent from the current 14 percent by (year).	
1.1.1	Adopt a city tree coupon program to match the state's pre-existing Marylanders Plant Trees $25 coupon program to further assist p
1.1.2	Host competitions between NACs as to which NAC can increase tree canopy by the greatest percentage.
1.1.3	Create UTC percentage increase competitions between state sister cities to further promote tree planting.
Objective 2 : Make sure that all of Frederick's UTC include high quality, non-invasive, hardy that are well maintained by (date.)	
1.2.1	Although Frederick County has a forest conservation ordinance, the legislation only applies to unincorporated areas and therefore c
1.2.2	Establish and adopt tree preservation guidelines for City-owned property and developers of private property.
1.2.3	Adopt a policy and update code to require a minimum of 85 percent native species with zero invasive species planted in commercia
1.2.4	Continue to develop city-wide education program about the value of trees.
1.2.5	Establish a City-wide annual bird count to provide data about the health of parks and open spaces that have been designated by th
Goal 2: Ensure that green spaces are connected.	
Objective 1: Create (number) of green spaces that are connected to each other as well as natural habitats via greenways by (date.)	
2.1.1	Identify greenways and create a greenway plan - map out potential connections between open space areas and other public prope
2.1.2	With ecology specialists, prepare a citywide assessment and map of essential habitat connections using best available science, ecol
2.1.3	Prepare an open space plan to increase residential connections to green space.
Goal 3: Ensure that adequate green space and recreational facilities exist to meet need.	
Objective 1: Ensure that recreation facilities and open space continually meet needs of population growth.	
3.1.1	The City's Adequate Public Facilities Ordinance (APFO) should be revised to include parks as a public facility.
3.1.2	If parcels appropriate for use as recreational facilities or open space are identified through the planning process, the City should pur
Objective 2 : (Percentage) of residents have access to parkland or natural space within a 10-minute walk by (year).	
3.2.1	Require that all new developments of a certain size include green space that will be open to the public or preserved in its natural sta
3.2.2	Seek input from various user groups and community populations on their recreation needs, as well as continue to conduct observat
3.2.3	Create an inclusive organizational system that empowers citizens to be stewards of public spaces.
3.2.4	The City should develop spaces identified for recreation with courts, fields, and playgrounds, as appropriate for the community.
3.2.5	Conduct observational studies of recreational facility use.
3.2.6	Conduct an inventory and assessment of potential outdoor recreation spaces.
3.2.7	Develop a plan with recommendations for increasing the quantity, quality, and use of recreation spaces.
3.2.8	Supplement the existing open space plan, with special emphasis on increasing connections between residential areas and open spa

	TIMEFRAME	LEAD AGENCY
rivate property owners in planting more trees.	Short-term	(INSERT APPROPRIATE AGENCY)
	Short-term	(INSERT APPROPRIATE AGENCY)
	Mid-term	(INSERT APPROPRIATE AGENCY)
does not apply to the City.	Short-term	(INSERT APPROPRIATE AGENCY)
	Short-term	(INSERT APPROPRIATE AGENCY)
l and City plantings.	Short-term	(INSERT APPROPRIATE AGENCY)
	Short-term	(INSERT APPROPRIATE AGENCY)
e City as at risk bird habitats.	Short-term	(INSERT APPROPRIATE AGENCY)
rties.	Mid-term	(INSERT APPROPRIATE AGENCY)
ogical data, and spatial analyses.	Mid-term	(INSERT APPROPRIATE AGENCY)
	Mid-term	(INSERT APPROPRIATE AGENCY)
	Short-term	(INSERT APPROPRIATE AGENCY)
rchase those properties or pursue a conservation easement	Ongoing	(INSERT APPROPRIATE AGENCY)
ate.	Mid-term	(INSERT APPROPRIATE AGENCY)
ional studies of recreational facility use.	Ongoing	(INSERT APPROPRIATE AGENCY)
	Short-term	(INSERT APPROPRIATE AGENCY)
	Ongoing	(INSERT APPROPRIATE AGENCY)
	Short-term	(INSERT APPROPRIATE AGENCY)
	Short-term	(INSERT APPROPRIATE AGENCY)
	Mid-term	(INSERT APPROPRIATE AGENCY)
ace.	Mid-term	(INSERT APPROPRIATE AGENCY)

GOALS, OBJECTIVES AND ACTIONS SUMMARY TABLE

Goal 4: Ensure that trees and urban space remain healthy and well-maintained.	
Objective 1: Ensure 100% of existing urban canopy remains intact, with an average street tree lifetime of at least 20 years.	
4.1.1	Include a line item for tree maintenance in its budget.
4.1.2	Create a "Treekeepers" program to empower residents to care for the trees in their neighborhood.
4.1.3	Implement sustainable landscape maintenance practices.
4.1.4	Partner with local nurseries to implement this objective.
Objective 2 : Maintain existing park and recreation levels of service without an increase in cost.	
4.2.1	Establish a summer youth employment program.
4.2.2	Invest in purchasing or renting a municipal goat herd for grazing and maintenance of areas and use vinegar instead of pesticides to

	Ongoing	(INSERT APPROPRIATE AGENCY)
	Short-term	(INSERT APPROPRIATE AGENCY)
	Short-term	(INSERT APPROPRIATE AGENCY)
	Short-term	(INSERT APPROPRIATE AGENCY)
	Mid-term	(INSERT APPROPRIATE AGENCY)
maintain municipally owned grass areas throughout Frederick.	Short-term	(INSERT APPROPRIATE AGENCY)

5 | Waste & Recycling

Goals: Introduction

1. Reduce the volume of waste generated and sent to county landfills.

The amount of waste generated by a city is one visible indicator of its sustainability. Many communities throughout the nation are moving toward a net-zero waste goal, which means increased recycling and composting and reduced trash that is landfilled or incinerated. In Frederick, none of the city-generated trash, recyclables, or compostables are processed or stored within the city. Trash is landfilled in or transferred out of the County, yard waste is stored and composted in Frederick County, and recyclables are processed at a Frederick County facility.

Approximately 1,450 to 1,600 tons of trash are collected from city residents and businesses each month. Each year, the City spends nearly $1.5 million in tipping fees to Frederick County to landfill that waste or transfer it out of the County. The City permits up to 180 gallons of trash per household and up to 320 gallons of trash per business each week.

Recycling is not mandated in the city, but approximately 91 percent of residents have a recycling cart. Despite the high number of carts, only 51 percent of them are set out for pick-up. Fewer than 300 tons of recyclables are collected each month in the city, a total annual tonnage of 3,578, or about 16 percent of the city's overall waste.

The City already is exploring the potential for processing compost from restaurants at its wastewater treatment plant, but some households could compost kitchen waste in home gardens now. Ongoing compost education will be needed to help residents understand the benefits of home compost and to address some common misconceptions, such as foul odors and attracting animals.

The primary immediate goal for the City should be to establish a waste baseline and goals for a holistic reduction of trash, increase in recycling, and in-city compost processing. The key to successfully reducing waste will be progressively increasing goals for waste, recycling, and composting.

Reduction of trash, increased recycling, and the addition of composting will lead to fewer City funds spent on tipping fees and reduced strain on the landfill. The City will be challenged with changing the way residents think of trash, recyclables, and compostables over the next few years.

1 Goal: Reduce the volume of waste generated and sent to county landfills.

Why?

ECONOMY

The County manages the landfill and the City is charged a tipping fee by the waste processing facility. The tipping fee for trash is $69 per ton. The cost of recycling is $25 per ton. If just 10 percent of the 18,404 tons of the city's trash were recycled, the City could save about $81,000 annually in tipping fees. The City accepts yard waste to be composted at a Frederick County facility. However, household kitchen compost has not been addressed. If just 10 percent of the city's trash were diverted for home compost use, the City could save about $127,000 annually in tipping fees.

ENVIRONMENT

Any reduction of waste in landfills reduces greenhouse gas emissions and potential hazardous materials seeping into groundwater or into the Chesapeake Bay.

EQUITY

Poorer residents or those on the fringes – nationwide – often suffer from poor conditions due to improper land use or brownfields as they are located on cheaper land. By reducing the amount of land required for landfills, there is less chance of those residents in lower socio-economic status coming in contact with unfit residential lands.

Potential Challenges with Goal 1:

There are no current policies related to recycling or composting.

Upfront costs.

Recycling collection is run by the county; there might be pushback from the City about taking on this responsibility.

NACs vary in resources and capacity, so it may be difficult to gain acceptance and cooperation across NACs Since the County has jurisdiction over the public school system and the recycling program, it might be difficult to promote or implement any recycling education initiatives at the school-level.

Objective 1:

Achieve a total waste diversion rate of 50 percent by (year) reusing materials through recycling, home composting, and conversion to capture their economic value.

Establishing a goal to increase recycling and composting will help the City work toward reducing waste going to the landfill and ultimately reducing tipping fees. This goal will be a good start for the City and will likely be increased over time as we learn more about the potential for recycling and composting.

Actions:

1. Adopt a recycling and composting goal.

   Ongoing **Agency**: *(INSERT APPROPRIATE AGENCY)*

   See Appendix F for Takoma Park Food Waste Collection Program Case Study (Food Waste Collection n.d.)

Objective 2:

Establish sustainability policies and programs at the city level by (year).

Actions:

1. Establish a public school recycling program

   Ongoing **Agency**: *(INSERT APPROPRIATE AGENCY)*

Successes to Date:

1. The City has begun gathering trash data at the NAC level to assess the NACs' recycling and composting potential. The City has also partnered with Hood College's ENACTUS, a business research group, to develop their findings into a marketing strategy that targets specific NACs with recycling and composting potential (Kershner and Willoughby 2015)

2. Janece Jackson, during her senior year at Hood College, was recognized for her For Goodness Sake program that transports leftover food to local shelters from nearby grocery stores, restaurants, and Hood's dining hall (Gardner 2001).

ECONOMIC DEVELOPMENT ANALYSIS

The following pages are in-depth analyses of each goal and objective - detailing case studies, best practices, and implementation methods. It is meant to be supplementary material that can guide Frederick.

GOAL ONE | OBJECTIVE ONE - TWO:

1) Achieve a total waste diversion rate of 50 percent by (year) reusing materials through recycling, composting, and conversion to capture their economic value.

CASE STUDY CITIES:

Washington, DC

University of South Carolina

GOAL ONE:

Reduce the volume of waste generated and sent to county landfills.

O-1:
Explore a pay-as-you-throw system for trash in conjunction with enhanced recycling for all residents and businesses. A pay-as-you-throw system is more equitable as residents pay for each bag they put at the curb for pickup. Coupling this with an enhanced recycling program and eventually incorporating a composting program will be a more holistic solution to the city's waste. This system will immediately reduce waste and increase recycling, but can only work if all components are in place.

Consistent yearly evaluations will be needed to determine progress. The City may also choose to explore other avenues of waste reduction similar to neighboring jurisdictions, such as fees for each disposable plastic or paper carryout bag and a ban on plastic-foam food and drink containers if it is determined that these items make up a significant portion of the waste stream.

Provide recycling and composting containers in parks. Recycling containers should be paired with trash receptacles in parks and on some streets. The City should lead by example wherever possible and parks and streets present an excellent educational opportunity to do so.

Decreasing the total waste volume by removing recyclables and organic waste from the general waste stream will result in a lower landfill volume, resulting in lower tipping fees. By partnering with the Department of Economic Development, the City can determine how a boost in recycling can be done in a way that increases employment for city residents. See the Economic Development Chapter for more about expanding the Waste Management and Recycling job sector.

Case Study:
DC's 2011 Sustainability Plan proposes a "Pay-As-You-Throw" program, citing Fort Collins, CO as an example for successfully encouraging residents to embrace recycling and other waste diversion techniques (Sustainable DC Plan 2011).

Create an adopt-a-street, trail, creek, stream, and/or river program to pick up trash along these corridors. Volunteer efforts would be organized for these activities and appropriate signage for the corridors would be put in place. Volunteers could be organizations, businesses, or individuals. Some organizations sponsor yearly cleanup events, such as Downtown Frederick Partnership's Bring a Broom Saturday and the Common Market's annual Watershed Cleanup. (Explore educational opportunities to increase recycling among residents who could recycle more and those who do not recycle at all.)

Study the percentage of recyclables, organics, and reusables in the city's trash stream to help set goals for each. Knowing what gets thrown away will help the City set effective goals for recycling, composting, and trash.

Explore and implement paperless strategies where appropriate throughout internal City operations. Many applications for permits and planning as well as some informational notices could be posted on the City's website and residents could submit applications online as well. Paycheck notices, benefit announcements, timesheets, and other printed material should be evaluated for potential secured online access by employees.

O-2:
Work with the County to create a "There is No Away" campaign, to monitor waste disposal in government buildings and public schools. Show where different trash ends up and challenge residents to reduce waste and repurpose trash. Use this platform to better educate the public

about sanitation services through school programs and City employee training.

Case Study:
"There's no away" recycling campaigns have become popular at universities across the country. University of South Carolina's recycling coordinator, Larry Cook, considers waste an untapped resource that is filling up our landfills. University of Maryland shares this mentality, pairing trash bins with recycling and composting bins all over campus that show users how to properly separate and dispose of their "trash" (McCarthy 2015)

Work with the County to establish a public school recycling program. Educational programs at the Elementary school-level can be instrumental in promoting waste reduction. The hands on experience of participating in the collection process, learning to separate waste at the end of lunch, and seeing how food scraps can be composted into fertilizer allows children to act as agents of change in their communities, taking ownership and encouraging their parents to do so at home.

Case Study:
Check out this Guide for Implementing a School Recycling Program "A school recycling program is a hands-on, interdisciplinary lesson that educates students about the environment, personal responsibility, community action, and solid waste management. School recycling programs not only impact students and their families but also impact communities and the overall waste diversion in a community" (A Guide for Implementing a School Recycling Program n.d.).

GOALS, OBJECTIVES AND ACTIONS SUMMARY TABLE

Goal 1: Reduce the volume of waste generated and sent to county landfills
Objective 1: Achieve a total waste diversion rate of 50% by (year) reusing materials through recycling, home composting, and conversion to capture their econor
1.1.1 Adopt a recycling and composting goal.
Objective 2 : Achieve a total waste diversion rate of 50% by (year) reusing materials through recycling, home composting, and conversion to capture their econo
1.2.1 Establish a public school recycling program.

mic value.	TIMEFRAME	LEAD AGENCY
	Ongoing	(INSERT APPROPRIATE AGENCY)
mic value.		
	Ongoing	(INSERT APPROPRIATE AGENCY)

6 | Economic Development

Introduction

Goals:

1. Expand training opportunities for city residents without a college degree.
2. Expand hiring opportunities on City projects for city residents.
3. Increase wages for low-income city residents.

"The City of Frederick is the hub of government, culture and commerce in Frederick County. A significant percentage of Frederick residents are well-educated and highly skilled, and more than half of the City's workers are employed within Frederick County. Frederick's strong economy is due to several factors, including the diversity of industry sectors and the impact of Fort Detrick. Frederick's business base includes bioscience, advanced technology, manufacturing, healthcare, financial services, and tourism. [However] residents expressed the need for increased job opportunities in Frederick, in order to provide increased options to those residents who currently commute to jobs outside of the County. In response, the City of Frederick has implemented a variety of land use and economic development strategies and programs to make Frederick a preferred employment location. The City's Department of Economic Development strives to increase economic opportunity in the City of Frederick through job creation, revitalization and reinvestment. The Department's initiatives reflect the crucial role of economic development in enhancing Frederick's quality of life." (Comprehensive Plan 2010)

Local government is a major driver of a local economy. The City of Frederick influences the local economy through the services it provides businesses and residents and through the capital projects it funds. Taxpayer money that funds these services and projects can be guided in a way that continues to benefit local residents. This chapter highlights ways in which the City can guide its influence on jobs and wages in a way that contributes to a more sustainable, equitable economy.

Successes to Date:

1. The 2010 Comprehensive Plan Policies contain multiple sustainability principles that promote economic development, including: Promoting a diverse industry mix for economic resiliency; and Encouraging revitalization and reinvestment in traditional business corridors (Golden Mile and East Frederick). (Comprehensive Plan 2010)
2. The City has succeeded in coordinating with the County and among economic development, transportation and infrastructure departments in a way that promotes development. (Comprehensive Plan 2010)
3. The City has effectively promoted itself as a biotech hub through Tech Transfer with Fort Detrick, National Cancer Center and local colleges. Small companies have branched off of research institutes to create commercial products.
4. The City strives to boost manufacturing industry, where there have been recent losses, by phasing out business personal property tax by 2025, when businesses will no longer have to pay city taxes for personal property. (Fifield 2015) Customized Training Programs: The City partners with Frederick Community College (FCC) and Hood College to implement training programs that cater to current industry demands, entice businesses to locate in the city, and enhance job opportunities for local residents.

1 Goal: Expand training opportunities for city residents without a college degree.

Why?

ECONOMY

A workforce that is well-skilled is attractive to business.

ENVIRONMENT

Training programs could focus on green technologies, such as those in the waste/recycling sector, improving the ability of Frederick to follow through on many of the environmentally-focused recommendations of this report.

EQUITY

A community grows sustainably when all of its residents prosper without a segment left behind to struggle. While overall the City of Frederick is economically healthy and well-educated with a diverse set of industries, there are NACs within the city with high rates of unemployment and poverty and low levels of educational attainment.

Objective 1:

Expand the number of city residents to (percent) who are enrolled in training programs that are closely connected to a career path and engage more workforce representatives on training programs by (year).

Actions:

1. Open seats for workforce representatives on the Frederick County Workforce Development Board.

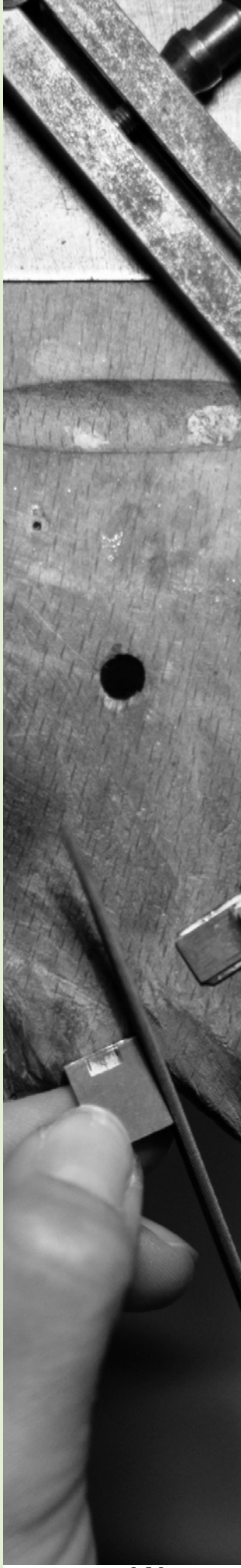
   Immediate — ***Agency**: (INSERT APPROPRIATE AGENCY)*

2. Establish a City-coordinated program that creates career pathways for disadvantaged City residents, connecting them directly to living wage jobs, and meet the training needs of a set of employers in a particular sector.

   Mid-term — ***Agency**: (INSERT APPROPRIATE AGENCY)*

3. Assess the training needs of the biomed and IT sectors to pursue training programs linking disadvantaged City residents to career paths in those field.

   Ongoing — ***Agency**: (INSERT APPROPRIATE AGENCY)*



2 Goal: Expand hiring opportunities on City projects for city residents.

Why?

ECONOMY

City spending targeted at local jobs keeps dollars circulating in the local community.

ENVIRONMENT

One of the industries we recommend targeting for expansion of employment and training opportunities is Waste and Recycling. If the City is able to find ways to expand recycling and composting, deploying the latest technologies, it would reduce the City's use of the County's landfill, potentially contribute a renewable energy source to the City's wastewater treatment plant, while also expand job opportunities for local residents.

EQUITY

There continue to be pockets of high unemployment in several NACs. Targeting city residents for new jobs will ensure that significant segments of the population are not struggling economically.

Potential Challenges with Goal 2:

Recruiting residents who are ready and able to work, particularly those with limited educational attainment.

Expanding employment for struggling city residents could have implications that challenge environmental goals. If unemployment drops in particular NACs that currently have high rates, that will likely lead to temporary congestion and air pollution as more residents need to commute to work. Additionally, more employed residents could afford to own vehicles and could increase driving.

Objective 1:

Expand hiring opportunities for (percent) of city residents that are struggling with low wages and under-or unemployment by (year).

Actions:

1. Adopt procurement policies that promote local hiring.

Ongoing

***Agency**: (INSERT APPROPRIATE AGENCY)*

3 Goal: Increase wages for low-income city residents.

Why?

ECONOMY

Because lower income people spend a greater percentage of their budget, wage increases to that population measurably boost consumer spending and the local economy. For example, research demonstrates that increases to minimum wage rates generally result in aggregate gains to consumer spending and GDP, despite any resulting price increases. (Aaronson and French 2013) With more money in their pockets, residents of Frederick will improve the local economy.

EQUITY

There is a significant population of low-income residents in the city. Nearly one quarter of households in the city earn less than $35,000 per year, half of the living wage required for two working parents to support two children. (American Community Survey, 2011-13, Income in the Past 12 Months, City of Frederick n.d.) Improving minimum wages in the city would ensure more equitable growth.

Potential Challenges with Goal 3:

Ensuring that contractors abide by the proposed living wage ordinance could prove challenging. The Office of Purchasing may need to tap enforcement support from the City's Legal Department or the Maryland Department of Labor, Licensing and Regulation. Outreach by workforce representatives to workforce educating them about the law could also help with enforcement.

Objective 1:

Establish a living wage for (percentage) of city residents by (year).

Ensure that City spending results in jobs that pay a living wage by 2017.

Actions:

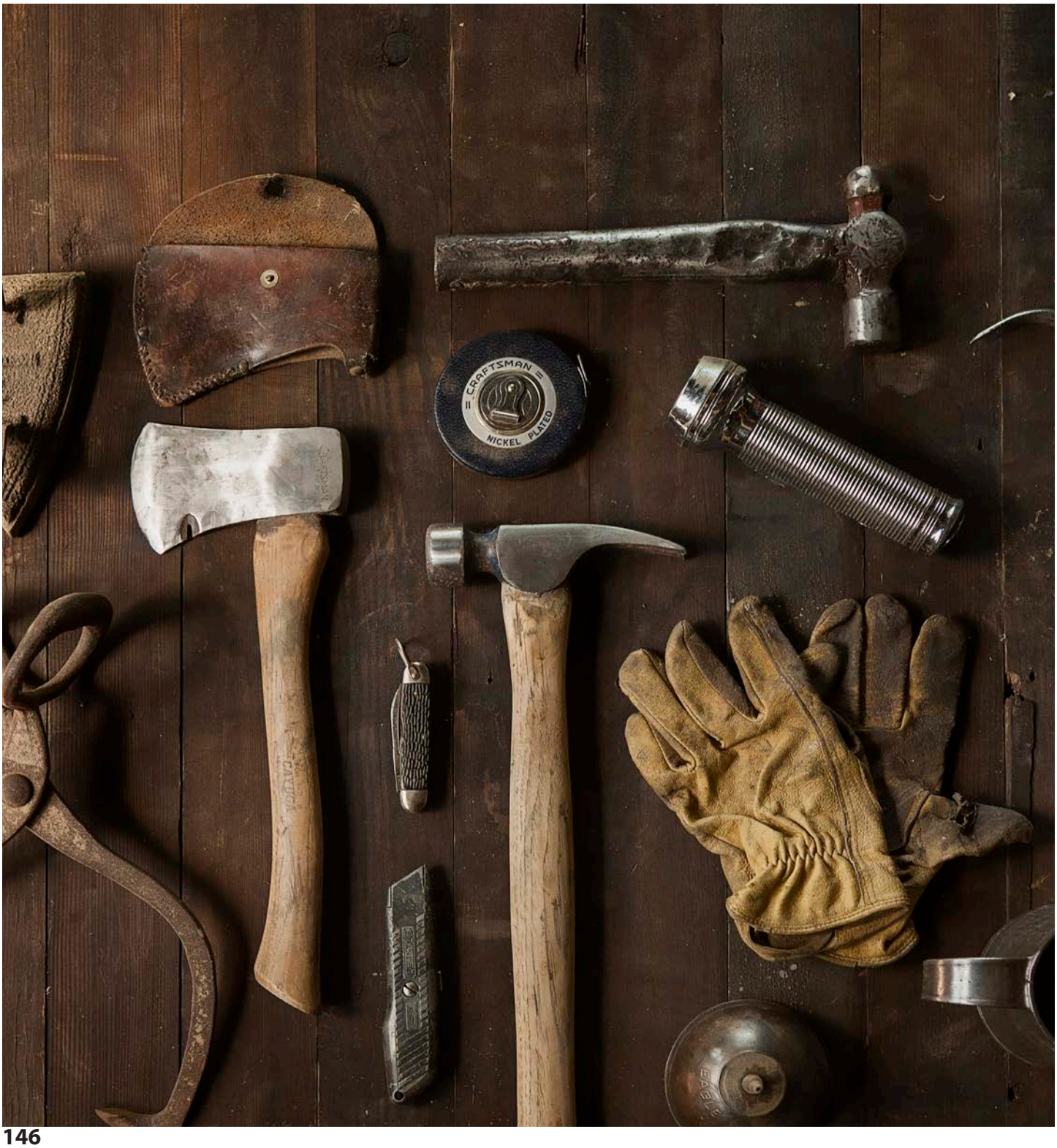
1 Adopt a living wage ordinance.

Short-term

***Agency**: (INSERT APPROPRIATE AGENCY)*

ECONOMIC DEVELOPMENT ANALYSIS

The following pages are in-depth analyses of each goal and objective - detailing case studies, best practices, and implementation methods. It is meant to be supplementary material that can guide Frederick.



GOAL ONE | OBJECTIVE ONE:

1) Expand the number of city residents to (percent) who are enrolled in training programs that are closely connected to a career path and engage more workforce representatives on training programs by (year).

CASE STUDY CITY:

Tacoma, Washington

Regulations The Frederick County Workforce Development Board should include workforce representatives. Currently, the Board only includes representatives from the City of Frederick, businesses and staffing agencies. (Workforce Development Board n.d.) Not only would it improve the effectiveness of the training initiatives to include labor and community perspectives, but it would place the Board in compliance with federal regulations regarding local workforce development boards, which are to include a minimum of 20 percent of the members of the Board are to be workforce representatives (including labor organizations and joint apprenticeship program representatives). (Training and Employment Guidance Letter WIOA No. 27-14, Employment and Training Administration 2015)

As the NAC analysis in this report demonstrates, the struggling neighborhoods in Frederick are also those with lower levels of educational attainment. Affordable and accessible training programs that are linked to good jobs offer residents with a high school degree or less the opportunity to climb the economic ladder. The Economic Development Department, according to Director Richard Griffin, recognizes the need for residents to access more training opportunities with pipelines to good jobs. To expand training opportunities, the City:

1) Identifies some the training needs of the City's employers;

2) Partners with Frederick Community College and Hood College to develop training programs that respond to those needs; and

3) Works with community groups like AACF, Centro, and East Frederick Rising to identify residents

We recommend that the Economic Development Department expand this critical area of work by creating a new City-run program that both develops new training programs and coordinates existing programs to ensure that disadvantaged city residents have expanded opportunities to career pathways. The program would broaden the focus of training from specific employers to more industry-wide needs. It would also include accountability mechanisms to ensure that training partners within the program were successful in both recruiting high-need city residents as well as placing them in living wage jobs. Partners could include Hood College, Frederick Community College, community-based organizations, joint apprenticeship programs, and local employers. Additionally, the program could work with the Office of Purchasing to develop incentives for City contractors to hire through the training program.

Case Study: One potential model for this program is the LEAP program run by the City of Takoma, Washington. The program is focused on providing career pathways into the construction sector for disadvantaged city residents living within targeted renewal/empowerment zones. The program focuses on strengthening the network of training providers to increase opportunities for residents to join apprenticeship programs, where they earn money while they learn a skilled trade. LEAP has had measurable success getting residents

GOAL ONE:

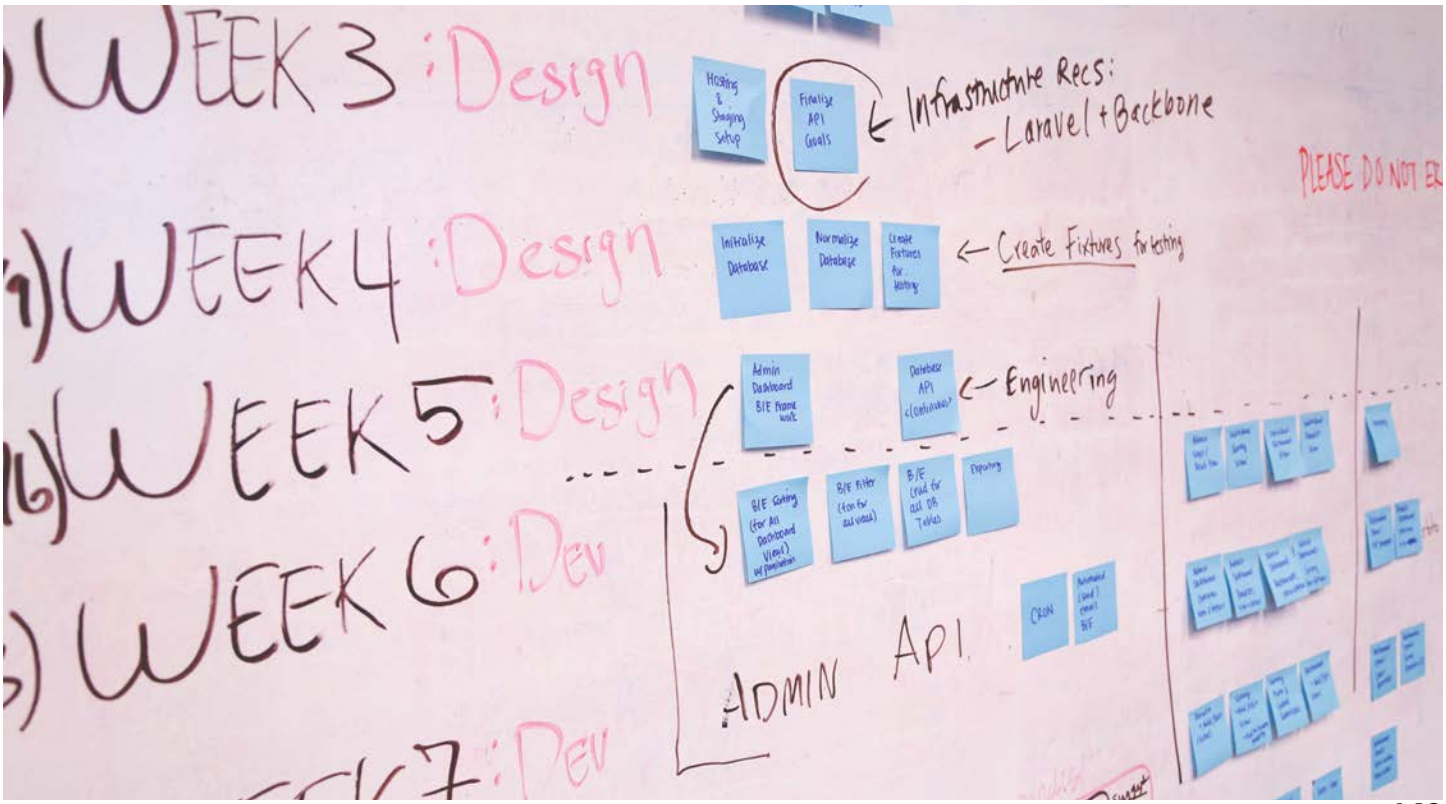
Expand training opportunities for city residents without a college degree.

into apprenticeship positions working on City-funded projects. (Guzman n.d.)

Under the 2014 federal Workforce Innovation and Opportunity Act, there are greater incentives to connect training to family wage jobs and target disadvantaged populations. (Bird, Foster and Ganzglass 2014) This poses an opportunity to secure federal funds from this Act for both the development and potential implementation of a new program.

For the City's focus on training to both take advantage of the training needs of a key sector and to meet equity goals, we recommend that the Workforce Development Board of Frederick County and the Economic Development assess the training needs of employers in the biotech/biomed and IT sectors and explore vocational training programs for the that could lead to careers in these higher paying sectors for city residents without a college degree. Given the recent amendments to federal workforce policies, which focus more heavily on increasing ties between training and good jobs, the Board could potentially access more federal funding for training connected to careers in the biotech/biomed and IT sectors. And similar to the targeted hiring options available in the Purchasing process, the Board could incentivize training programs that target disadvantaged local residents and result in secure, family-supporting jobs.

As Appendix D.1 reveals, the jobs in Frederick are spread out across a number of different industries, the most frequent being healthcare, education, retail, finance and public administration. Science and technology is significant at over 9 percent, with the city being one of the country's largest biotech hubs. The presence of major research centers Fort Detrick and the National Cancer Center has spurred the creation of smaller companies. (Griffin 2015) Despite the major presence of this sector and the City's work to encourage its growth, the customized training programs that they've developed with partners have focused on other industries such as health care (nursing) and skilled manufacturing (welding). The U.S. Department of Labor Workforce Innovation Fund grants is a potential funding source for this program.



GOAL TWO | OBJECTIVE ONE:

1) Expand hiring opportunities for (percent) of City residents that are struggling with low wages and under-or unemployment by (year).

BENCHMARKS:

By 2016: Establish the City policy and begin the First Source Hiring registry.

By 2017: 30 percent First Source employees and 45 percent total City residents.

By 2018: 40 percent First Source employees and 51 percent total City residents.

GOAL TWO:

Expand hiring opportunities on City projects for city residents.

Between August 2011 and July 2015, the City issued nearly 100 bids through the procurement process. (City of Frederick Solicitation Opportunities 2015) The bids cover a wide range of jobs and cover purchases of various goods. Looking ahead to fiscal years 2015-2020, the City of Frederick projects spending over $391 million on capital improvement projects, with 73 percent of that funding approved so far. (Capital Improvements Program, FY 2015-2020 2015) As Appendix D.2 indicates, this spending covers improvements for a range of projects, including improvements for the water and sewer system, parks, and the municipal airport.

While the funding these projects comes from a variety of debt, fees and general revenue sources, the City ultimately controls how this significant amount money is spent. Thus the procurement process for choosing contractors and purchasing goods that advance these capital projects offers the City the opportunity to shape who obtains work from these projects, and whether or not they are City residents, and/or whether they reside in one of the economically struggling NACs. It has been the City's policy since 2001 to give preference to local businesses, where 10 percent of the bid cost is deducted for a business located in the city in 5 percent of the bid deducted for a business located in the State. (Alderman 2001) One option is for the City to extend this policy to cover employees who work on City-funded projects ensuring the economic benefits of these projects stay within the community.

Targeting certain populations for employment through the procurement process can be accomplished through various policies and procedures. The City could encourage or mandate the use of a "First Source Hiring" process in projects it funds. Prince George's County has a First Source and Local Hiring ordinance that mandates that businesses entering into procurement contracts with the County utilize the First Source registry for hiring of all jobs created by the project, and to fill vacancies during the project. (Jones 2011) The County maintains this registry, which includes the names of veterans, unemployed, low-to-moderate income (those within 300 percent of federal poverty guidelines), and other County residents seeking jobs.

By creating and managing a First Source registry, the City can utilize a number of criteria for accepting job applicants to the list and prioritizing them. These criteria could include income, veteran status, and whether residents live in targeted neighborhoods. In addition to project-specific jobs, the City can implement First Source hiring requirements for concessionaires that operate on City-owned land and/or with City funding. An ordinance can require that contractors use the registry to hire for new jobs for a specific period of time, such as 30 days, before they can hire outside of the registry. Contractors can also be required to maintain a minimum percentage of registry hires on the job. Given the administrative requirements of tracking and enforcing such an ordinance, the City could mandate it for projects of over a specific dollar figure, while encouraging it for smaller projects. The ordinance should set aside funding from the General Fund to create and maintain the First Source Hiring registry

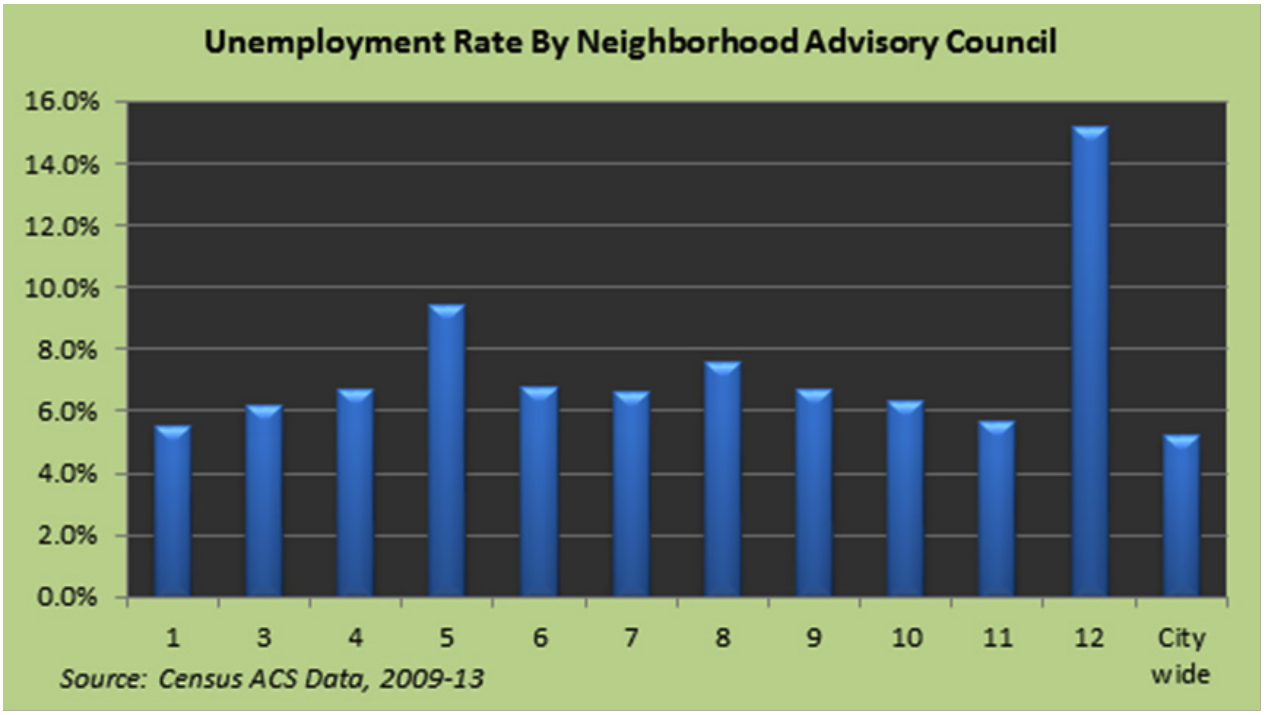
The Frederick County Chamber of Commerce maintains a listing of its member businesses, grouping them by detailed industries. (Frederick County Business Directory n.d.) Data was pulled for a set of private industries where wage levels tend not to be clustered in the lowest quartile (such as in the retail and food/enter-

tainment sectors), according to Census data for the City. (American Community Survey, 2011-13, Occupation by Median Earnings in Past 12 Months, City of Frederick n.d.) As evident in Appendix D.3, Waste Management and Recycling is not an insignificant sector of the economy, including nearly four percent of the City's jobs with seven local firms operating in the County.

The Department of Public Works could partner with the Department of Economic Development to determine how the City's initiative to boost recycling and composting can be done in a way that increases employment for city residents. Currently, the City manages waste removal and the County manages recycling. According to an interview with Department of Public Works Director Zach Kershner and Sustainability Planner Jenny Willoughby, the City is aiming to reduce the waste it removes and sends to the County landfill in order to both reduce landfill fees as well as to meet its renewable energy goals. Currently, the City is undergoing research on this topic. It's gathering data from NACs to determine the potential for pulling recycling and composting from waste, and partnering with Hood College in order to determine a marketing strategy for the potential program. They are also exploring how compost could be used as a source of renewable energy to power the City's wastewater treatment plant.

While the City is exploring an expansion of recycling and a composting initiative, there has not yet been a focus on how such an initiative can expand employment in addition to accomplishing environmental and fiscal goals. An expansion of jobs in this sector, given that it's part of the City process, could be covered by the proposed First Source Hiring process to ensure local hiring, and covered by the proposed living wage ordinance to guarantee wages are family supporting.

The new initiatives they are studying may require new technologies, and thus workers with a higher skill set. The Public Works and Economic Development Departments could study the jobs potential for this initiative, exploring whether the City should expand its partnerships with its local colleges to include training programs for recycling and composting employees. (Kershner and Willoughby 2015). Research on recycling already underway by Departments of Planning and Public Works, while Hood College is already looking into marketing. This proposal is to expand the current inquiry to cover jobs and training, which should not involve significant new resources.



GOALS, OBJECTIVES AND ACTIONS SUMMARY TABLE

Goal 1: Expand training opportunities for City residents without a college degree
Objective 1: Expand the number of City residents to (percent) who are enrolled in training programs that are closely connected to a career path and engage mor
1.1.1 Open seats for workforce representatives on the Frederick County Workforce Development Board.
1.1.2 Establish a City-coordinated program that creates career pathways for disadvantaged City residents.
1.1.3 Assess the training needs of the biomed and IT sectors to pursue training programs linking disadvantaged City residents to career pa
Goal 2: Expand hiring opportunities on City projects for City residents.
Objective 1: Expand hiring opportunities for (percent) of City residents that are struggling with low wages and under-or unemployment by (year)
2.1.1 Adopt procurement policies that promote local hiring.
Goal 3: Increase wages for low-income city residents.
Objective 1: Establish a living wage for (percentage) of city residents by (year).
3.1.1 Adopt a living wage ordinance.

e workforce representatives on training programs by (year).	TIMEFRAME	LEAD AGENCY
	Immediate	(INSERT APPROPRIATE AGENCY)
	Mid-term	(INSERT APPROPRIATE AGENCY)
ths in those field.	Ongoing	(INSERT APPROPRIATE AGENCY)
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	Short-term	(INSERT APPROPRIATE AGENCY)
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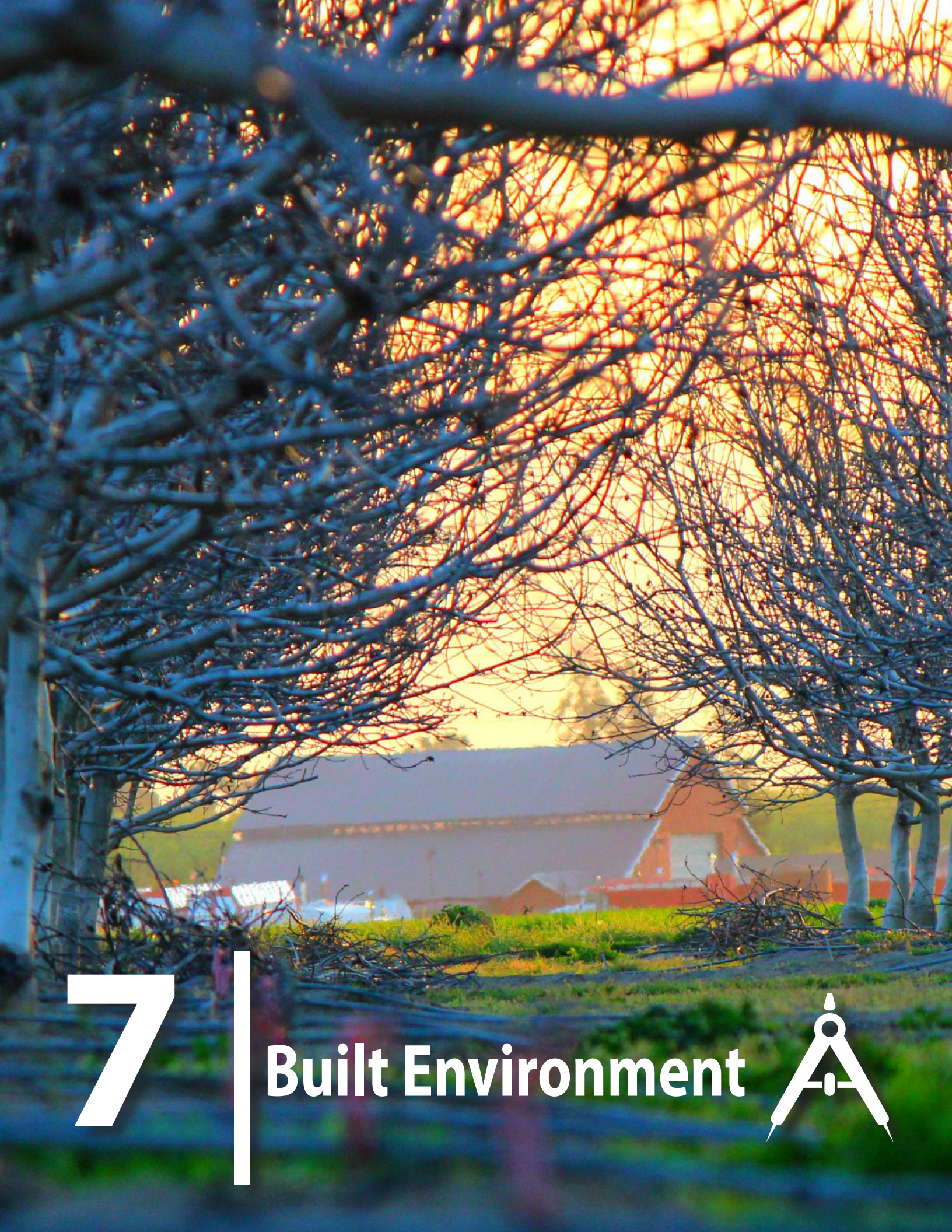


7 | Built Environment

Introduction

Goals:

1. Integrate sustainability and transportation with land-use planning decisions.
2. Design healthy, equitable, walkable communities.
3. Encourage mixed-use infill and repurposed development within the City of Frederick.

The objective of this chapter is to set forth guiding principles to ensure sustainability is taken into account when making land use decisions. One of the City of Frederick's foremost challenges is accommodating growth while retaining and enhancing the quality of life for residents and businesses, as well as addressing the ecological needs of the region. Already the City has successfully incorporated several sustainable practices in land use planning and development; its comprehensive plan and Land Management Code includes several elements that promote sustainable practices for the City, including a Land Use Map that helps define a future direction for the city. Additionally, the City's tax credit program has effectively encouraged property owners to reinvest in the city instead of pursuing greenfield development. The Union Mills Building is one such success story, where the City gave tax credits to the property owner, Douglas Development Corp, to rehabilitate a downtown building. The company hired a local construction company that just completed an extensive renovation. Regent Education, a growing IT company, is relocating to the building from its downtown office to accommodate an expanded staff.

Successes to Date:

1. The City recently adopted a Healthy Eating Active Living (HEAL) Cities Campaign, which recognizes the role of design on public health and supports policies that encourages walkability, bikeability, safety transit oriented and mixed use development.
2. The Frederick Town Historic District already supports a vibrant mix of land uses, with blocks and buildings that are appropriately scaled for accessibility to both pedestrians and vehicular traffic.
3. The City is taking steps to enhance this district through construction along Carroll Creek Linear Park, and is
4. Improving its walking and biking connectivity by working to connect the Water Park to Baker Park and Downtown through the Shared Use Path.

1 Goal: Integrate sustainability and transportation with land-use planning decisions.

Why?

ECONOMY

Communities that plan for a positive daily human experience by providing meaningful connections between residents, amenities and employment, attract and retain residents and new economy employers. Connecting land-use and transportation planning allows cities to grow while minimizing increased infrastructure costs and can potentially reduce heavy automobile traffic at the same time.

ENVIRONMENT

Creating an integrated vision for the city which can help guide land use decisions towards sustainable principles as Frederick grows will have broad impacts on energy consumption, air quality, water quality, health, and natural ecosystems. By identifying environmental resources and agricultural lands to protect and restore, the city can move towards greater long term resiliency.

EQUITY

The ability of residents to travel to services and jobs in Frederick is not just critical the city's economic and environmental vitality, it enhances equity when it is used to connect people of every income level to jobs and opportunity and connects people from all neighborhoods to healthy and enjoyable environments and amenities.

Potential Challenges with Goal 1:

As addressed in the Plan's Land Use Element and the Community Character and Design Element, the ability to control the character of development is critical to retaining and reinforcing the distinctive quality of Frederick's neighborhoods. The Plan's recommendations on growth management are designed to support the short and long-term livability and attractiveness of Frederick's residential areas and the ability of employment areas to attract and retain development. (History of land use in Frederick's comprehensive plan, page 9)

Frederick struggles with a lack of integration of the transportation infrastructure into the community fabric. The planning and development of transportation improvements have not always considered quality-of-life impacts, including accessibility for local residents. Because of this history, it will take a long term ongoing effort to reshape attitudes and existing infrastructure.

Objective 1:

Implement a Future Land-Use Map identifying sustainability goals and coordinating transit plans with proposed development by (year).

Transportation and land use planning are so interwoven however they are commonly housed in different government departments with little conversation about their efforts. Frederick struggles with a lack of integration of the transportation infrastructure into the community fabric, which is most evident in the built environment, where transportation and land use intersect.

Actions:

1. Update the Frederick City Future Land Use Map to better represent a sustainable, transportation connected vision of the City of Frederick to utilize as a guide for future zoning, spending and development decisions.

   Mid-term — ***Agency**: (INSERT APPROPRIATE AGENCY)*

2. Require Small Area plans as they are developed city-wide to coordinate with the guidelines provided by the sustainability plan, the Future Land Use Map, transportation plans.

   Ongoing — ***Agency**: (INSERT APPROPRIATE AGENCY)*

3. Identify neighborhoods needing improved access to meaningful open space, and identify agricultural lands, open space, riparian buffers and floodplains that should be preserved, restored, or designed for eco-friendly recreational use.

   Short-term — ***Agency**: (INSERT APPROPRIATE AGENCY)*

   Green Initiatives Team should work with the Planning Department

4. Identify areas best suited to higher density, Transit Oriented Development, mixed used zoning, and areas most in need of multimodal connectors.

   Short-term — ***Agency**: (INSERT APPROPRIATE AGENCY)*

   The Planning Department should coordinate with the Transportation Planning Board, the Planning Commission, and the Zoning Board of Appeals.

1 Goal: Integrate sustainability and transportation with land-use planning decisions.

Objective 2:

Concentrate new development along public transportation corridors, ensuring (number) of jobs are located within a quarter mile of a transit stop by (year).

Concentrated development along public transportation corridors increases efficiency, people can walk, bike and take transit, helps minimize the impacts of traffic, and provides a rich mix of accessible housing, jobs, shopping and recreational choices. It provides value for the public and private sectors, and residents and helps create a sense of community and of place.

Actions:

1. Prepare an information sheet on additional ways to enable, incentivize and streamline development that concentrates density near transit stops in harmony with the Future Land Use Map and sustainability plan.

   Mid-term **Agency**: *(INSERT APPROPRIATE AGENCY)*

   Planning should consult with the Building Code Appeals Board, Green Initiatives Team, Planning Board, Zoning Board of Appeals.

Objective 3:

Plan and implement (number) safe multimodal access areas between high density employment centers, amenities, parks and all city neighborhoods, putting in place pedestrian, bike auto and transit connections from every NAC to major city nodes by (year).

Frederick City's shared use path system is a great start on this action. Pairing multimodal transportation infrastructure with local development plans can immediately link destinations to residents. It is important that Frederick extends its multimodal reach to all its neighborhoods, in order to garner economic, environmental and equitable benefits for all its citizens.

Actions:

1. Invest in local and regional multimodal transportation infrastructure planning, design and construction in line with the Future Land Use Map and the sustainability plan.

   Ongoing **Agency**: *(INSERT APPROPRIATE AGENCY)*

Objective 4:

Strengthen public participation in the Land-Use decision making process through scheduling (number) of community volunteerism and neighborhood events by (year).

Frederick City has a great resource in their volunteer boards and committees, but there may be ways to improve the organization and administration of volunteerism and community involvement, so it can continue to be a vital resource for the City of Frederick in the long term.

Actions:

1. Ease permitting requirements for temporary transformations of vacant spaces into vibrant places for arts, community and commercial uses, providing residents with more shopping and entertainment options.

   Short-term **Agency**: *(INSERT APPROPRIATE AGENCY)*

   Planning should consult with Economic Development, Downtown Frederick Partnership, the Zoning Board of Appeals and the Special Events Department.

1. Research potential ways of improving ongoing outreach to citizens of Frederick through long term volunteer committees and boards and community development corporations.

   Mid-term **Agency**: *(INSERT APPROPRIATE AGENCY)*

2 Goal: Design healthy, equitable, walkable communities.

Why?

ECONOMY

Improved walkability attracts new economy workers, entices consumers to purchase more local goods, attracts business relocation, and promotes greater overall economic resilience. Walkable communities reduce commuting and infrastructure costs, attracts tourists and bring in more tax revenue per acre. Walkability is no longer something that is nice to have; it is key to economic competitiveness. Add improved transit and safe biking options and the economic enhancements expand even further.

ENVIRONMENT

The most effective way to reduce CO2 emissions from vehicle emissions is by creating connected, compact, walkable, bikeable built environments that allow people to minimize their vehicle use for day to day activities. A human scaled, people focused built environment allows Frederick City to fight global climate change while enhancing the quality of life of its citizens.

EQUITY

The benefits of walkability: lower rates of obesity, associated chronic diseases and increased happiness have been associated with walkable and bikeable communities. When available, residents take advantage of healthier multimodal options, utilizing safe, pleasant, and proximal routes to employment and needed amenities.

Potential Challenges with Goal 2:

Most cities are facing many barriers to living up to their walkability potential, including dealing with fiscal constraints, acquiring full real estate industry buy-in, gathering political will, addressing community resistance, and measuring real impact.

Much of Frederick outside of the historic core privileges autos above all other uses. Retrofitting and reshaping for greater walkability will take a lot of effort and may experience political pushback from those concerned about change.

Objective 1:

Identify (number) of opportunities to retain and build memorable, iconic places that enhance the character, distinguish the neighborhoods and visual connectivity throughout the City of Frederick by (year).

Tying neighborhoods together with iconic landmarks helps define the unique character of each neighborhood, creates memorable moments, and promotes meaningful spatial references for residents and visitors.

Actions:

1. Identify key locations in Frederick such as view corridors, hilltops, public squares, gateways, centralities, and explore ways best utilize those key locations to create visual markers. Explore the possibility of requiring that significant structures be built on identified key locations.

   Short-term **Agency**: *(INSERT APPROPRIATE AGENCY)*

2. Prioritize preservation, restoration and adaptive reuse of historic structures to fill government needs, and support civic, arts, recreational, parks, commercial or residential uses.identified key locations.

   Long-term **Agency**: *(INSERT APPROPRIATE AGENCY)*

   Planning should consult with Economic Development, Downtown Frederick Partnership, the Zoning Board of Appeals and the Special Events Department.

3. Prepare an information sheet on the mix of amenities in each NAC, noting how many residents are outside of ¼ mile walking distances from amenities.

   Short-term **Agency**: *(INSERT APPROPRIATE AGENCY)*

Objective 2:

Plan for making (percentage) of roadways contain sidewalks on both sides and 100 percent of crosswalks are ADA accessible by (year).

Walkability is the common term, but it should be understood that is meant to be inclusive of those with disabilities.

Actions:

1. Utilize community charrettes and interactive mapping to help identify, inventory, and remediate pedestrian and bike access barriers and put in place needed improvements.

   Mid-term **Agency**: *(INSERT APPROPRIATE AGENCY)*

   Planning should work with the NAC committees

2 Goal: Reduce automobile dependency among city residents.

Objective 3:

Convert (percentage) of Frederick's road network to scale appropriate Complete Street designs by (year).

Complete Streets are designed to enable safe access for all users, including pedestrians, bicyclists, motorists and transit riders of all ages and abilities. Green Streets indicates that the streets are also designed to manage stormwater runoff as a resource. Combined you have streets that are safer, encourage more walking and bicycling, improve water and air quality, and make smart economic sense.

Actions:

1. Develop small area plans to include "Complete Green Streets" interventions at visible Frederick corridors such as W. Patrick Street (Golden Mile), E. Patrick Street (I-70 entrance), Rosemont Ave., and W. Jefferson Street.

   Long-term **Agency**: *(INSERT APPROPRIATE AGENCY)*

   Planning should work with the Mayor, Board of Aldermen, Green Initiatives Team

2. Add illustrations of "Complete Green Street" sections, plans and design details to Frederick City's Land Management Code to help guide the city departments and developers to best practice for future development and redevelopment projects.

   Mid-term **Agency**: *(INSERT APPROPRIATE AGENCY)*

   Planning Department should work with the Green Initiatives Team

3 Goal: Encourage mixed-use infill and repurposed development within the City of Frederick.

Why?

ECONOMY

Infill development would enable the City of Frederick to continue to grow while using existing infrastructure, saving taxpayers the burden of subsidizing new roads, sewer and water lines, and other public services.

ENVIRONMENT

Encouraging mixed use, infill development could encourage more people to both live and work in Frederick, thus reducing auto dependency. According to a recent study, compact development has a measurable impact on reducing vehicle miles traveled (VMT), thus city design is an important means of reducing energy consumption and improving air quality (Ding, et al. 2014).

EQUITY

If Frederick encouraged more businesses to locate downtown, it would mean greater accessibility of these new jobs by public transit, thus lower-income residents that rely upon public transit for their commute would have greater job opportunities.

Potential Challenges with Goal 3:

One of the key challenges identified in the comprehensive plan is that infill development can often be costlier given land value and development costs, thus the residential units built closer to downtown could end up pricing out current low-income residents, running counter to the equity principle of sustainability. To mitigate potential displacement, the City could decide to require that any properties awarded redevelopment tax credits must fall under the County's Moderately Priced Dwelling Unit Ordinance, offering affordable housing to moderate income households.

Objective 1:

The City encourages mixed use, infill development and the repurposing of old structures, with at least (number) such projects breaking ground by (year).

Infill development, when containing mixed uses, encourages people to live and work in closer proximity, thus reducing car dependence. It also accommodates predicted future growth in a way that utilizes fewer

Actions:

1. Expand mixed use zoning within targeted infill development areas

   Mid-term — ***Agency**: (INSERT APPROPRIATE AGENCY)*

2. Streamline and prioritize the approval process for mixed-use, infill development and repurposing of old structures, while de-prioritizing the approval process for development in Tier Two or Tier Three zones.

   Short-term — ***Agency**: (INSERT APPROPRIATE AGENCY)*

3. Publicize the available plots for infill and repurposed development to those starting or maintaining small businesses

   Short-term — ***Agency**: (INSERT APPROPRIATE AGENCY)*

Benchmarks:

- Planning Department examines potential zoning changes for infill development areas.
- Planning Department completes streamlined process that prioritizes mixed-use infill projects.
- Economic Development Department initiates infill development publicity program.
- Mixed use, infill projects move through the approval process within eight months.
- At least five new mixed use infill development projects break ground since 2016.

BUILT ENVIRONMENT ANALYSIS

The following pages are in-depth analyses of each goal and objective - detailing case studies, best practices, and implementation methods. It is meant to be supplementary material that can guide Frederick.

GOAL ONE | OBJECTIVE ONE:

1) Implement a future land-use map identifying sustainability goals and coordinating transit plans with proposed development.

Case Study: Northampton, MA

Northampton, MA identified general land use typologies, not to dissimilar to some of Fredericks current land use zones and then went on to identify the areas which had the greatest potential for high density growth or open space protection, mixed use or industrial, and how they might connect to a meaningful transportation network (City of Northampton 2008).

GOAL ONE:

Integrate sustainability and transportation with land-use planning decisions.

O-1:
Transportation and land use planning are so interwoven however they are commonly housed in different government departments with little conversation about their efforts. Frederick struggles with a lack of integration of the transportation infrastructure into the community fabric, which is most evident in the built environment, where transportation and land use intersect. The planning and development of transportation improvements have not always considered quality-of-life impacts, including accessibility for local residents.

Promote the co-location of residential, commercial, and other uses in new development, to provide residents with a broad range services located close enough for pedestrian access.

Promote mixed-use development in order to reduce the number and length of vehicle trips by providing a more compact street system.
Promote a compact, interconnected street system in order to improve public transit, promote efficient traffic circulation, and provide a better pedestrian environment

With better coordination, communities can plan for the provision of education and other public services, address housing, commercial and retail uses, and ensure equitable access, all in the context of multimodal transportation.

Connecting Land Use and Transportation is exemplified in Freiburg, Germany which transitioned from a very auto oriented city to one of the most sustainable cities in the world (Buehler and Pucher, Sustainable Transport in Freiburg: Lessons from Germany's Environmental Capital 2011). Other examples of working to integrate land use and transportation include Fort Collins, Co 2011 City Plan, where they actively work to fulfill their vision: "Land use and transportation will be fully integrated, both locally and regionally, to create an affordable, accessible, low energy, low impact, and efficient transportation system". (City of Fort Collins 2011) The Sustainable Cities Institute reinforces this recommendation and provide strategies and approaches for implementation (The Sustainable Cities Institute n.d.).

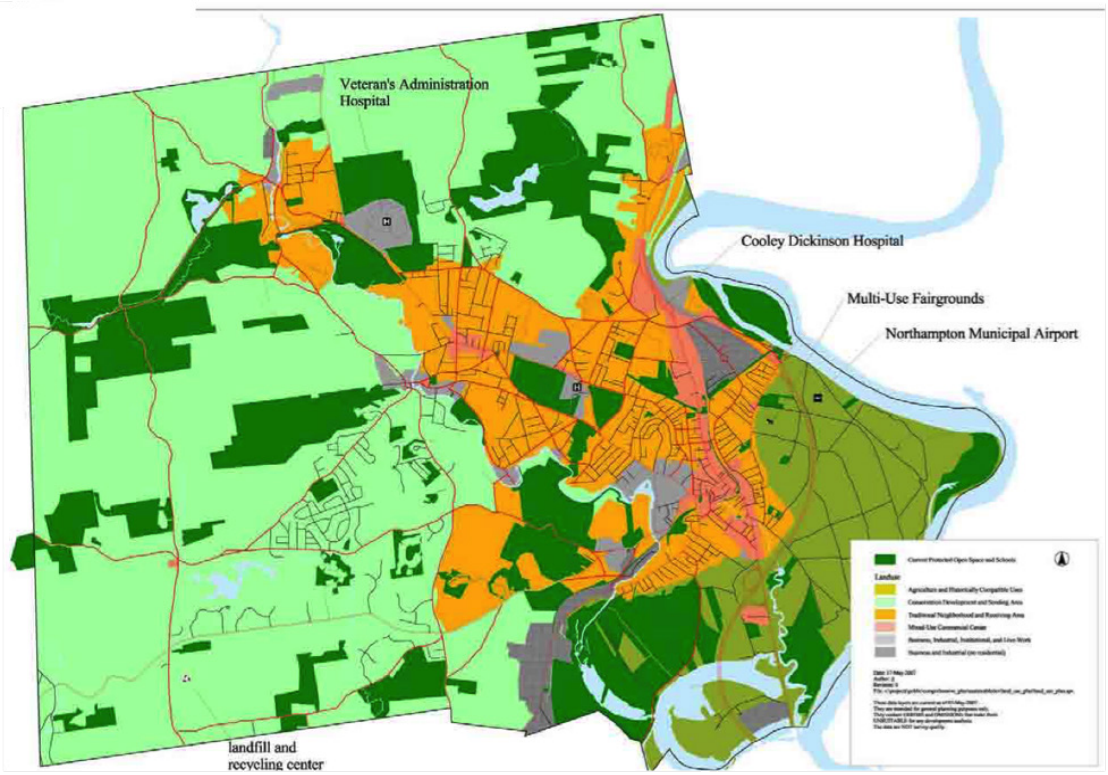
The creation of a Future Land Use Map represents the future vision for the city and can help guide land use decisions towards sustainable principles as Frederick grows. This document can be built upon the small Area Planning goals as well as holistic city goals. The Future Land Use Map would not be a proscriptive regulatory document such as the Zoning Map, but instead would offer broad guidance for making consistent decisions on City actions: programs, land use, regulations, transportation, and capital expenditures.

The future land use map should identify and coordinate important destinations and areas ripe for developing high density mixed use and with transit stops, multimodal transportation and greenway connections. Those connections should also extend to include all the neighborhoods, allowing residents to safely, efficiently, and enjoyably access jobs, amenities and quality recreational areas. The map should identify environmental and agricultural areas to be protected in order to support high water quality and offer food resiliency in the face of potential future hazards. This visionary document proposes what Frederick can be at its very best when land use and transportation plans are fully integrated.

A complement to the future land use map and sustainability plan, which considers the city more

holistically, the small area plans can be a great resource for providing the additional level of detail needed for implementation of sustainability goals. Area plans can be implemented through the Capital Improvements Program (CIP) process, which is the mechanism through which most public improvements are funded (e.g. roads, parks and streetscape). Potential areas have been identified in the 2010 Comprehensive Plan Update as candidates for small area plans including: Central Business District, Rt. 15 Corridor, Golden Mile / US 40 Corridor, Thomas Johnson Corridor, Jefferson Street Corridor, Rosemont Corridor / Ft Detrick Area, East Street Rising. The City already recommends that area plans use the current Land Use Map and Comprehensive Plan for policy guides, so extending that coordination to include sustainability goals, as well as a connected land use and transportation vision, would be in line with Frederick's current approach.

The current small area plans are in large part, corridor focused. However, Frederick is more than its main thoroughfares, it is a City of neighborhoods, each neighborhood a unique destination within the city helping to define the character of the city as a whole. Small Area Planning is a great level to build participatory relationships with the public. As the small area planning process continues and expands, it is important to find opportunities to enhance or create nodes (strategic spots where there is an extra focus and an added concentration of city features) throughout the city, touching all the neighborhoods, in addition to carefully considering how each of those important city moments connect.
Entering the planning process having identified the whole city's transportation strengths and needs, important environmental protection and recreation areas, landmarks and physical feature, current and potential land uses, allows the planner to more clearly see where higher density compact development belongs, where meaningful public spaces can add to a neighborhood's character, and where selective placement on iconic landmarks can tie the city together visually together. Utilizing sustainable design as a guide in the small area plans can not only positively impact the ecosystem, but it can enhance the legibility and livable qualities of the city as a whole.



GOAL ONE | OBJECTIVE TWO - FOUR:

2) Concentrate new development along public transportation corridors, ensuring two-thirds of jobs are located within a quarter mile of a transit stop.

CASE STUDIES:

01 The province of Ontario, Canada has a detailed Handbook outlining their Development Permit System (DPS), a tool that acts as a one stop shop for planning approval. It is designed to assist strategic, integrated and long-term planning and provides developers certainty, transparency and accountability on the requirements. http://www.mah.gov.on.ca/Page5911.aspx

02 The DC Office of Planning's Temporary Urbanism initiative encourages land uses that activate neighborhoods. Temporary interventions, like pop-up shops, guerrilla gardens, parking space parks, art displays and performances, can enliven a neighborhood vacancy, or empty lot until more permanent uses move in. They can also offer the opportunity for budding entrepreneurs to try out a business idea without taking on the risk of a long term lease. Temporary urbanism attracts attention to transportation linked sites with great development potential.

O-2:
Concentrated development along public transportation corridors increases efficiency, people can walk, bike and take transit, helps minimize the impacts of traffic, and provides a rich mix of accessible housing, jobs, shopping and recreational choices. It provides value for the public and private sectors, and residents and helps create a sense of community and of place. Frederick currently uses Planned Neighborhood Development, Traditional Neighborhood Development and Mixed used districts to encourage more compact walkable development, (City of Frederick 2007, Sec 410). There are other tools that might prove valuable for Frederick. One example is expedited permitting. Delays in permit approvals cost local governments millions of dollars in lost revenues, as projects take longer to come on line. Streamlining the permitting process for building, plan, and site permits can also save the design/building industry substantial time and money.

Case Study: Seattle, WA
Priority Green Facilitated program provides developers with reduced and predictable permit timelines, priority processing has an integrated review process to address city-wide code challenges and a single point of contact. In order to participate they need to achieve 10 points on Seattle's Priority Green Facilitated Building Matrix, or achieve a certain level of recognition in the Living Building Challenge (Seattle Department of Planning & Development 2009).

O-3:
Frederick City's shared use path system is a great start on this action. Pairing multimodal transportation infrastructure with local development plans can immediately link destinations to residents. It is important that Frederick extends its multimodal reach to all its neighborhoods, in order to garner economic, environmental and equitable benefits for all its citizens.

O-4:
Frederick City has a great resource in their volunteer boards and committees, but there may be ways to improve the organization and administration of those committees so they may continue to be a vital resource for the City of Frederick in the long term.

Community Development Corporations (CDCs) are nonprofit, community-based organizations focused on revitalizing the areas in which they are located, typically low-income, underserved neighborhoods that have experienced disinvestment. Often celebrated for developing affordable housing, they also get involved in economic development, sanitation, streetscaping, and neighborhood planning projects, and oftentimes provide education and social services to neighborhood residents. Community-Wealth.org offers information and tools for starting and running a CDC. (Community Development Corporations (CDCs) 2015)

Measurement of Progress for Goal 1:

GOAL TWO:

Integrate sustainability and transportation with land-use planning decisions.

3) Plan and implement (number) safe multimodal access areas between high density employment centers, amenities, parks and all city neighborhoods, putting in place pedestrian, bike auto and transit connections from every NAC to major city nodes by (year).

4) Strengthen public participation in the Land-Use decision making process through scheduling (number) of community volunteerism and neighborhood events by (year).

Indicators:

The existence of an updated Future Land Use map that connects transit, sustainability and land use visions.

Number of jobs are located within a 1/4 mile of a transit stop,

Densities of residential and commercial uses within a 1/4 mile of a transit stop

Inclusion of pedestrian, bike, transit and auto connections between major employment hubs and NACs (at least 3 available per NAC – extend those to the county).

Use of Future Land Use Map in small area plans and development investments, approvals and decisions

Potential Challenges:

As addressed in the Plan's Land Use Element and the Community Character and Design Element, the ability to control the character of development is critical to retaining and reinforcing the distinctive quality of Frederick's neighborhoods. The Plan's recommendations on growth management are designed to support the short and long-term livability and attractiveness of Frederick's residential areas and the ability of employment areas to attract and retain development.

Frederick struggles with a lack of integration of the transportation infrastructure into the community fabric. The planning and development of transportation improvements have not always considered quality-of-life impacts, including accessibility for local residents. Because of this history, it will take a long term ongoing effort to reshape attitudes and existing infrastructure.

GOALS IDENTIFIED DURING THE COMPREHENSIVE PLANNING PROCESS INCLUDE:

01 Promote the co-location of residential, commercial, and other uses in new development, to provide residents with a broad range services located close enough for pedestrian access.

02 Promote mixed-use development in order to reduce the number and length of vehicle trips by providing a more compact street system.
Promote a compact, interconnected street system in order to improve public transit, promote efficient traffic circulation, and provide a better pedestrian environment

03 With better coordination, communities can plan for the provision of education and other public services, address housing, commercial and retail uses, and ensure equitable access, all in the context of multimodal transportation.

CASE STUDIES:

03 The City of Fort Collins has 27 standing boards, commissions and authorities consisting of approximately 225 volunteer members. Boards and commissions are established for the purpose of acquiring and studying information in specific areas and to make recommendations to Board of Aldermen on issues within the board's area of expertise. The permanence and organization of these boards helps the City remain strongly connected to its citizens and utilize the citizenry's diverse talents to the long term benefit of Fort Collins. (City of Fort Collins: Board and Commissions 2015)

04 The Southeast CDC in Baltimore has helped their community to restore their main street, reduce vacancies, increase home ownership, increase civic participation, particularly among immigrant groups, support a vibrant arts community, and attract investment while many other areas in Baltimore without that kind of organization support are still floundering with efforts led by neighborhood associations alone. http://southeastcdc.org/

GOAL TWO | OBJECTIVE ONE:

1) Identify (number) of opportunities to retain and build memorable, iconic places that enhance the character, distinguish the neighborhoods and visual connectivity throughout the City of Frederick by (year).

EXAMPLE OF FUTURE FREDERICK CROSS-SECTIONS:

Above: Street section A-A, The Gates

Above: Street section B-B, Jefferson Row

GOAL TWO:

Design healthy, equitable, walkable communities.

O-1:

Tying neighborhoods together with iconic landmarks helps define the unique character of each neighborhood, creates memorable moments, and promotes meaningful spatial references for residents and visitors. Human beings possess preconceived cognitive maps of many of the spaces they traverse and which let them move through and understand their world (Picinali, et al. 2014)Kevin Lynch's research on the mental markers of urban dwellers suggested that the design and planning of urban spaces should be based on people's experience and the ways in which the city could be more legible (Lynch 1960). These ideas about how humans experience the world feed into the ideas of "place making", and how quality walkable spaces as well as distinctive and iconic experiences in a city can add to people's wellbeing and enjoyment of the spaces they interact with on a daily basis.

The preservation of historic structures can support vibrant, walkable communities, by providing a sense of identity and individuality to a place. Frederick City has shown a strong commitment to safeguard the cultural heritage of the city through the Historic Preservation Commission's use of an Historic Preservation Overlay (HPO) zoning district, the Historic Tax Credit Program, Arts and Entertainment District benefits, and a Façade Improvement program through the Downtown Frederick Partnership, Frederick's Main Street organization. Continued revitalization, reinvestment and adaptive reuse of historic buildings are key economic development goals for Department of Economic Development.

Some significant community structures such as the Birely Tannery and the Coke Building don't have official historic designations yet, but they offer opportunities for adaptive reuse. One way the City can help maintain its history and identity, while moving towards a vibrant future is by renovating historic structures to house government departments and complementary community organizations, businesses or functions and continue to encourage and incentives private developers to do the same.

Multiple studies have tied the walkability and health of a neighborhood to the quality and availability of amenities with in a walkable distance, approximate ¼ mile. Taking this information to heart, Walk Score is developing a database of walkable communities using as one of its primary metrics proximity to amenities. Positive amenities can include restaurants, groceries, day cares, dentist offices, banks, retail outlets, educational and recreational facilities and so on. Some businesses have been identified as having a negative effect on residents' health when clustered in communities, such as liquor stores, payday loan brokers, and fast food outlets.

According to WalkScore, the majority of neighborhoods in Frederick are currently highly car dependent. By building an inventory of amenities, Frederick City can begin to have a clearer picture of where planning and zoning can have a positive impact and improve the walkability and general well-being of Frederick's neighborhoods.

O-2:

Walkability is the common term, but it should be understood that is meant to be inclusive of those with disabilities. Walkable, or roll-able, access is a great amenity for a community to have, but when driving is impossible, having neighborhoods with good village centers or basic amenities is not just a nice-to-have, it

2) Plan for making (percentage) of roadways contain sidewalks on both sides and 100 percent of crosswalks are ADA accessible by (year).

2) Convert (percentage) of Frederick's road network to scale appropriate Complete Street designs by (year).

can be a necessity. This is true both in weather emergencies, or even the day to day for those who cannot drive because of a disability, or cannot afford a car. Walkable businesses don't have to take a huge financial hit during weather events and walkable communities are more resilient overall.

O-3:

Complete Streets are designed to enable safe access for all users, including pedestrians, bicyclists, motorists and transit riders of all ages and abilities. Green Streets indicates that the streets are also designed to manage stormwater runoff as a resource. Combined you have streets that are safer, encourage more walking and bicycling, improve water and air quality, and make smart economic sense (Seskin 2015).
Elements you'll find in Complete Green Streets include tree canopies, street side planters or swales, bike lanes, curb bump outs at crosswalks, street side parking, ADA compliant sidewalk widths, design elements that slow vehicle speeds, wide protective medians more frequent pedestrian crossings,
Potential funding sources for green streets listed on the US EPA website: http://epa.gov/region5/sustainable/stormwater-green-streets.html

The Golden Mile, Rosemont, East Patrick and Jefferson Street commercial areas are examples of business areas that express many of the characteristics of strip commercial development. These centers tend to be self-contained with few pedestrian connections to surrounding neighborhoods. In many cases, the design of these centers does not provide for safe and efficient integrated vehicular, bicycle and pedestrian access, thoroughfare or crossings.
In order to provide a more coherent and attractive commercial environment, future redevelopment along these corridors should build more pleasant and safe connections with surrounding businesses and neighborhoods for pedestrians, bicycles and vehicles alike. Efforts to build in human scale as well as smart ecological interventions such as a complete green street approach, can have multi-tiered positive effects including a reduction in vehicular dependence for neighboring residents, as well as help address environmental issues such as heat island effects, carbon emissions and pollution runoff. Increased walkability and bike-ability of business corridors can also bring economic benefits to business through increased foot traffic and health benefits to the city overall.
Potential Improvements to the Golden Mile have been outlined in the Golden Mile Small Area Plan, which already includes many complete green street elements for a more pedestrian and biker friendly experience.
A good illustration can help builders and developers get a clear idea of what is expected of them in when trying to implement a Complete Green Street design (example of contractor specializing in street design, The Toole Design Group in DC www.tooledesign.com.)
Different street types and neighborhood uses will help determine the best design. University of Maryland Architecture graduate students demonstrated several illustrations of street sections and plans for various neighborhoods in Frederick. (Bell 2014)

Approximate range of scores on walkability in Frederick City NACs
Walkability scores from: https://www.walkscore.com/professional/research.php

NAC	Score	Walkability Description
NAC 1	9 – 33	Car Dependent
NAC 2	31 – 41	Car Dependent
NAC 3	0 – 33	Car Dependent
NAC 4	18 – 63	Car Dependent - Somewhat Walkable
NAC 5	19 – 63	Car Dependent – Somewhat Walkable
NAC 6	40 – 59	Car Dependent – Somewhat Walkable
NAC 7	19 – 78	Car Dependent – Very Walkable
NAC 8	28 – 74	Car Dependent – Very Walkable
NAC 9	62 – 69	Somewhat Walkable
NAC 10	54 – 67	Somewhat Walkable
NAC 11	54 – 95	Somewhat Walkable - Walker's Paradise
NAC 12	7 – 35	Car Dependent

The most walkable Frederick neighborhoods are Downtown, Baker Park and Carrollton.

GOAL THREE | OBJECTIVE ONE:

1) The City encourages mixed use, infill development and the repurposing of old structures, with at least (number) such projects breaking ground by (year).

FREDERICK GROWTH THROUGH A PHASED APPROACH

01 Tier One, infill development, is the first priority;

02 Tier Two is development within the municipal growth boundary and is the second priority;

03 Tier Three is land outside the outer boundary and will be examined after the first tiers are substantially developed.

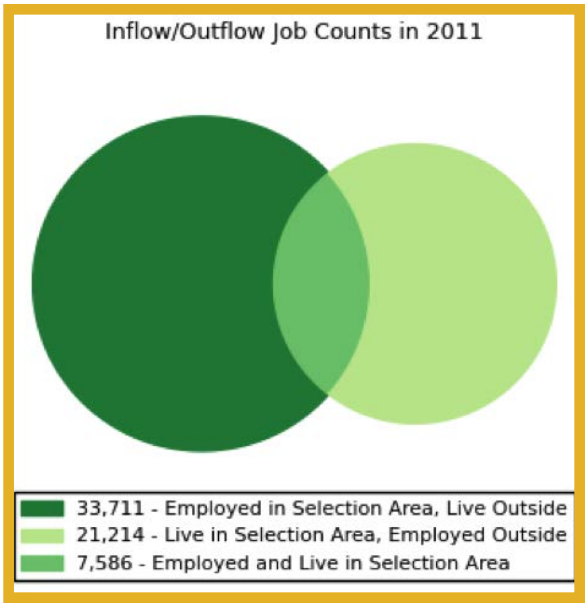
O-1:

The City of Frederick's 2010 Comprehensive Plan defines infill and redevelopment locations as "predominantly west and northwest of downtown, and include redevelopment areas such as the Golden Mile (West Patrick Street), Jefferson Street, Rosemont Avenue, Oppossumtown Pike and US 15 corridors, the area west of downtown between Jefferson Street and Patrick Street, and the industrial area east of the Historic District which includes the new East Street Gateway."

The City should consider the expansion of the City's mixed-use development zoning to cover a greater percentage of City land within Tier One areas. As is evidenced by the City's zoning map, several key locations targeted by the City for infill development, including the Golden Mile and Rosemont Avenue corridors, are covered by several different single-use zones (e.g. commercial, professional business, residential). Mixed use zoning would improve the balance of residential and commercial uses and potentially reduce car dependency.

While infill development is encouraged by the 2010 plan, mixed use infill development projects are not streamlined for quicker review and approval above other development projects before the Planning Commission. A proposed redevelopment of the old Coca Cola factory on N. Market Street encountered what the Frederick News-Post termed a "lengthy, procedure laden process" (Lavin 2015).

Many of the available plots for infill development are small and could be difficult to consolidate for use by larger employers. This presents an opportunity for the City to attract small businesses to develop and operate on these sites and further diversify the city's economy, as identified in the 2010 Comprehensive Plan. This education could take the form of a walking tour of the properties, or a tour of some of the recently rehabilitated plots. Potential partners could include developers of successful infill and rehabilitation



GOAL THREE:

Encourage mixed-use infill and repurposed development within the City of Frederick.

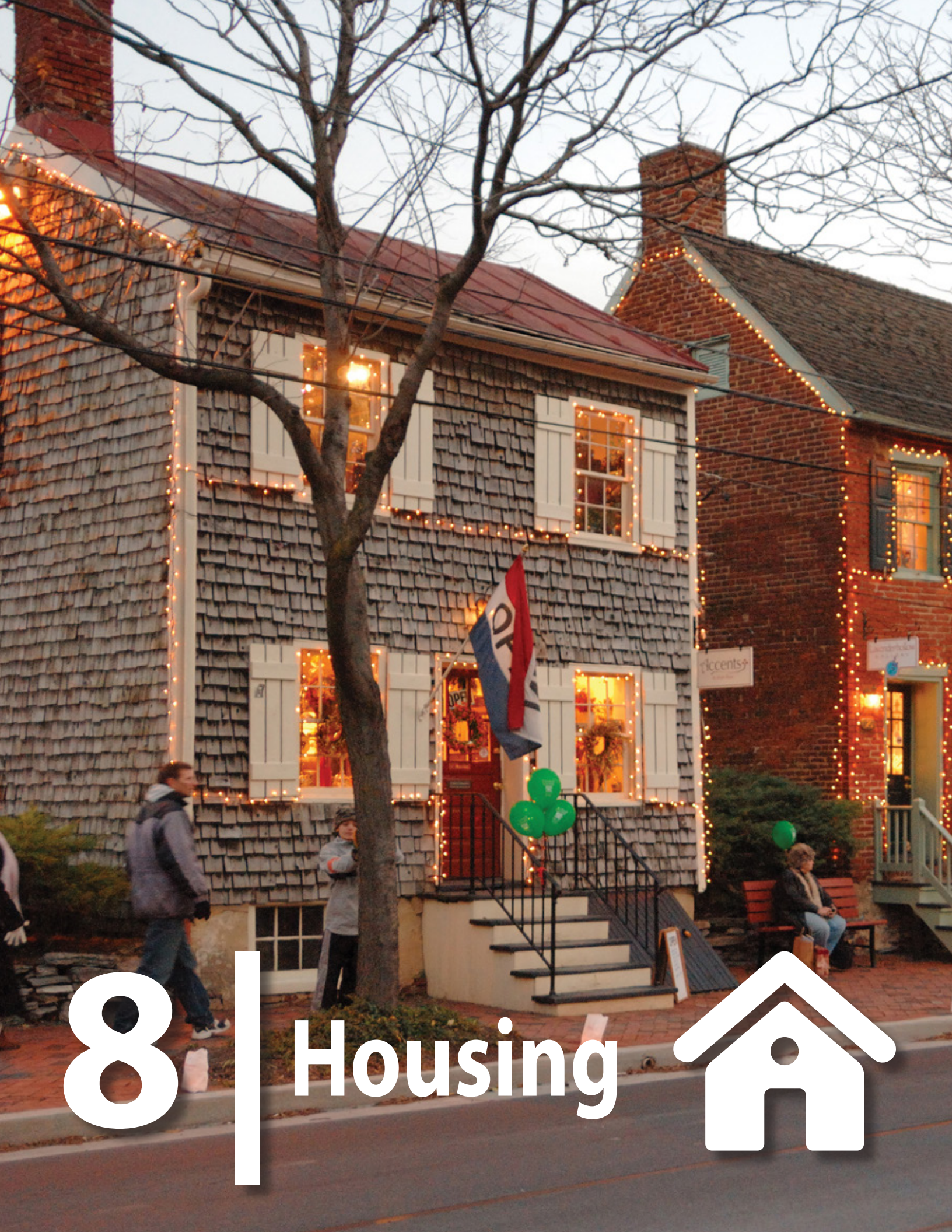
projects and the Frederick County Chamber of Commerce. This outreach work could be incorporated into the Economic Development Department's current small business expansion program, thereby not requiring significant additional funding.

While the City specifies its focus on infill development in its comprehensive plan, it does not emphasize the need for mixed uses. As is evident from the below figure, a minority of people both live and work in Frederick (12 percent), while most people either commute into or commute out of the city. Clearly there is a mismatch of jobs and housing. Fixing this imbalance and encouraging more people to both live and work in Frederick requires that the City prioritize infill development that adds not just housing units but jobs, retail space and other mixed uses.

GOALS, OBJECTIVES AND ACTIONS SUMMARY TABLE

Goal 1: Integrate sustainability and transportation with land-use planning decisions.	
Objective 1: Implement a Future Land-Use Map identifying sustainability goals and coordinating transit plans with proposed development	
1.1.1	Update the Frederick City Future Land Use Map to better represent a sustainable, transportation connected vision of the City of Fred
1.1.2	Require Small Area plans as they are developed city-wide to coordinate with the guidelines provided by the sustainability plan, the
1.1.3	Identify neighborhoods needing improved access to meaningful open space, and identify agricultural lands, open space, riparian bu
1.1.4	Identify areas best suited to higher density, Transit Oriented Development, mixed used zoning, and areas most in need of multimod
Objective 2 : Concentrate new development along public transportation corridors, ensuring (number) of jobs are located within a quarter mile o	
1.2.1	Prepare an information sheet on additional ways to enable, incentivize and streamline development that concentrates density near
Objective 3 : Plan and implement (number) safe multimodal access areas between high density employment centers, amenities, parks and all cit bike auto and transit connections from every NAC to major city nodes by (year.)	
1.3.1	Invest in local and regional multimodal transportation infrastructure planning, design and construction in line with the Future Land
Objective 4: Strengthen public participation in the Land-Use decision making process through scheduling (number) of community volunteerism	
1.4.1	Ease permitting requirements for temporary transformations of vacant spaces into vibrant places for arts, community and commerc
1.4.2	Research potential ways of improving ongoing outreach to citizens of Frederick through long term volunteer committees and boar
Goal 2: Design healthy, equitable, walkable communities	
Objective 1: Identify (number) of opportunities to retain and build memorable, iconic places that enhance the character, distinguish the neighbo	
2.1.1	Identify key locations in Frederick such as view corridors, hilltops, public squares, gateways, centralities, and explore ways best utiliz
2.1.2	Prioritize preservation, restoration and adaptive reuse of historic structures to fill government needs, and support civic, arts, recreat
2.1.3	Prepare an information sheet on the mix of amenities in each NAC, noting how many residents are outside of ¼ mile walking distan
Objective 2: Plan for making (percentage) of roadways contain sidewalks on both sides and 100% of crosswalks are ADA accessible by (year).	
2.2.1	Utilize community charrettes and interactive mapping to help identify, inventory, and remediate pedestrian and bike access barrier
Objective 3: Convert (percentage) of Frederick's road network to scale appropriate Complete Street designs by (year).	
2.3.1	Develop small area plans to include "Complete Green Streets" interventions at visible Frederick corridors
2.3.2	Add illustrations of "Complete Green Street" sections, plans and design details to Frederick City's Land Management Code to help g
Goal 3: Encourage mixed-use infill and repurposed development within the City of Frederick	
Objective 1: The City encourages mixed use, infill development and the repurposing of old structures, with at least (number) such projects breaki	
3.1.1	Expand mixed use zoning within targeted infill development areas
3.1.2	Streamline and prioritize the approval process for mixed-use, infill development and repurposing of old structures, while de-prioriti
3.1.3	Publicize the available plots for infill and repurposed development to those starting or maintaining small businesses

by (year).	TIMEFRAME	LEAD AGENCY
derick	Mid-term	(INSERT APPROPRIATE AGENCY)
Future Land Use Map, transportation plans.	Ongoing	(INSERT APPROPRIATE AGENCY)
uffers and floodplains that should be preserved.	Short-term	(INSERT APPROPRIATE AGENCY)
dal connectors.	Short-term	(INSERT APPROPRIATE AGENCY)
f a transit stop by (year).		
transit stops in harmony with the Future Land Use Map	Mid-term	(INSERT APPROPRIATE AGENCY)
y neighborhoods, putting in place pedestrian,		
Use Map and the sustainability plan.	Ongoing	(INSERT APPROPRIATE AGENCY)
and neighborhood events by (year.)		
cial uses	Short-term	(INSERT APPROPRIATE AGENCY)
ds and community development corporations.	Mid-term	(INSERT APPROPRIATE AGENCY)
rhoods and visual connectivity throughout the City of Frederick		
ze those key locations to create visual markers.	Short-term	(INSERT APPROPRIATE AGENCY)
ional, parks, commercial or residential uses.	Long-term	(INSERT APPROPRIATE AGENCY)
ces from amenities.	Short-term	(INSERT APPROPRIATE AGENCY)
s and put in place needed improvements.	Mid-term	(INSERT APPROPRIATE AGENCY)
	Long-term	(INSERT APPROPRIATE AGENCY)
uide the city departments and developers to best practices	Mid-term	(INSERT APPROPRIATE AGENCY)
ing ground by (year).		
	Mid-term	(INSERT APPROPRIATE AGENCY)
zing the approval process for development in Tier 2 or Tier 3	Short-term	(INSERT APPROPRIATE AGENCY)
	Short-term	(INSERT APPROPRIATE AGENCY)



8 | Housing

Introduction

Goals:

1. Create, programs that incentivize green retrofits of multi-family housing.
2. Incentivize partnerships with CDCs that construct, purchase, and/or manage affordable housing, and investigate other public/ private partnership opportunities.
3. Create stronger policies for developers to include affordable units in their developments, increasing the housing stock diversity.

There is a strong connection between housing and sustainability. In terms of environmental health, reducing home energy-related emissions resulting from heating, cooling, lighting and appliance use can reduce CO2 emissions. Social equity is addressed by increasing the number of housing units that are affordable to low income households and individuals. Having affordable housing opportunities in Frederick enables more current workers – who are employed in Frederick but live outside the city – to live closer to their work and save on commuting costs. While Frederick already has programs in place to incentivize affordable housing development, such as the Moderately Priced Dwelling Unit (MPDU) program, more can be done to enable lower-income households – particularly those who have jobs in Frederick – to live in the city. In addition to government programs, Frederick can incentivize partnerships with community development corporations (CDCs), as well as pursue public/private partnerships to develop affordable housing.

1 Goal: Create, endorse, and encourage programs that incentivize green retrofits of multi-family housing.

Why?

ECONOMY
Decreases costs associated with upkeep of inefficient affordable and/or multi-family units, leading to increased net income; tax credits and rebates decrease associated capital costs for building owners.

ENVIRONMENT
Decreases GHG emissions from multi-family units.

EQUITY
Increases opportunity for money-saving on energy and water costs by low- to middle-income families..

PRECEDENT CITIES:

Chicago, IL - Chicago Retrofit

New York, NY - Carbon Challenge

Potential Challenges with Goal 1:

Lack of grant funding or instability of tax credit programs as some programs phase out or sunset, or are not fully funded from one fiscal year to the next;

Gentrifying housing units by making them more desirable for higher-income potential tenants; and

Lack of owners' ability to coordinate retrofit implementation properly due to poor knowledge of development, of tax incentives available, or through cost-cutting measures in the plan and construction phases.

Objective 1:

50 percent of multi-family units receive a green retrofit or rehabilitation by 2025.

Greening multi-family housing units increases the opportunities for both landlord and tenant to save money through decreased energy costs, decreases dependence on the power grid in the event of an outage, and improves air quality both inside and outside of the building.

Lead agency for objective: *Sustainability Coordinator*

Actions:

1. Pass resolution encouraging all residential housing to perform an energy assessment.

   Short-term **Agency**: Board of Aldermen

2. Draft resolution identifying funds to hire Part Time Equivalent (PTE) employee and support work on multi-family sustainability and green retrofit programs, and outreach materials.

   Short-term **Agency**: (INSERT APPROPRIATE AGENCY)

3. Pass resolution approving funds for PTE and support funds.

   Mid-term **Agency**: Board of Aldermen

4. Inventory all multi-family units and ownership details within the city boundaries.

   Short-term **Agency**: (INSERT APPROPRIATE AGENCY)

   Notes: *Planning department can delegate this task to PTE employee if hired, and should work with Housing Authority to create database.*

5. Create program that educates landlords about retrofits, Identifies tax incentive programs offered by the state and federal government for multi-family green retrofits.

   Mid-term **Agency**: (INSERT APPROPRIATE AGENCY)

   Notes: *Sustainability Coordinator should delegate this task to PTE employee if hired, and should work with Housing Authority*

6. Pass resolution encouraging the County to streamline permitting process by Department of Permits and Inspections for green retrofit construction.

   Mid-term **Agency**: Board of Aldermen

Benchmarks:

- 5 percent of baseline inventory after first two years in implementation stages, with 2.5 percent being in NACs 5 and 8. Additional 5 percent each subsequent year based on 2016 inventory, with 2.5 percent coming from NACs 5, 6, 8, and 9.
- Full 50 percent of existing (baseline) buildings to be fully retrofitted by 2027.

2 Goal: Incentivize partnerships with CDCs that construct, purchase, and/or manage affordable housing, and investigate other public/private partnerships.

Why?

ECONOMY
Decreases travel time and costs for workers who cannot afford to live in the city.

ENVIRONMENT
Enables lower paid workers to reduce their carbon footprint by driving less. Preserves agricultural land that otherwise would have been developed.

EQUITY
Increases quality of life for lower income workers who cannot afford expensive housing.

PRECEDENT CITIES:

Columbus, IN -
Southern Indiana Housing and Community Development Corporation

Atlanta, GA -
Atlanta Regional Commission

Potential Challenges with Goal 2:

Securing grant funds is never a certainty.

Brownfield cleanup costs could be prohibitive.

If PTE employee is not hired, there will be increased workload for individual staff and departments.

Objective 1:

Create partnerships with at least one Community Development Corporation specializing in affordable housing by 2020.

The City of Frederick is growing, the local economy is expanding, and gentrification of low- to mid-income neighborhoods could occur. It is vital to the economy and the equitable values of our society that each resident of Frederick know they can live, work, and play in a safe and healthy Frederick.

Lead agency for objective: *Sustainability Coordinator*

Actions:

1 Inventory potential sites or buildings where affordable housing can be located

Short-term ***Agency****:* (INSERT APPROPRIATE AGENCY)

Notes*: Planning should delegate action to PTE (if hired) and work with local Housing Authority.*

2 Draft resolution endorsing partnership with at least one CDC.

Mid-term ***Agency****:* (INSERT APPROPRIATE AGENCY)

3 Pass resolution endorsing partnership.

Mid-term ***Agency****: Board of Aldermen*

4 Begin a bid process for a public/private partnership with a CDC specializing in affordable housing.

Short-term ***Agency****:* (INSERT APPROPRIATE AGENCY)

Notes*: City should consult with Housing Authority through entirety of proceedings, and CDC should be required to continue relationship with the Housing Authority after partnership is won.*

2 Goal: Incentivize partnerships with CDCs that construct, purchase, and/or manage affordable housing and investigate other public/private partnerships.

Objective 2:

50 percent of greyfield and brownfield sites inside Priority Funding Areas (PFAs) to be used for affordable housing over next 20 years.

Greyfields and brownfields are underutilized areas that are generally located close to other built-up areas and amenities (particularly those located within PFAs), but lack viable tenancy due to earlier construction or industry. These lots could be excellent resources for affordable housing construction, particularly when utilizing the grants available for cleanup through both State and Federal agencies (these can be found in the Analysis portion of this chapter.)

Lead agency for objective: *Sustainability Coordinator*

Actions:

1. Inventory all brown and greyfields in Frederick, with a layer for PFAs.

   Short-term **Agency**: (INSERT APPROPRIATE AGENCY)

2. Identify tax incentives and rebate programs for affordable housing and construction in greyfields and brownfields.

   Mid-term **Agency**: (INSERT APPROPRIATE AGENCY)

   Notes: *Planning should delegate action to PTE (if hired). Work with newly partnered CDC, Housing Authority of the City of Frederick, and/or the Frederick County Affordable Housing Land Trust LLC.*

3. Create a strategic plan for construction or retrofitting of affordable housing buildings.

   Mid-term **Agency**: (INSERT APPROPRIATE AGENCY)

   Notes: *Planning should delegate action to PTE (if hired). Work with newly partnered CDC, Housing Authority of the City of Frederick, and/or the Frederick County Affordable Housing Land Trust LLC.*

4. Add this objective as a priority in each new sector, small area, or comprehensive plan.

   Ongoing **Agency**: (INSERT APPROPRIATE AGENCY)

3 Goal: Create better policies for developers to include affordable units in their developments, increasing the housing stock diversity.

Why?

ECONOMY
Decreases travel time and costs for workers who cannot afford to live in the city.

ENVIRONMENT
Contributes to reduction of greenhouse gas emissions from longer work commutes by non-residents.

EQUITY
Increases quality of life for lower income workers who cannot afford expensive housing.

Objective 1:

Employ a variety of strategies to encourage 5 units of affordable housing for every 100 units of market rate housing built in the city annually.

Frederick's Moderately Priced Dwelling Unit (MPDU) ordinance acknowledges that a "significant housing problem" exists in relation to affordable housing for its low and moderate-income residents. To address this problem, the City should employ various regulations and incentives that encourage the development of affordable housing units. According to the United States Department of Housing and Urban Development (HUD), affordable housing is "housing for which the occupant(s) is/are paying no more than 30 percent of his or her income for gross housing costs, including utilities" (U.S. Department of Housing and Urban Development n.d.).

Lead agency for objective: *Sustainability Coordinator*

Actions:

1. Perform a housing needs assessment which includes a gap analysis to determine the amount of affordable housing needed in the coming years.

   Short-term — ***Agency:*** (INSERT APPROPRIATE AGENCY)

2. Draft resolution increasing the MPDU program's payment-in-lieu-of fee from $16,100 to $25,000.

   Short-term — ***Agency:*** (INSERT APPROPRIATE AGENCY)

3. Explore the option of replacing the MPDU program with a traditional inclusionary zoning ordinance that would require the production of affordable housing units without payment-in-lieu-of fee option.

   Mid-term — ***Agency:*** (INSERT APPROPRIATE AGENCY)

4. Fast-track development review process for affordable housing developments.

   Short-term — ***Agency:*** (INSERT APPROPRIATE AGENCY)

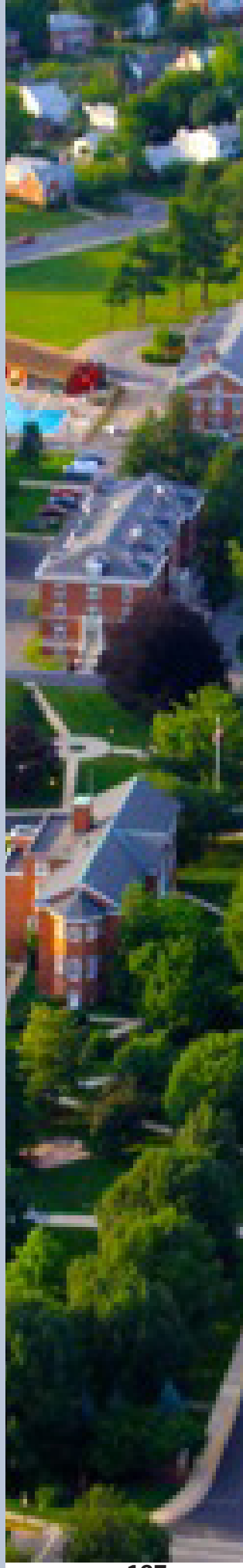
5. Introduce fee waivers or reductions for affordable developments.

   Short-term — ***Agency:*** (INSERT APPROPRIATE AGENCY)

6. Enact flexible design modifications for affordable developments.

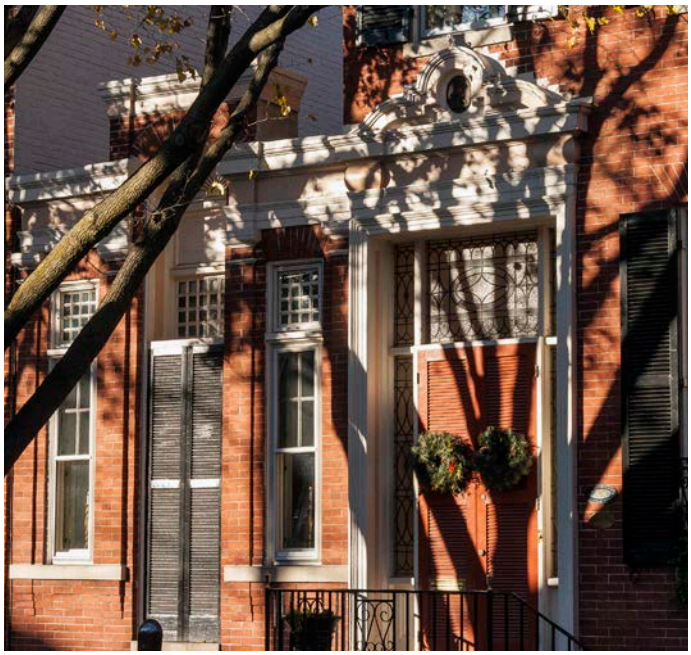
   Short-term — ***Agency:*** (INSERT APPROPRIATE AGENCY)

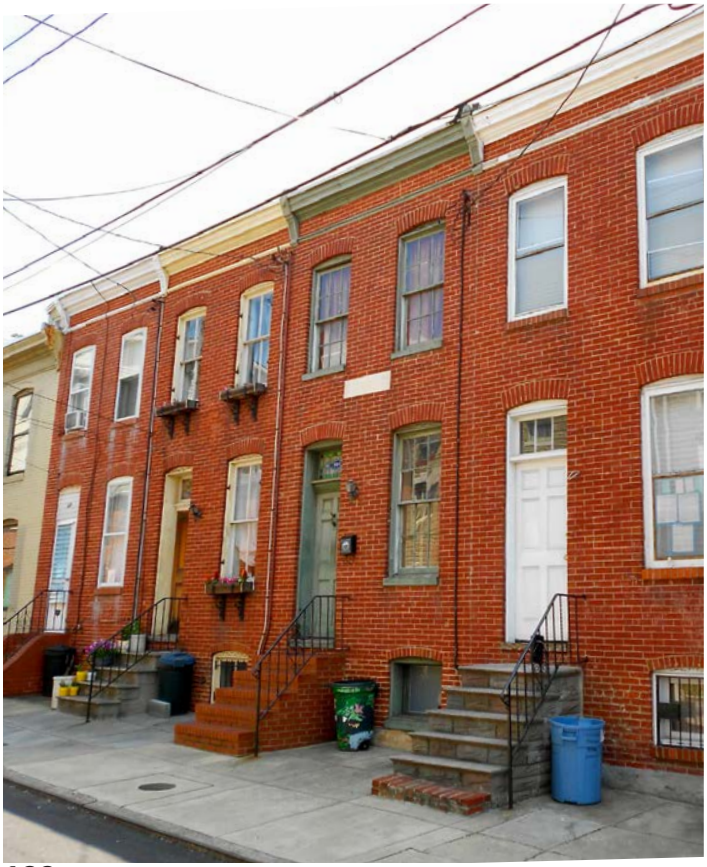
   Notes: *Consider reduced setbacks, infrastructure requirements, open space requirements, landscaping requirements, interior or exterior amenities, and/or parking requirements as well as height restriction waivers.*



HOUSING ANALYSIS

The following pages are in-depth analyses of each goal and objective - detailing case studies, best practices, and implementation methods. It is meant to be supplementary material that can guide Frederick.





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GOAL ONE: | OBJECTIVE ONE:

1) 50 percent of multi-family units to implement green retrofit or rehabilitation program by 2025.

What are some green retrofits available for multi-family development?

Maryland Department of Housing & Community Development's Energy Efficiency Programs (five listed)

Maryland Department of Housing & Community Development's Rental Housing Preservation Program – MD-BRAC – Green Grant.

Department of Energy's "Energy Efficiency and Conservation Block Grant Program

Fannie Mae: Multi-family Green Initiative

HUD's Federal Housing Administration (FHA) and Fannie Mae's Green Refinance Plus program

There are well-known programs giving tax credits or rebates to single-family homes that are retrofitted with energy saving or energy producing green innovations, most of which are part of the U.S. Department of Housing and Urban Development's Sustainable Housing Initiative (U.S. Department of Housing and Urban Development 2015) – many more are listed at the end of this section in bullets. Multi-family units, on the other hand, are often left out or do not have available enough credits to make retrofits economically enticing to building owners or landlords. Yet, smart growth advocates (Calthorpe 2010) (Steffen 2012) suggest that future development should have increased density of units and decreased square footage of living space per person. This will decrease our per capita carbon footprint. In addition, green retrofits of multi-family units should be a high priority.

It is recommended that the City of Frederick make strides to increase opportunities for green retrofits of multi-family housing, which also aligns with regional implementation actions of the Metropolitan Washington Council of Governments' Climate Energy and Environment Policy Committee 2013-2016 Action Plan. Currently both the state of Maryland and the federal government offer tax incentives for multi-family retrofits and rehabilitation.

Many, although not all, of the available tax incentive programs offered by the State or Federal government for multi-family green retrofits are listed to the left.

There are also private underwriting opportunities for low- to middle-income housing units for green rehabilitation: Fannie Mae's Multi-family Green Initiative, and HUD's Federal Housing Administration (FHA) and Fannie Mae's GREEN REFINANCE PLUS program – both listed above. Both New York City and Chicago have made green retrofits for multi-family buildings a priority by identifying credits, grants, and other incentives for building owners. In December of 2013, New York City released the New York City Carbon Challenge, "…a voluntary program to reduce a building's GHG emissions by at least 15 percent over the next ten years. Participants in the Challenge will receive help from a qualified team of professionals to identify cost-saving ways to reduce their building's energy use and begin realizing the benefits of energy efficiency" (Tatum and Irvine 2013). The handbook lays out a step-by-step process for beginning retrofit implementation, from heating and cooling to electricity to energy audits to financing. The handbook gives options for On-Site Generation and Renewables that, while requiring large upfront costs, can decrease energy costs and environmental damage over time. The program has been highly successful and "to date, 17 of the largest residential property management firms in the city have accepted to the Carbon Challenge, and are now in the process of signing up the individual multi-family buildings that they manage" (NYC Mayor's Office of Sustainability 2015).

GOAL ONE:

Create, endorse, and encourage programs that incentivize green retrofits of multi-family.

The Retrofit Chicago program also identifies tax credits, connects applicants with respected contractors, and offers free energy saving items. Unlike New York's program, Chicago allows renters to also apply for participation (City of Chicago 2014). Both cities have also created pilot programs (National Housing Trust 2009) utilizing the U.S. Department of Energy's Energy Efficiency and Conservation Block Grant (EECBG) program, earmarking funds for multi-family retrofits (Office of Energy Efficiency & Renewable Energy 2015).

The reason for New York City's and Chicago's success is in part because of the staff dedicated to the cause. Each city hired employees to work on finding the incentives, consulting with experts, and earmarking funds for multi-family retrofits. Currently, the City of Frederick does not have any one person on staff working on affordable housing issues or opportunities. While there is a direct relationship with the Housing Authority of the City of Frederick (HACF), their three departments, "The Department of Physical Services, which is responsible for all maintenance and modernization; The Department of Finance, which is responsible for all administrative, accounting, and procurement functions; and the Department of Housing, which is responsible for overall housing operations," (Housing Authority of the City of Frederick 2015) do not prioritize green retrofits or rehabilitation, nor do they have the funds to do so. Nevertheless, the HACF will be an invaluable resource for data, inventory, identification of needs and targets for easiest implementation. It is recommended that the city hire or contract out a part-time equivalent (PTE) position to work with the HACF and the City's sustainability coordinator on identifying tax credits, rebates, and other opportunities for low- to middle-income multi-family housing greening. That same person should also be tasked with creating a database that inventories all multi-family units and prioritize those that house low- to middle-income residents while also creating strategies for education and outreach to families of those units.

Below are excellent resources (toolkits, handbooks, resources, and programs already established in other cities) for implementing a successful multi-family green retrofit and rehabilitation program:

By passing resolutions that support green retrofit efforts for multi-family housing, the Board of Aldermen can improve nonprofits' and the HACF's abilities to spend more time and money working with the city's housing stock, and help support the local economy through job growth. According to an extensive report by Deutsche Bank, "$40 billion are invested annually in residential retrofits nationwide; an average of 10 jobs are created per million dollars invested; and a total of 4 million jobs are created on an annual basis as a result of energy efficiency improvements" (Deutsche Bank 2012). By investing a small amount of money in at least one staff member to take on this project, the City could indirectly

TOOLKITS AND RESOURCES FOR Multi-family GREEN RENOVATION:

1. National Housing Trust's Green Preservation

2. Affordable Community Energy

3. Energy Programs Consortium's Multi-family Energy Efficiency: Reported Barriers and Emerging Practices

4. SPUR Report, Greening Apartment Buildings:

5. Institute for Market Transformation: A Map to Planning Retrofits in Multi-family Buildings

6. New Buildings Institute's Organization Focused on Multi-family Energy Efficiency

7. Enterprise Community's Green Multi-family Retrofit Program

8. The United States Conference of Mayors' Successful City Initiatives with Energy Efficiency and Conservation Block Grant (EECBG) Funding

GOAL ONE | OBJECTIVE ONE:

1) 50 percent of multi-family units to implement green retrofit or rehabilitation program by 2025.

BENCHMARKS

It is important that those buildings with the greatest need receive particular help. Thus, priority should be placed on buildings located in NACs 5 and 8 first, as they contain the highest populations of all the other NACs while also having high percentages of poverty, immigrant populations, and lower household median incomes. After the first two years of implementation, the priority should extend – while still including NACs 5 and 8 – to the adjacent NAC 6 and NAC 9 areas. See Appendix A for data and spatial information about NACs.

bring jobs needed for green retrofits and rehabilitation to the city. By hiring a staff member, landlords will have a single person to help walk them through the many tax credit, rebate, loans, and other incentives that will ease the burden of initial capital costs for green retrofits.

Local regulations can aid in helping the programs' progress. Examples of green retrofit laws and regulations are found in a toolkit from the United States Green Building Council (United States Green Building Council 2011). One option is for the City Aldermen to encourage that home and rental housing owners arrange for a residential energy assessment. Among the many assessment options are the Energy Star (Home Energy Audits 2015) (Home Performance with Energy Star 2015). However, the United States Department of Energy has also compiled invaluable information through both a video (Professional Home Energy Audits 2014) and infographic (Energy Saver 101 Infographic: Home Energy Audits 2013) that can instruct residents to conduct their own energy audit.

Another strategy option is to streamline the permitting process for retrofit construction permits. A 2015 report by Stop Waste, a public sustainability agency in Alameda County, California, stated that streamlining the permits process – even suggesting that it become electronic – was a high priority after finding the efforts for retrofits through the Bay Area Regional Energy Network (BayREN) were stymied by the permitting process (Sullens 2015). It was a similar situation that prompted Los Angeles Mayor Eric Garcetti in 2014 to streamline the process for L.A. residents for installation of solar photovoltaic systems on their homes or property. The Mayor's office estimated that up to $900 could be saved by speeding up the permitting process (Electrical Construction & Maintenance 2014). The Brookhaven, New York Town Board "cut [the] red tape" so residents could more easily go green (Town of Brookhaven 2009). In fact, it has been noted that some "cities will waive or reimburse application, building, or permit fees for specific levels of LEED and other green building rating systems" (Multi-family Executive 2010) to make the cost of permits less burdensome. However, streamlining the process is not just about time and money; it also shows landlords and contractors that the County takes green retrofitting and rehabilitation seriously and encourages those property owners who may begrudge the arduous task of obtaining permits to go ahead with plans to green their buildings (The American Institute of Architects 2012).

GOAL ONE:

Create, endorse, and encourage programs that incentivize green retrofits of multi-family.


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CITY HALL

GOAL TWO | OBJECTIVE ONE:

1) Create partnerships with at least one community development corporation specializing in affordable housing by 2020.

REPORTS AND RESOURCES

These two reports that should be referred to during this process.

1 Urban Land Institute's Ten Principles for Successful Public/Private Partnerships

2 Metropolitan Washington Council of Government's Finding a Way Home: Building Communities with Affordable

The Metropolitan Washington Council of Governments (MWCOG) projects an increase in employment opportunities, particularly in employment centers. The City of Frederick has five such centers with a projected population increase of 133 percent in the downtown area alone between 2010 and 2040 (Metropolitan Washington Council of Governments 2013). MWCOG's goal for the region is to "Ensure that one new housing unit is produced for every 1.6 jobs that are produced in the region" (Metropolitan Washington Council of Governments 2001). Not all of these jobs will be high-skilled, high-earning jobs, so affordable housing opportunities are needed low- to mid-income earning families.

Partnering with a nonprofit organization or a community development corporation (CDC) specializing in providing affordable housing can create many opportunities for the local economy and quality of life in any city.

The proportion of income The proportion of income spent on housing, alone, is no longer an appropriate indicator for housing affordability – generally deemed 30 percent of annual take-home salary (Scwartz and Wilson 2007). In fact, due to increased distances families are willing to travel to obtain the home they want while also keeping their jobs, transportation costs have now become part of the 'housing' expense – an expense that must also fit within the 30 percent range to be considered affordable (Center for Neighborhood Technology 2015). For some people, generally mid- to high-wage earners, this lifestyle is feasible. For others, being able to own both a car and have an affordable home is out of reach or a burden, no matter how far they drive.

For senior citizens in our metropolitan area, getting to work is not the prevailing problem, but rather getting access to amenities within public transit or walking distance. Some of our senior citizens – many of whom may have lived in Frederick a large percentage of their lives – can either no longer afford to own a home, and/or would prefer to live in a walkable area.

By creating public/private partnerships with Community Development Corporations specializing in affordable housing units, the City of Frederick can strengthen their local economy, cut down on emissions, and increase the quality of life for all their residents. "Combining strengths and resources, the public and private sectors are working together to achieve common goals. By partnering and sharing the risks and rewards, they are able to revitalize urban and suburban communities by developing projects—such as mixed-use communities, affordable housing, convention centers, and airports—that might otherwise have been impossible to develop using more traditional methods" (Corrigan, et al. 2005). It is important to acknowledge the new nonprofit enterprise located in Frederick County, the Frederick County Affordable Housing Land Trust LLC (Land Trust) "whose purpose is to ensure a sustainable supply of affordable housing. Through a partnership with the Board of County Commissioners (BoCC) of Frederick County, the Land Trust acquires properties, rehabilitates if necessary, and sells the properties to

GOAL TWO:

Incentivize partnerships with CDCs that construct, purchase, and/or manage affordable housing, and investigate other public/private partnerships.

"It is vital to the economy and the equitable values of our society that each resident of Frederick know they can live, work, and play in a safe and healthy Frederick."

qualifying homebuyers. The new homebuyer owns the improvements, and the Land Trust retains ownership of the land. Through a recorded Land Trust Agreement, the property remains affordable to generations of future homebuyers" (Frederick County Government Maryland 2014). While the Land Trust would be a valuable partner in this effort, along with the Housing Authority of the City of Frederick, both deal in either homeownership, or housing communities that only meet the needs of low-income residents, respectively. It is important to recognize that many hardworking individuals who seemingly make stable wages with stable jobs vital to a working city still experience housing cost burden as they spend more than 30 percent on their housing and transportation costs (U.S. Department of Housing and Urban Development 2015). These middle-income households must also have a place to live that is stable, clean, and located in a healthy environment.

The City of Columbus, Indiana recognized this opportunity when a property that provided safe and affordable units for seniors citizens with fixed and very-low incomes was at risk of being sold to market-rate investors. The City partnered with a nonprofit and with local businesses to purchase the property and transfer the ownership to a CDC. "[The] residents live at the downtown Columbus complex for an average stay of 10 years. Their average monthly rent is $350. The property's new ownership, Southern Indiana Housing and Community Development Corporation (SIHCDC), will provide assistance to income-eligible seniors, home maintenance training and an aging-in-place assessment program that allows older residents to stay in their homes longer" (City of Columbus 2015).

Chattanooga, Tennessee, Portland, Oregon's South Waterfront Central District Project, Breckenridge, Colorado's Wellington neighborhood are all examples used by the Urban Land Institute to highlight successful public/private partnerships that reinforced the stable foundation of affordable housing (Corrigan, et al. 2005). Even in the Metropolitan Washington Region, however, there are excellent examples of public private partnerships. Neighborhood Development Company (Neighborhood Development Company 2015) specializes in affordable, below-market and mixed-use housing (in contrast to the Housing Authority for the City of Frederick's low-income, subsidized housing), and participates in public private partnerships that increase visible, quality housing for the region while decreasing the necessity for government intervention or subsidy.

The City of Frederick is growing, the local economy is expanding, and gentrification of low- to mid-income neighborhoods will happen. It is vital to the economy and the equitable values of our society that each resident of Frederick know they can live, work, and play in a safe and healthy Frederick. By utilizing public private partnerships, Frederick can accomplish this goal without increasing taxes or workload of current City employees.

GOAL TWO | OBJECTIVE TWO:

2) Have 50 percent of greyfield and brownfield sites in Frederick be used for affordable housing over next 20 years.

TOOLKITS AND RESOURCES:

These are resources for Frederick to utilize as it redevelops greyfield sites

- Community Choices' Quality Growth Toolkit: Greyfield Redevelopment
- Connect Our Futures' Brownfield/Greyfield Redevelopment Toolkit
- Connect Our Futures' Brownfield-Greyfield Redevelopment Financing Toolkit for Local Government

Targeting greyfields and brownfields in Maryland has already begun as a strategy for smart growth and community revitalization. For example, "the new Strategic Demolition and Smart Growth Impact Fund (SGIF) is seeking to catalyze activities that accelerate economic development, job production and smart growth in existing Maryland communities. The SGIF aims to improve the economic viability of "grey field development" which often faces more barriers than sprawling "green field development" (Maryland Department of Housing and Community Development 2015). Another example is Maryland's Brownfields Revitalization Incentive Program, "intended to promote economic development, especially in distressed urban areas, by identifying and redeploying underutilized properties" (Maryland Department of the Environment 2015). With many success stories it's not difficult to see how revitalizing these vacant lots is the next best step for the local economy, for environmental stewardship, and equitable opportunity (United States Environmental Protection Agency 2015).

There is a smaller contingent around the country and abroad, however, that has connected the notion of prioritizing these sites with affordable housing. Three main reasons for building are cited in the American Journal of Public Health, "First, brownfields were considered to be a ready supply of available land upon which to build, and housing was in large demand… Second, in some cities, brownfields are the only readily available supply of land for new housing and schools… the third reason to build housing on brownfields is to improve neighborhood quality and the environment. Crime and physical decay kill neighborhoods as well as mentally and physically wound their residents" (Greenberg, Should Housing Be Built on Former Brownfield Sites? 2002). Furthermore, "building affordable housing for the existing residents of cities and new migrants and attracting the atypical middle- and upper-class resident who wants to return to the city with high-quality housing in attractive neighborhoods are clearly much needed improvements over thousands of dilapidated brownfield eyesores" (Greenberg, Craighill, et al. 2010). Some cities or states have enacted legislation to incentivize building affordable housing in grey and brownfields, like the Incentive Housing Zone overlay zone program in Connecticut established in 2007 that provides monetary incentives to municipalities for every new housing unit and every new building permit (Regulatory Barriers Clearinghouse 2008). In Florida there is a sales tax refund for building materials used in brownfield housing projects, as well as a voluntary cleanup tax credit (Lichtstein 2012). The voluntary cleanup tax credit is also available in Maryland called the Voluntary Cleanup Program which, through the Maryland Department of Business and Economic Development, gives grants, tax incentives, and loans for redevelopment of brownfield sites (Maryland Department of the Environment 2013). The Environmental Protection Agency also gives brownfield grants through their specialized EPA Brownfields Program (The Environmental Protection Agency 2015).

Greyfields, while equally

GOAL TWO:

Incentivize partnerships with CDCs that construct, purchase, and/or manage affordable housing, and investigate other public/private partnerships.

poor for the local economy and aesthetic, find themselves on a different, newer platform of change. Beginning with the death of the shopping mall – a pattern that the United States and Australia began to witness nearly twenty years ago – the idea of greyfield redevelopment emerged as a necessity in the early 2000s (Feronti 2003) and picked up speed into the 2010s (Newton, Newman, et al. 2012). The country most interested in greyfield development in the 2000s has been Australia in response to the huge vacant commercial districts blighting their suburban areas. However, in recent years even news outlets have picked up on the declining appeal of malls, office parks, stripmalls and the like in the United States (Uberti 2014).

"The growing number of older commercial centres (sic) — whether shopping malls, strip malls or retail plazas present promising opportunities for intensifying and revitalizing cities. These 'greyfields' are composed of failed or failing retail uses and their associated parking lots. These sites are now coming full circle as their owners look for alternative uses such as housing" (Canada Mortgage and Housing Corporation 2015). While many U.S. cities are still figuring out how best to utilize these vacant areas in their towns, the Atlanta Regional Commission has taken hit the ground running, creating a toolkit for other cities and towns to determine whether or not the best use for their greyfields are in redevelopment.

Prioritizing redevelopment of brown and greyfields located inside of Maryland Priority Funding Areas (PFAs) will increase the likelihood of redevelopment happening because they are areas delineated by the State of Maryland to fall within smart growth management and have availability or plans for sewer or water systems. "The following areas qualify as Priority Funding Areas: every municipality, as they existed in 1997; areas inside the Washington Beltway and the Baltimore Beltway; and areas already designated as enterprise zones, neighborhood revitalization areas, heritage areas and existing industrial land" (Maryland Department of Planning 2015)

While Maryland Department of the Environment has not developed a comprehensive brownfields list because of the "stigma that may be attached to the sites included on such a list," (Maryland Brownfields and Voluntary Cleanup Program Project Sites 2015) they have spatially mapped those locations that are participating in the Land Restoration Program and have created factsheets about each site that is participating ordered by county. This should be used as a jumping off point when creating an inventory of all brown and greyfields within the city boundaries.

RESOURCES:

For a map of Maryland PFAs visit the following link:

http://mdpgis.mdp.state.md.us/PFA/publicinfotemplate/index.html.

GOAL THREE | OBJECTIVE ONE:

1) Employ a variety of strategies to encourage 10 units of affordable housing for every 100 units of market rate housing built in the city annually.

"By any measure, the MPDU program is not working as intended. The failure of the MPDU program to produce any moderately priced dwelling units since its inception leaves the city with two options: modify the program or replace it with a pure inclusionary zoning ordinance."

According to recent American Community Survey data, over 14 percent of Frederick's households are spending more than 50 percent of their income on housing (U.S. Department of Housing and Urban Development 2015). By the current U.S. Department of Housing and Urban Development's definition, these households are classified as "severely cost burdened" (U.S. Department of Housing and Urban Development 2015). Severely cost burdened households dedicate such a large portion of their income to housing, that they are forced to sacrifice other necessities such as food, healthcare, education, etc. As Frederick continues to grow and increasing strain is put on the housing market, the percentage of severely cost burdened households will only grow. Frederick must do more to promote affordable housing to ensure an equitable and sustainable future for its citizens.

The City encourages the production of affordable housing mainly with funds from the Community Development Block Grant (CDBG) program. The City's CBDG 2014 Action Plan specifies an annual affordable housing goal of 27 units (Frederick Department of Planning, 2014). Considering that thousands of households are severely cost burdened, this number is far too low to have a significant impact on affordability. To gain a better understanding of the present need for affordable housing in Frederick, the City should conduct a comprehensive housing needs assessment. This assessment should include a detailed gap analysis showing which income groups are most in need of targeting policies to promote housing. The target of 10 units of affordable housing for every 100 units of market rate was thought to be a reasonable, attainable mark; however, an updated figure should be determined based on the City's recommended housing needs assessment and gap analysis.

In December 2008, Frederick passed Ordinance No. G-08-20 establishing its MPDU program (City of Frederick). The program requires that all new residential developments comprised of 25 units or more set aside 12.5 percent of the total number of units as affordable. In exchange, developers are allowed to exceed the maximum allowable density in the zoning district based on the percentage of dedicated affordable units. However, developers have the option to pay a fee of $16,100 per unit in lieu of actually reserving the units as affordable. To date, every developer has opted to pay the fee in lieu of providing the affordable units.

By any measure, the MPDU program is not working as intended. The failure of the MPDU program to produce any moderately priced dwelling units since its inception leaves the City with two options: modify the program or replace it with a pure inclusionary zoning ordinance. To modify the program, the City should increase the payment-in-lieu-of fee for the MPDU program $25,000. This figure is open to review if further research concludes that a different fee structure would be more effective. The increased fee should encourage more developers to provide affordable units rather than pay to not participate in the program. Rather than modify the program, the City could choose to adopt a traditional inclusionary zoning model. This type of zoning would require, rather than encourage, the construction of affordable units for developments larger than a certain size.

GOAL THREE:

Create better policies for developers to include affordable units in their developments, increasing the housing stock diversity.

GOALS, OBJECTIVES AND ACTIONS SUMMARY TABLE

Goal 1: Create, programs that incentivize green retrofits of multifamily housing.	
Objective 1: 50% of multi-family units receive a green retrofit or rehabilitation by 2025.	
1.1.1	Pass resolution encouraging all residential housing to perform an energy assessment
1.1.2	Draft resolution identifying funds to hire Part Time Equivalent (PTE) employee and support work on multi-family sustainability and gre
1.1.3	Pass resolution approving funds for PTE and support funds.
1.1.4	Inventory all multi-family units and ownership details within the city boundaries.
1.1.5	Create program that educates landlords about retrofits, Identifies tax incentive programs offered by the state and federal govern
1.1.6	Pass resolution encouraging the City to streamline permitting process by Department of Permits and Inspections for green retrof
Goal 2: Incentivize partnerships with CDCs that construct, purchase, and/or manage affordable housing, and investigate	
Objective 1: Create partnerships with at least one Community Development Corporation specializing in affordable housing by 2020.	
2.1.1	Inventory potential sites or buildings where affordable housing can be located.
2.1.2	Draft resolution endorsing partnership with at least one CDC.
2.1.3	Pass resolution endorsing partnership.
2.1.4	Begin a bid process for a public/private partnership with a CDC specializing in affordable housing.
Objective 2 : 50% of greyfield and brownfield sites inside Priority Funding Areas (PFAs) to be used for affordable housing over next 20 years.	
2.2.1	Inventory all brown fields in Frederick, with a layer for PFAs.
2.2.2	Identify tax incentives and rebate programs for affordable housing and construction in greyfields and brownfields.
2.2.3	Create a strategic plan for construction or retrofitting of affordable housing buildings.
2.2.4	Add this objective as a priority in each new sector, small area, or comprehensive plan.
Goal 3: Create better policies for developers to include affordable units in their developments, increasing the housing stock diversity.	
Objective 1: Employ a variety of strategies to encourage 5 units of affordable housing for every 100 units of market rate housing built in the city annually	
3.1.1	Perform a housing needs assessment which includes a gap analysis to determine the amount of affordable housing needed in the co
3.1.2	Draft resolution increasing the MPDU program's payment-in-lieu-of fee from $16,100 to $25,000.
3.1.3	Explore the option of replacing the MPDU program with a traditional inclusionary zoning ordinance that would require the productior
3.1.4	Fast-track development review process for affordable housing developments.
3.1.5	Introduce fee waivers or reductions for affordable developments.
3.1.6	Enact flexible design modifications for affordable developments.

	TIMEFRAME	LEAD AGENCY
	Short-term	Board of Aldermen
een retrofit programs, and outreach materials.	Short-term	(INSERT APPROPRIATE AGENCY)
	Mid-term	Board of Aldermen
	Short-term	(INSERT APPROPRIATE AGENCY)
ament for multi-family green retrofits.	Mid-term	(INSERT APPROPRIATE AGENCY)
fit construction.	Mid-term	Board of Aldermen
other public/private partnerships.		
	Short-term	(INSERT APPROPRIATE AGENCY)
	Mid-term	(INSERT APPROPRIATE AGENCY)
	Mid-term	Board of Aldermen
	Short-term	(INSERT APPROPRIATE AGENCY)
	Short-term	(INSERT APPROPRIATE AGENCY)
	Short-term	(INSERT APPROPRIATE AGENCY)
	Mid-term	(INSERT APPROPRIATE AGENCY)
	Ongoing	(INSERT APPROPRIATE AGENCY)
ming years.	Short-term	(INSERT APPROPRIATE AGENCY)
	Short-term	(INSERT APPROPRIATE AGENCY)
n of affordable housing units without payment-in-lieu-of fee option.	Mid-term	(INSERT APPROPRIATE AGENCY)
	Short-term	(INSERT APPROPRIATE AGENCY)
	Short-term	(INSERT APPROPRIATE AGENCY)
	Short-term	(INSERT APPROPRIATE AGENCY)

9 | Transportation

Introduction

Goals:

1. Maximize City employee use of non-automobile transportation.
2. Reduce automobile dependency among city residents.
3. Encourage sustainable policies, regulations, and laws at the City and County level.

Frederick must ensure that all residents and visitors – whether or not they own automobiles – are able to access all places and amenities within the city, and provide for mobility for all residents throughout the city. The City has made great strides to provide a range of transportation options in recent years. For example, nearly half of the City's planned 25 miles of shared use bike paths have been constructed as of 2014, the public bus system will add electric buses to its fleet in the near future, and a downtown bus circulator has been proposed. However, driving remains the easiest way to get to and around Frederick. Reducing the need for car trips by both City employees on official business and residents as they go about their daily lives and developing a comprehensive, sustainable transportation policy at both the City and County levels will create a variety of benefits for everyone in Frederick. With electric buses, there are economic benefits for the City such as decreased fuel and vehicle maintenance costs for the City, and access to additional job opportunities for city residents – especially those who do not own their own cars. There are also environmental benefits such as improved air quality as a result of fewer vehicle emissions and the use of alternative fuels. Finally, a healthier, more sustainable community can be achieved if residents and City employees alike have the opportunity to incorporate walking or cycling in to their daily routines.

Successes to Date:

1. At least 10 of the 25 planned shared use path miles have been installed;
2. Shared bike markings and bike lanes have been installed around the city; and
3. Wider sidewalks have been created.

1 Goal: Maximize City Employee use of non-automobile transportation.

Why?

ECONOMY

Reducing City employee use of automobiles saves the City the costs of fuel, vehicle maintenance, and insurance. In addition, it allows the City to purchase fewer new vehicles. Separately, the health and fitness benefits of active transportation may increase productivity, reduce sickness absence, and decrease healthcare costs for the city.

ENVIRONMENT

Reducing City employee use of automobiles reduces the amount of greenhouse gas emissions and air pollution from automobiles. These reductions have local and regional benefits.

EQUITY

Increasing the numbers of City employees who walk, bicycle, and/or take public transportation will result in improved fitness for employees due to both increased physical activity and improved air quality, as well as create a culture of health and wellness among employees.

Potential Challenges with Goal 1:

City employees may be reluctant to participate in programs requiring them to walk or bicycle when such trips were previously permitted to be made by automobile. Outreach to employees discussing the benefits of these programs, as well as corresponding concessions to employees such as allowing telework and permitting them to forego parking privileges in exchange for the value of that benefit, will help to make these programs more appealing to employees.

Some City employees and employee supervisors may be cautious about implementing telecommuting programs, as they may fear that employees working remotely will be less productive. Research has shown that this is not the case, and that in some cases telecommuting actually improves productivity (Dutcher and Saral 2012, Ahmed, et al. 2014).

Objective 1:

(Percentage) of trips on City business of less than a half-mile are required to be made on foot, unless vehicle is required, by (year).

A 10-minute walk is generally not substantially slower than the time required to retrieve a vehicle, drive to a nearby destination, and locate a parking space. Most emissions and gas inefficiencies happen within the first miles of a car trip.

Actions:

1. Create buffer maps surrounding each City department of ½ mile showing 'walkable' distances

   Short-term **Agency**: *(INSERT APPROPRIATE AGENCY)*

   Code Enforcement should work with Permitting Department, Street Lighting & Traffic Control Department

Objective 2:

Non-automotive commute incentive available to (percentage) of City employees by (year).

The City should implement an incentive for employees to commute by non-automotive means. This incentive should be at least as valuable as the cost assumed by the City to supply free parking for City employees. In addition, the City should allow employees to opt out of parking benefits and receive instead the value of that benefit.

Actions:

1. Determine cost assumed by City for free parking

   Mid-term **Agency**: *(INSERT APPROPRIATE AGENCY)*

   Transportation should work with planning staff to assess land values for parking spaces, determining opportunity cost as well as capital cost for free parking.

2. Identify funding in budget for at least 25 percent of employees to receive value of parking

   Mid-term **Agency**: *(INSERT APPROPRIATE AGENCY)*

3. Write summary of benefit programs for Administrative approval

   Mid-term **Agency**: *(INSERT APPROPRIATE AGENCY)*

   Transportation should utilize programs identified in the Analysis portion of this chapter.

Benchmarks:

- All trips on City business under ½ mile conducted on foot by 2020.
- 50 percent of all trips on City business under 2 miles conducted by bicycle by 2020.

1 Goal: Maximize City Employee use of non-automobile transportation.

Objective 3:

City fleet of bicycles available to (percentage) of employees by (year).

The City should purchase a fleet of bicycles, to be stored at City offices throughout Frederick, for use by City employees during working hours. Therefore, even City employees who drove or took public transportation to work would be able to use bicycles to travel during the day, and bicycles could assume a greater share of short- to medium-length trips for City business.

Actions:

1. Needs assessment for each department/building

   Mid-term **Agency**: (INSERT APPROPRIATE AGENCY)

   Based on trips made out of building, the length of trips in miles, and the number of employees in each building, the assessment should determine how many bikes per building.

2. Locate spaces for bikes at buildings where bikes will be located

   Mid-term **Agency**: (INSERT APPROPRIATE AGENCY)

   Parking should discuss with Planning on this action.

3. Identify funding for bike fleet, and plan for maintenance.

   Short-term **Agency**: (INSERT APPROPRIATE AGENCY)

   Code Enforcement should work with Permitting Department, Street Lighting & Traffic Control Department

Objective 4:

(Percentage) of fixed-location workers telecommuting once per week by (year).

Allowing employees to work from home would decrease expenses and the stress of commuting for employees, and would decrease the number of vehicles present in Downtown Frederick (where most City employees work).

Actions:

1. Needs assessment for each department/building

   Mid-term **Agency**: *(INSERT APPROPRIATE AGENCY)*

   The assessment should determine how many bikes per building, based on trips made out of building, the length of trips in miles, and the number of employees in each building,

2. Locate spaces for bikes at buildings where bikes will be located

   Mid-term **Agency**: *(INSERT APPROPRIATE AGENCY)*

   Parking should discuss with Planning on this action.

3. Identify funding for bike fleet

   Short-term **Agency**: *(INSERT APPROPRIATE AGENCY)*

2 Goal: Reduce automobile dependency among city residents.

Why?

ECONOMY

Driving is an expensive proposition for both car owners and the city as a whole.

ENVIRONMENT

Decreases in vehicle-miles traveled (VMT) by all residents (in addition to City employees on official business) result in fewer emissions and improved air quality.

EQUITY

Not everyone in Frederick can necessarily afford the cost of owning and driving a car. However, having a car is a near-necessity in Frederick.

Potential Challenges with Goal 2:

Bikeshare stations must be located at a certain density in order to create successful program and network, yet also maintain a certain amount of coverage within the city in order to be effective. Improperly balancing these objectives may lead to diminished success for a bikeshare network.

Businesses may object to the elimination of the free holiday parking and the "Park and Shop" program if they fear that increased parking prices might drive away business.

Although the City and TransIT have a good working relationship, the City's representatives on TransIT's Transportation Services Advisory Council are ex-officio members and have no formal say over the system's funding and planning process.

Most carshare programs do not allow "one way" trips (a car must be returned to the same location where the trip began), residential areas of the city may not have the densities required to successfully support carshare, especially if it uses the "round trip" model. Also, Frederick is fairly compact and once people are there, they may not need a car to travel further around downtown.

Zipcar formerly located two vehicles on the campus of Hood College. Their removal may indicate that the demand required to support carshare in Frederick does not exist.

Objective 1:
Increase bicycling among residents by (percentage) by (year).

There is a correlation between the installation of bicycle infrastructure and an increase in the number of cyclists. This suggests that people will ride bicycles if they feel safe doing so. Bicycles have no emissions and not only provide a means of travel, but exercise and recreation as well.

Actions:

1. Continue to maintain goal of constructing five miles of shared-use bike paths each year

   Ongoing — ***Agency**: (INSERT APPROPRIATE AGENCY)*

2. Continue to require construction of bike paths within ½ mile of all residential development

   Ongoing — ***Agency**: (INSERT APPROPRIATE AGENCY)*

3. Construct bicycle cages in city parking decks to provide secure place for bicycle parking that is not exposed to the elements

   Mid-term — ***Agency**: (INSERT APPROPRIATE AGENCY)*

   Parking should work with Transportation to determine how many cages should be built the parking decks

4. Expand Capital Bikeshare to serve City of Frederick. Stations should be strategically located in areas with existing and/or planned bike infrastructure and to fill in gaps in the public transit network

   Mid-term — ***Agency**: (INSERT APPROPRIATE AGENCY)*

5. Continue to take part in the region wide "Bike to Work Day"

   Short-term — ***Agency**: (INSERT APPROPRIATE AGENCY)*

   Transportation should work with Parking, MWCOG, and Washington Area Bicyclist Association for implementation.

2 Goal: Reduce automobile dependency among city residents.

Objective 2:

Reduce public parking incentives – both direct and indirect, by (percentage) during the next fiscal year cycle.

Parking lots and garages take up valuable space, especially in built up areas such as downtown Frederick, and cost a significant amount of money to build and maintain. In addition, they are constructed using impervious surfaces that create large amounts of runoff and other negative impacts on the environment. Finally, the construction of more parking can induce more driving to reach downtown. Most building codes require far more parking than is needed and a reduction in available parking supply will rarely have negative impacts on drivers looking to park.

Actions:

1. Eliminate all free parking programs by FY2017

   Short-term **Agency**: (INSERT APPROPRIATE AGENCY)

   Including: free parking on weekends between Thanksgiving and Christmas, the "Park and Shop" program, and the "Parking Courtesy Program".

2. Work with event organizers to promote alternate modes of transportation or parking options

   Short-term **Agency**: (INSERT APPROPRIATE AGENCY)

Objective 3:

Increase public transit use across City to an annual ridership of (number) passengers by (year).

The local public bus system, TransIT, is owned and operated by the Frederick County, even though most of the routes and ridership are located within the City of Frederick limits. Access and mobility are limited to those without cars in Frederick, therefore it is important that the city retain its influence over the planning processes for the local bus system in order to create and maintain accessibility and mobility for those in the community who would otherwise be unable to get around the city.

Actions:

1. Continue to maintain relationship with the Frederick County Transportation Department and TransIT

   Ongoing **Agency**: (INSERT APPROPRIATE AGENCY)

2. Encourage the County into expanding the existing bus system by adding new service areas, additional frequencies, and expanded spans of service where the potential for additional ridership exists in order to achieve higher ridership goal

   Mid-term **Agency**: (INSERT APPROPRIATE AGENCY)

3. Continue to support and contribute funding to the purchase of electric bus fleet, which will decrease fleet emissions

   Ongoing **Agency**: (INSERT APPROPRIATE AGENCY)

Objective 4:

Increase (percentage) of connectivity to downtown through City circulator by (year).

Implement a "circulator" shuttle bus service within the downtown area in order to reduce the need to drive within downtown and to reduce or shift the parking demand as needed within this area. It would take anywhere from two to five years to launch a circulator service from the time the service concept is approved by the Board of Aldermen and mayor.

Actions:

1 Identify boundary of circulator

Short-term **Agency**: (INSERT APPROPRIATE AGENCY)

Transportation should work with parking to determine best parking schedules and structures as well as outer points of interest for potential connection such as Harry Grove Stadium

2 Identify major hubs or points of interest inside the downtown Frederick area that would be connect other hubs within the downtown area

Short-term **Agency**: (INSERT APPROPRIATE AGENCY)

Transportation should work with Planning and the Downtown Frederick Partnership to determine needs of each hub; potential sites: city parking decks, Shab Row, the transit center, City Hall, Frederick Memorial Hospital, Hood College, Memorial Park, Baker Park, and Market Street

3 Identify storage area for circulator vehicles

Short-term **Agency**: (INSERT APPROPRIATE AGENCY)

Transportation should work with Planning

4 Draft maintenance and capital expenditures plan for circulator

Short-term **Agency**: (INSERT APPROPRIATE AGENCY)

5 Identify funding source

Short-term **Agency**: (INSERT APPROPRIATE AGENCY)

2 Goal: Reduce automobile dependency among City residents.

Objective 5:

Launch car share program by (year).

A carshare program provides vehicles at designated locations for short-term rental, often by the hour, for people who do not own a car or who need a car other than the one they own for a specific task (such as a pickup truck). Research shows that carshare program members tend to own fewer or no personal vehicles, drive fewer miles, and "shed" fuel inefficient vehicles.

Actions:

1. Using Census data, determine cars per household in Census tracts to find car needs among area residents

   Short-term **Agency**: (INSERT APPROPRIATE AGENCY)

   Code Enforcement should work with Permitting Department, Street Lighting & Traffic Control Department

2. Identify parking spaces that can be leased out to carshare

   Short-term **Agency**: (INSERT APPROPRIATE AGENCY)

   Code Enforcement should work with Permitting Department, Street Lighting & Traffic Control Department

3 Goal: Encourage sustainable policies, regulations, and laws at the City and County level.

Why?

ECONOMY

Sustainable policies and regulations in transportation decrease costly spending for public infrastructure and maintenance costs for city projects. These laws also have the potential to increase tax revenue from commercial properties when allowed to increase density.

ENVIRONMENT

Decreasing car usage and vehicle miles traveled (VMT) along with switching to alternative fleet options reduce emissions.

EQUITY

Incentivizing public transportation speed and options extending outside of the city allows for those who cannot afford to live in the city or choose to take public transit.

Objective 1:

100 percent City departments and agencies to practice idling regulations unless otherwise noted by 2016.

The greatest density of emissions from automobiles happens during the first few minutes of a trip due to "cold starting" and while idling. A policy banning idling, which also falls in line with Maryland State Law, will decrease cost of wasted fuel and decrease environmental emissions.

Actions:

1. Draft a resolution formally adding idling regulations to City policy

   Immediate **Agency**: *(INSERT APPROPRIATE AGENCY)*

   - *Consult with Public Works to determine fleet idling needs.*
   - *Refer to Analysis of this chapter for information about Maryland State law and case studies.*

2. Pass resolution into local law

   Short-term **Agency**: *(INSERT APPROPRIATE AGENCY)*

   If necessary, two to three sentences about money, obstacles, regulations, and suggested benchmarks.

Objective 2:

All future long-range, sector/small, and comprehensive plans to include sustainability components in transportation.

When alternatives to the car are faster at peak hours than the car, people utilize those alternatives. When there are more people using transit there are less cars on the road, less maintenance costs for roads, less congestion for other drivers, and less pollutants in the air.

Actions:

1. Draft a resolution formally adding idling regulations to City policy

   Ongoing **Agency**: *(INSERT APPROPRIATE AGENCY)*

   - *Plans should not necessarily identify "sustainability" as a purpose for a choice, but rather the more sustainable choice should be made when making plans.*
   - *Refer to Analysis of this chapter for information about integrating sustainability into plans.*

3 Goal: Encourage sustainable policies, regulations, and laws at the city and county level.

Objective 3:

Advocate at county level for adoption of "bus on shoulder" on highways during peak hours (year).

When alternatives to the car are faster at peak hours than the car, people utilize those alternatives. When there are more people using transit there are less cars on the road, less maintenance costs for roads, less congestion for other drivers, and less pollutants in the air.

Actions:

1. Draft resolution advocating county TransIT to write into law

   Short-term **Agency**: *(INSERT APPROPRIATE AGENCY)*

   Refer to Analysis of this chapter for case studies and scholarly articles encouraging this practice

2. Pass resolution advocating for "bus on shoulder"

   Short-term **Agency**: *(INSERT APPROPRIATE AGENCY)*

3. Write into sector plans and master plans, where appropriate and under jurisdiction of City, that buses may use shoulder during peak hours.

   Ongoing **Agency**: *(INSERT APPROPRIATE AGENCY)*

4. Make a priority during TransIT committee meetings

   Immediate **Agency**: *(INSERT APPROPRIATE AGENCY)*

Objective 4:

75 percent of all City vehicles to be green or use alternative fuels by (year).

By moving to a green fleet, the city can save money on fuel and maintenance costs associated with traditional gasoline vehicles. They can also reduce emissions.

Actions:

1. Collect data on VMT and fuel efficiency for each vehicle

   Mid-term **Agency**: *(INSERT APPROPRIATE AGENCY)*

2. Identify those vehicles with easiest green alternatives

   Short-term **Agency**: *(INSERT APPROPRIATE AGENCY)*

3. Perform cost/benefit analysis comparing retrofitting of cars versus selling old fleet and purchasing green fleet

   Mid-term **Agency**: *(INSERT APPROPRIATE AGENCY)*

   - *Transportation should consult with City Administration to determine possible funding stream for and cost of purchasing new fleet.*
   - *Refer to Analysis of this chapter for case studies on green city fleet implementation.*

Objective 5:

75 percent of local streets within City boundaries to become "complete streets" by 2035.

Complete Streets allow for healthier and more aesthetically pleasing neighborhoods in which residents can utilize various transit modes, enjoy green space, and gather or access amenities safely.

Actions:

1. Continue policy requirement for developers to road connectivity where there is already multi-modal access.

   Ongoing **Agency**: *(INSERT APPROPRIATE AGENCY)*

2. Each new sector plan or master plan should include complete streets in every possible instance on roads within the City's jurisdiction

   Ongoing **Agency**: *(INSERT APPROPRIATE AGENCY)*

3. City should advocate at County level for new plans adjacent to City boundaries include complete street components

   Ongoing **Agency**: *(INSERT APPROPRIATE AGENCY)*

4. Identify grants and funding sources in the City budget to accomplish progress in a timely manner

   Ongoing **Agency**: *(INSERT APPROPRIATE AGENCY)*

   Refer to Analysis of this chapter for potential grants

3 Goal: Encourage sustainable policies, regulations, and laws at the city and county level.

Objective 6:

Advocate at county level to change zoning obstacles that disincentivize sustainable practices for multi-modal transportation and limited required

Certain laws, practices, and zoning code at the City and County levels make sustainability a last resort when developers develop pro-forma, and administrations/agencies develop budgets. It is imperative that particular laws be changed to meet the needs of a sustainable future.

Actions:

1. Draft resolution for Board of Aldermen to endorse zoning rewrite that underground parking structures need not be included in total Floor Area Ratio

   Short-term **Agency**: *(INSERT APPROPRIATE AGENCY)*

   Refer to Analysis of this chapter for case studies on this zoning rewrite option

2. Research Parking Districts

   Ongoing **Agency**: *(INSERT APPROPRIATE AGENCY)*

   Refer to Analysis of this chapter for case studies on parking districts

3. Tiered minimum and maximum parking restrictions for developers based on proximity to public transportation options

   Ongoing **Agency**: *(INSERT APPROPRIATE AGENCY)*

   Refer to Analysis of this chapter for case studies on minimum and maximum parking restrictions

TRANSPORTATION ANALYSIS

The following pages are in-depth analyses of each goal and objective - detailing case studies, best practices, and implementation methods. It is meant to be supplementary material that can guide Frederick.

GOAL ONE | OBJECTIVE ONE - FOUR:

1) 50 percent of multi-family units to implement green retrofit or rehabilitation program by 2025
2) Non-automotive commute incentive available to (percentage) of City employees by (year).

Goal Summary

Frederick's policy with regards to City employee transportation mode choice should be threefold: it should require trips that are able to be made by non-automobile means with no detriment to the trip's function to be done so by non-automobile means; it should incentivize use of non-automobile means for trips conducted on City business, and it should ensure that City employees have the ability to choose a non-automobile travel mode for trips on City business whenever possible.

GOAL ONE:

Maximize City employee use of non-automobile transportation.

O-1:
The majority of fixed-location City employees work in Downtown Frederick. These offices are in close proximity to each other; City Hall, the Municipal Annex, the Parking Department, the Police Department, and the Frederick Community Action Agency are all within a half-mile's walk of each other (see map). Trips between these facilities, or to many other locations within Downtown Frederick, could be more efficiently made on foot than in an automobile.

This policy would reduce vehicle ownership, maintenance, and fuel costs, as well as the need for parking and the impacts of short trips on traffic congestion in Downtown Frederick. In addition, requiring these trips to be made on foot will encourage fitness and wellness among City employees.

O-2:
Provision of free parking for City employees costs the City of Frederick as foregone revenue from paying customers. This program amounts to a subsidy for driving to work, as those who do not drive and therefore do not utilize the space to which they are entitled do not receive any compensation for not using that space. In light of the many benefits—congestion-related and environment-related—of public transportation usage, the City should permit those employees who do not wish to use their allocated parking space to receive in cash the value of that benefit. The proposed voluntary program is cost neutral yet could bring substantial benefits.

The City of Austin offers this benefit, calling it a "parking cash-out program." Each employee is issued a parking stipend for a downtown garage, and has the option of releasing it or purchasing a parking space with it. Austin's goal is a 20 percent reduction in employee usage of single-occupancy-vehicles for their commutes (City of Austin 2014).

The State of Rhode Island offers a different type of parking cash-out. Rather than offering cash compensation, the state requires even private employers located within ¼ mile of public transportation who provide free parking to employees to provide the option of receiving a free public transportation pass in lieu of free parking (Commuter Resource RI n.d.). While this program does not incentivize walking or bicycling, it would boost ridership of public transport and reduce congestion.

O-3:
A City fleet of bicycles could extend the range of non-automobile transport for City employees from a half-mile to trips of two to three miles. Implementation of a bicycle fleet would reduce the costs of the City's vehicle fleet, as well as encourage fitness and wellness among City employees. Several cities across the United States have implemented this policy. Most notable among them is San Francisco. That city's CityCycle program places a fleet of nearly 50 bicycles at 23 locations throughout the City for use by employees on City business. The program also includes educational materials to train City employees on urban bicycling skills as well as a maintenance plan that distributes maintenance responsibilities among City employees (San Francisco Department of the Environment (SF Environment) n.d.). Tuc-

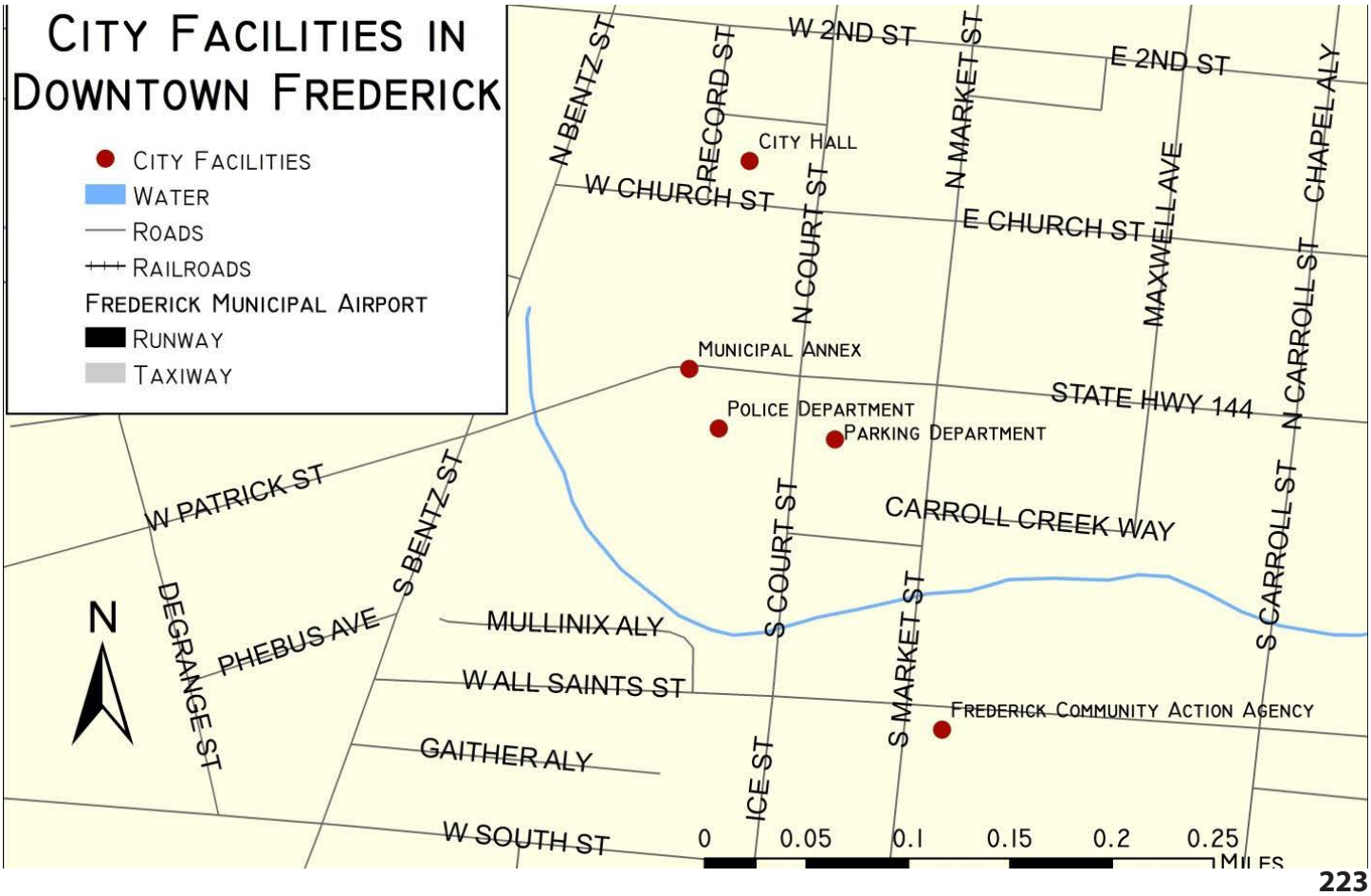
3) City fleet of bicycles available to (percentage) of employees by (year).
4) (Percentage) of fixed-location workers telecommuting once per week by (year).

son, Arizona offers a similar program, which is limited to the city's downtown area, but permits employees to check out bicycles for wellness rides in addition to trips on City business (City of Tuscon n.d.).

O-4:
Telecommuting reduces traffic, spent, and time spent commuting, and—contrary to popular belief—has been shown to increase productivity. An effective telecommuting policy balances the need for in-person meetings and work sessions with an employee's agreement to provide a suitable workplace at another location. Different departments and employees may have different levels of need for in-person work; an employee who conducts maintenance work on City facilities would need to travel to that facility to conduct the work, while an employee who analyzes data for City programs may rarely need to travel to a given office. Therefore, telecommuting policies should be developed at the departmental level.

The City of St. Paul, Minnesota, has a detailed telecommuting policy with the following key provisions: telecommuting is mutually agreed upon by an employee and his or her supervisor, is contingent on continuing the same level of work responsibilities and hours, and is subject to at-home site visits from supervisors if necessary. The policy recognizes that telecommuting creates challenges for information security, but trusts that employees who telecommute will take appropriate precautions.

Despite the challenges with telecommuting, it has the potential to reduce the traffic impacts and parking requirements of employee commutes, can create additional flexibility in the event of a snow emergency, and tends to reduce the stress and worry of commuting. These effects mean that telecommuting can be a "win-win" for employees and the City if a well-developed telecommuting policy is implemented.



GOAL TWO | OBJECTIVE ONE - TWO:

1) Increase bicycling among residents by (percentage) by (year).
2) Reduce public parking incentives – both direct and indirect, by (percentage) during the next fiscal year cycle.

GOAL SUMMARY

Getting to and around Frederick is most easily accomplished with a car. The downtown area has over 4,200 parking spaces (both on-street and in City-owned garages), with an additional parking deck with over 200 more spaces to be constructed in the next few years (Walker Parking Consultants 2015). On the Golden Mile, another major commercial strip within Frederick, every shopping center is flanked by a large parking lot. Frederick does have some bicycle infrastructure and a public bus system, but most people appear to rely on cars for their daily travel needs and census data backs this hypothesis (U.S. Census Bureau 2013). However, by improving and investing in alternative modes of transportation, such as public transportation, bicycling, and carshare, the City can provide means of transportation to those who do not wish to or cannot afford to rely on an automobile, and also provide the opportunity to those who can use a car regularly the option to use less polluting forms of transportation.

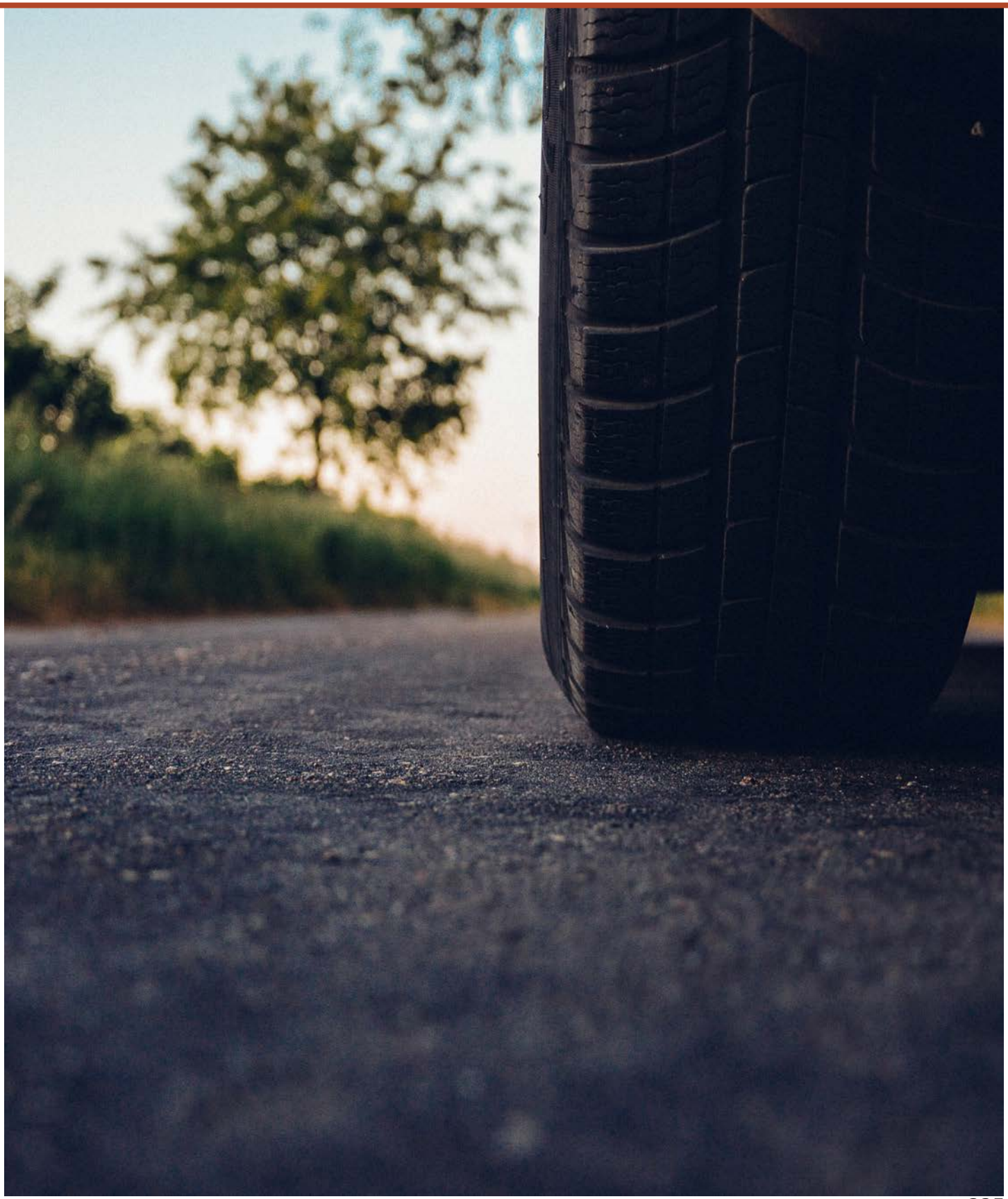
GOAL TWO:

Reduce automobile dependency among city residents.

O-1:
There is a correlation between the presence of bicycle infrastructure and an increase in the number of cyclists (Hankey, et al. 2012). It is difficult to quantify exactly how many bicycles are in use in any city as they are often not included in traffic counts. However, researchers in Los Angeles found a correlation between the presence of bike infrastructure (such as paved paths or marked bike lanes) and an increase in bicycle riding (Stinson, et al. 2014). This suggests that people are more likely to consider riding a bike rather than driving if they feel they will be safe while doing so. To achieve this objective, the City should continue to expand the paved bike path network and require developers to construct sidewalks and other bicycle-friendly infrastructure. In addition, bike cages to provide secure bicycle storage should be constructed in the downtown parking garages, like the one installed at the College Park Metrorail Station near Washington, DC.

Establishing a bikeshare program would also increase bicycling in the city, as it would make bicycles available to those who do not necessarily have one and provides a place at which to return them easily. Capital Bikeshare, which is based in Washington, DC, has expanded to neighboring jurisdictions, and it is likely that there are Frederick residents who are members of the program so they can use it when they are in DC. However, in order for bikeshare to be successful, the capital investment must be made to ensure that stations are spaced close enough together that they are well utilized or else the program may not be successful (Schmitt 2015).

O-2:
Free parking or plentiful parking supply induces more driving which in turn creates an even higher demand for additional parking spaces (Shoup 2011). In addition, only 1 percent of car trips in the United States ending at a location other than one's own home end at a location where parking is not available for free (Shoup 2011). Frederick already has nearly 2,500 off-street parking spaces in the downtown area and 85 percent of these are occupied on weekdays, which indicates a facility operating at or near practical capacity within the planning industry (Walker Parking Consultants 2015). The City has proposed the construction of an additional new parking garage to accommodate future demand, but research shows that this will likely just increase driving in downtown Frederick further. Drivers looking for parking drive slowly as they search for spaces, which creates congestion on city streets, and increase vehicle-miles traveled by looking for the parking space closest to their destination even if other spaces are slightly further away (Shoup 2011). By offering programs such as the free parking on weekends between Thanksgiving and Christmas, the "Park and Shop" program, and the "Parking Courtesy Program, the City encourages even more people to drive. The parking situation and the proposal to construct even more parking is not sustainable in the long term as additional miles-driven by city residents will create more traffic congestion and environmental degradation from vehicle emissions. Eliminating free parking programs will encourage residents to consider coming downtown by methods other than their cars.



GOAL TWO | OBJECTIVE THREE - FIVE:

3) Increase public transit use across city to an annual ridership of (number) passengers by (year).

4) Increase (percentage) of connectivity to downtown through City circulator by (year).

GOAL SUMMARY

Getting to and around Frederick is most easily accomplished with a car. The downtown area has over 4,200 parking spaces (both on-street and in City-owned garages), with an additional parking deck with over 200 more spaces to be constructed in the next few years (Walker Parking Consultants 2015). On the Golden Mile, another major commercial strip within Frederick, every shopping center is flanked by a large parking lot. Frederick does have some bicycle infrastructure and a public bus system, but most people appear to rely on cars for their daily travel needs and census data backs this hypothesis (U.S. Census Bureau 2013). However, by improving and investing in alternative modes of transportation, such as public transportation, bicycling, and carshare, the City can provide means of transportation to those who do not wish to or cannot afford to rely on an automobile, and also provide the opportunity to those who can use a car regularly the option to use less polluting forms of transportation.

GOAL TWO:

Reduce automobile dependency among city residents.

O-3:
Management of the public transportation system in Frederick is not directly in the City's control. TransIT, the local bus operator, is part of the Frederick County Department of Transportation. The City has representatives on TransIT's Transportation Services Advisory Council, but they are ex-officio members and have no formal say over the system's funding and planning process. However, despite only having an indirect role in the planning process, the City can and should encourage the implementation of transit planning principles that have led to ridership increases in other places.

The City and County should work together to identify areas that are likely to generate additional ridership if service is increased from current levels or new service is established. Currently, TransIT operates hourly service Mondays through Saturdays, with half-hourly service on selected routes during rush hour. Adding Sunday service would provide mobility to those who do not have other means of transportation available to them every day of the week, and offer an option for traveling around the city besides driving. Adding more frequent service to times when there is already bus service will make the bus more attractive for those who otherwise would not use it; potential passengers may be concerned that with hourly headways, they will find themselves waiting for the bus for so long it would be easier to drive instead. Some routes operate as loops that make lengthy trips for some passengers in at least one direction and it may be possible to straighten out these routes to make them more efficient and decrease travel times. Other strategies can be considered as appropriate, under the premise that if transit services are made more attractive to "choice commuters" (those who could drive or use other means to get to work but choose to use public transit), they will use the service, drive less, reduce their vehicle emissions, and travel around Frederick in a more sustainable manner.

O-4:
A "circulator" shuttle bus service within the downtown area in order to reduce the need to drive within downtown and to reduce or shift the parking demand as needed within this area. The creation of a circulator also is useful in achieving other transportation sustainability goals in this report. Circulator services have been successful in many places, including Bethesda, MD and Annapolis, MD, and a Frederick circulator modeled after one of these "case study systems" is likely to succeed as well. It would take anywhere from two to five years to launch a circulator service from the time the service concept is approved by the Board of Aldermen and mayor, but the potential benefits of this project are such that implementation as soon as possible is ideal (Davis 2015).

In Bethesda, the circulator went from being fully funded by the county government to being funded by the Bethesda Parking District and the Bethesda Urban Partnership within five years of its launch (Metropolitan Washington Council of Governments 2008). It allows people coming to Bethesda to park at one location and use the circulator to reach their destination if it is not within walking distance, as well as a way for people who arrive in Bethesda by public transit to reach their final destinations with less walking. In the case of Frederick, it would enable people to park further from their final destinations without needing to walk the rest of the distance, and enable people who are already downtown to go other places within

5) Launch car share program by (year).

"investing in alternative modes of transportationcan provide means of transportation to those who do not wish to or cannot afford to rely on an automobile"

downtown without needing to walk or drive.

The City already has a partner who could operate this service, TransIT, which operates the county bus system. While the City may have to initially fund the service, revenues from the Parking Department could possibly be used for funding the circulator. Over time, it may be that businesses, through the Downtown Frederick Partnership, begin to fund some or all of the service, in which case the City can explore the feasibility of a similar circulator service for the Golden Mile Corridor.

O-5:
A carshare program provides vehicles at designated locations for short-term rental, often by the hour. There are several circumstances under which someone might want or need a carshare vehicle. Some people only have occasional use for a car and prefer to rent one for the occasions they need it, rather than owning one. Other people may own a car but use carshare when they need a vehicle for a specific purpose, such as a pickup truck to move a large load across town. Carshare programs have the potential to reduce car ownership; research estimates that about nine cars are removed from the road for every carshare vehicle in North America and that carshare vehicles, on average, are 10 MPG more efficient than the personal vehicles they replace (Martin, Shaheen and Lidicker 2010).

Frederick had carshare vehicles available on the Hood College campus for a time, but that program has since been discontinued (Miot 2010). However, students at Hood College are a good target audience for carsharing, and would help to reduce the number of cars brought to campus and driven throughout the City. That being said, there are some significant hurdles that a carshare program in Frederick would have to overcome in order to be successful. Many carshare programs, such as Zipcar, require a car to be returned to where it is initially rented, which allows potential users the ability to users to made advance reservations and have guaranteed parking at the end of a trip (Institute for Transportation & Development Policy 2014). However, offering one way rentals that end within a designated zone can lead to an imbalance of vehicles and no vehicle being close to where a potential user is when he or she is ready to start a trip (Institute for Transportation & Development Policy 2014).

GOAL THREE | OBJECTIVE ONE - TWO:

1) 100 percent city departments and agencies to practice idling regulations unless otherwise noted by 2016.

TEMPLATES FOR CITY-WIDE LAWS OR POLICIES FROM OTHER CITIES FOR IDLING VEHICLES:

Minneapolis's Anti-Idling Vehicle Ordinance: http://www.ci.minneapolis.mn.us/environment/air/airquality_antiidling_home

Salt Lake City's Idle Free Ordinance: http://www.slcgov.com/idlefree/ordinance

American Transportation Research Institute's Compendium of Idling Regulations: http://www.atri-online.org/research/idling/ATRI_Idling_Compendium.

GOAL THREE:

Encourage sustainable policies, regulations, and laws at the City and County level.

A majority of transit ridership of Frederick County's TransIT system is generated by the City of Frederick residents. Because of this fact, the City has sway with regards to transportation policies and laws made at the county level. By openly advocating for particular changes in regulation and statute, the City can create a more sustainable transportation environment that will enhance and strengthen business districts, decrease air pollution, and increase access to quality amenities and jobs for residents that depend on the city's economy. All of the objectives mentioned under this goal allow for savings, better air quality, and healthier communities. It is important for staff to support and inform the Aldermen such that they can pass solid resolutions encouraging, supporting, and endorsing sustainable changes to regulations, policies, and zoning laws at both the City and County levels.

O-1:
It is sometimes said that restarting a vehicle creates more emissions than idling. This is only true when the engine is cold and turned on for the first time, coined the "Cold Start" (Federal Highway Administration 2015). This is because the engine operates most efficiently at higher temperatures; it can take a few minutes or even a few miles to get the engine to this efficient temperature. However, once it has reached the temperature threshold the car emits densest pollutants during idling (Gaines, Rask and Keller 2013).

Maryland State "Idling Law (Transportation Article §22-402), [states]

A motor vehicle engine may not be allowed to operate more than 5 consecutive minutes when the vehicle is not in motion, except as follows:

• When a vehicle is forced to remain motionless because of traffic conditions or mechanical difficulties over which the operator has no control;

• When it is necessary to operate heating and cooling or auxiliary equipment installed on the vehicle;

• To bring the vehicle to the manufacturer's recommended operating temperature; or

• When it is necessary to accomplish the intended use of the vehicle" (Maryland Department of the Environment 2010).

While it is already the law in the State, to ensure that residents and City employees both know and abide by the law, the City should make formal policies regarding idling of vehicles. Cities all around the country are taking idling seriously (Sustainable America 2013)as it increases emissions particularly in areas with high densities of people and traffic lights.

O-2:
Forward planning without sustainability in mind can create obstacles to future efforts. For example: currently electric charging infrastructure is being built in Frederick to accommodate an all-electric bus fleet for TransIT. That infrastructure will not be able to handle an extra two to three buses that the City can utilize for the planned city circulator, thus requiring the circulator to be hybrid diesel rather than 100 percent electric. Researchers at the University of Florida

assert that integrating sustainability into comprehensive plans is the next logical step in city progress and growth, "Sustainability is not contradictory to growth, profit, and development. Sustainability means that we plan to our limits; sustainable community development draws from and gives back to local strengths, resources, and uniqueness" (Gellermann, et al. 2014)

The American Planning Association has identified two different ways in which a city can begin including sustainability into comprehensive plans. The first is to simply add a section about sustainability in the comprehensive plan, while also:

• "Provide an overview of the issue, the rationale for addressing sustainability in the plan, and the relationship to other elements of the plan. Also include a definition of what sustainability means to your community…

• Summarize existing conditions and any baseline assessments. For example, if your community has completed a greenhouse gas inventory or an assessment of energy use, those could be summarized here as background information.

• Establish sustainability goals and then develop policies to support those goals. Consider connections to land use, transportation, infrastructure, and other important aspects of the plan.

• Create implementation or action steps to achieve the sustainability goals, identifying who will lead the implementation, what the timelines will be, and any known resources or funding sources that could help with the implementation. You may also include metrics to assess and track your progress toward your sustainability goals" (Rynne 2011)

The second is to deliberately address "aspects of sustainability by incorporating sustainability goals and policies throughout the existing [comprehensive] plan elements, such as land use, transportation, and housing" (Rynne 2011).

Other components of the transportation section of a comprehensive plan should also include the following sustainable transportation infrastructure plans:

Approve a Bicycle/ Pedestrian Plan:

The City is working on a Bicycle Pedestrian Master Plan that will recommend improvements, offer a prioritization strategy, and maintenance guidelines for effective bicycle and pedestrian infrastructure.

Establish a Shared Use Path Siting Goal:

The City would like to establish a goal for all residential developments to be located within ½ mile of a shared use path.

Establish a Shared Use Path Installation Goal:

The City would like to set a goal to create five miles of Shared Use Path each year and would require a Capital Improvement Plan (CIP) be established to do so.

Explore the possibility of electric vehicle charging stations throughout the city. As the demand for electric vehicles grows, the demand for spaces to charge them also will grow. City staff will establish a prioritization plant to explore locations where charging stations might be installed and determine how the stations might be funded and maintained. Revisions to the Land Management Code will be required and incentives may be included. Most building codes have been revised to accommodate charging stations, but a review of those codes is needed to confirm ease of development and predictability.

GOAL THREE | OBJECTIVE THREE - SIX:

3) Advocate at county level for adoption of "bus on shoulder" on highways during peak hours (year).
4) 75 percent of all City vehicles to be green or use alternative fuels by 2016.

BUS ON SHOULDER (BOS) PROGRAMS AND TOOLKITS:

01 Durham-Raleigh region, http://www.triangletransit.org/bus-shoulder-system

02 I-66 Bus-on-Shoulder Pilot Program, http://www.virginiadot.org/projects/northernvirginia/66_bos.asp

03 The Transit Cooperative Reserve Program (sponsored by the Federal Transit Administration) created a toolkit for the successful implementation of BOS programs, called "A Guide for Implementing Bus On Shoulder (BOS) System": http://onlinepubs.trb.org/onlinepubs/tcrp/tcrp_rpt_151.pdf

GOAL THREE:

Encourage sustainable policies, regulations, and laws at the City and County level.

When alternatives to the car are faster at peak hours than the car, people utilize those alternatives. When there are more people using transit there are less cars on the road, less maintenance costs for roads, less congestion for other drivers, and less pollutants in the air. A way to ensure that available public transit is faster than cars during peak hours is the implementation of Bus On Shoulder programs.

The Bus On Shoulder (BOS) operation allows authorized transit buses with trained drivers to operate on the shoulders of selected freeways at low speeds during periods of congestion in order to bypass congested traffic and maintain transit schedules. The BOS operation is a low-cost treatment that can provide immediate benefits to transit whenever travel is experiencing moderate to heavy degrees of congestion. BOS is being studied as a pilot program on I-270 from the Montgomery County Line to Maryland Route 85. The MTA, State Highway Administration (SHA), and Maryland State Police will be needed for the program to be successful. This is an achievable goal to increase ridership and to help reduce congestion in the corridor.

There are numerous states (Florida, North Carolina, Georgia, New Jersey, Delaware, Maryland, Virginia, Ohio, Minnesota, Illinois, Kansas, California, Washington) that have BOS programs.

O-4:
By moving to a green fleet, the city can save money on fuel and maintenance costs associated with traditional gasoline vehicles while also reducing emissions. City fleet can be improved with Maryland Energy Administration and other grant funds. As City vehicles are retired, some will be replaced with hybrid and electric vehicles as funding and resources permit. Over time, the fleet will be more fuel-efficient, saving the City in fuel costs and reducing its carbon footprint. The State is exploring a 20 percent purchase rate of zero-emission vehicles (ZEV) by 2025.

Cities all over the country are moving their fleets from traditional gasoline fuel to hybrid, alternative fuels, or 100 percent electric. A contest was created in 2000 to highlight and honor those cities that green their fleets called, "100 Best Fleets." This past year the City of Kansas City, Missouri won first place out of over 60 cities nationwide for the Green Fleet Award (100 Best Fleets 2014). Appendix E.1. gives the evaluation standards for the award (100 Best Fleets 2008).

There are many options to reduce emissions. In California, "San José is leading by example by developing a 'Green Fleet' policy to guide the transformation of the City's fleet. The City has implemented the use bio-diesel fuels with the existing fleet and has made positive strides towards acquiring green vehicles while providing support for alternatively fueled vehicles throughout the entire fleet inventory. Work is currently underway to expand the inventory of public EV plug-in stations and access to alternative fueling depots including Compressed Natural Gas" (City of San Jose 2012). The U.S. Department of Energy highlights various ways to shift to a green fleet as well as ways to pay for the program. Both Ohio and Illinois are highlighted for the policies and implementation of programs in both small and large towns (U.S. Department of Energy 2013).

O-5:
Adopt a Complete Streets Policy: Complete streets are streets for everyone. They are designed and operated to enable safe access for all users, including pedestrians, bicyclists, motorists and

5) 75 percent of local streets within City boundaries to become "complete streets" by 2035.
6) Advocate at county level to change zoning obstacles that disincentivize sustainable practices for multi-modal transportation and limited required parking by (year).

transit riders of all ages and abilities. Complete Streets make it easy to cross the street, walk to shops, and bicycle to work. They allow buses to run on time and make it safer for people to walk to and from train stations. Creating Complete Streets means transportation agencies must change their approach to community roads. By adopting a Complete Streets policy, communities direct their transportation planners and engineers to routinely design and operate the entire right of way to enable safe access for all users, regardless of age, ability, or mode of transportation. This means that every transportation project will make the street network better and safer for drivers, transit users, pedestrians, and bicyclists—making your town a better place to live.

For "The Best Complete Streets Policies of 2012," a great resource for implementing complete streets policy at the city level, utilize the report by Smart Growth America: http://www.smartgrowthamerica.org/complete-streets-2012-analysis.

O-6:
Some zoning works against sustainability. Most widely cited are parking requirements based on the usage of a building and its square footage. Frederick has already made strides toward reducing those requirements. However, there are other opportunities that Frederick can be working toward that can increase land utility while decreasing parking issues and traffic in the city.

Explore the reallocation of sidewalk space and parking in specific downtown locations. This would allow for wider sidewalks in the busiest part of the downtown area. It would provide a greatly improved pedestrian experience and allow for a better sidewalk café program and better pedestrian connectivity between three parking decks, Carroll Creek Park, C. Burr Artz Public Library, Weinberg Center, and the County Court House.

Currently, Frederick County zoning code includes underground parking structures in the overall Floor Area Ratio (FAR) of a building. This disincentivizes underground parking and incentivizes poor land use and urban design. Washington, DC, for example, doesn't include underground parking structures in the FAR calculations for new developments, thus increasing the likelihood that developers will invest in underground parking structures in an effort to increase their building density. This allows for better use of the interior of the building structure and more tax revenue due to increased usage of the space.

GOALS, OBJECTIVES AND ACTIONS SUMMARY TABLE

Goal 1: Maximize City employee use of non-automobile transportation	
Objective 1: (Percentage) of trips on City business of less than a half-mile are required to be made on foot, unless vehicle is required, by (yea	
1.1.1	Create buffer maps surrounding each City department of ½ mile showing 'walkable' distances
Objective 2 : Non-automotive commute incentive available to (percentage) of City employees by (year).	
1.2.1	Determine cost assumed by City for free parking
1.2.2	Identify funding in budget for at least 25% of employees to receive value of parking benefit
1.2.3	Write summary of benefit programs for Administrative approval
Objective 3 : City fleet of bicycles available to (percentage) of employees by (year).	
1.3.1	Needs assessment for each department/building
1.3.2	Locate spaces for bikes at buildings where bikes will be located
1.3.3	Identify funding for bike fleet, and plan for maintenance.
Objective 4: (Percentage) of fixed-location workers telecommuting once per week by (year).	
1.4.1	Needs assessment for each department/building
1.4.2	Locate spaces for bikes at buildings where bikes will be located
1.4.3	Identify funding for bike fleet
Goal 2: Reduce automobile dependency among City residents.	
Objective 1: Increase bicycling among residents by (percentage) by (year).	
2.1.1	Continue to maintain goal of constructing five miles of shared-use bike paths each year
2.1.2	Continue to require construction of bike paths within ½ mile of all residential development
2.1.3	Construct bicycle cages in city parking decks to provide secure place for bicycle parking that is not exposed to the elements
2.1.4	Expand Capital Bikeshare to serve City of Frederick.
2.1.5	Continue to take part in the region wide "Bike to Work Day"
Objective 2: Reduce public parking incentives – both direct and indirect, by (percentage) during the next fiscal year cycle.	
2.2.1	Eliminate all free parking programs by FY2017
2.2.2	Work with event organizers to promote alternate modes of transportation or parking options
Objective 3: Increase public transit use across City to an annual ridership of (number) passengers by (year).	
2.3.1	Continue to maintain relationship with the Frederick County Transportation Department and TransIT
2.3.2	Encourage the County into expanding the existing bus system by adding new service areas, additional frequencies, and expanded sp
2.3.3	Continue to support and contribute funding to the purchase of electric bus fleet, which will decrease fleet emissions

ar).	TIMEFRAME	LEAD AGENCY
	Short-term	(INSERT APPROPRIATE AGENCY)
	Mid-term	(INSERT APPROPRIATE AGENCY)
	Mid-term	(INSERT APPROPRIATE AGENCY)
	Short-term	(INSERT APPROPRIATE AGENCY)
	Mid-term	(INSERT APPROPRIATE AGENCY)
	Mid-term	(INSERT APPROPRIATE AGENCY)
	Short-term	(INSERT APPROPRIATE AGENCY)
	Mid-term	(INSERT APPROPRIATE AGENCY)
	Mid-term	(INSERT APPROPRIATE AGENCY)
	Short-term	(INSERT APPROPRIATE AGENCY)
	Ongoing	(INSERT APPROPRIATE AGENCY)
	Ongoing	(INSERT APPROPRIATE AGENCY)
	Mid-term	(INSERT APPROPRIATE AGENCY)
	Mid-term	(INSERT APPROPRIATE AGENCY)
	Short-term	(INSERT APPROPRIATE AGENCY)
	Short-term	(INSERT APPROPRIATE AGENCY)
	Immediate	(INSERT APPROPRIATE AGENCY)
	Ongoing	(INSERT APPROPRIATE AGENCY)
oans of service where the potential for additional ridership exists	Mid-term	(INSERT APPROPRIATE AGENCY)
	Ongoing	(INSERT APPROPRIATE AGENCY)

GOALS, OBJECTIVES AND ACTIONS SUMMARY TABLE

Objective 4: Increase (percentage) of connectivity to downtown through City circulator by (year).	
2.4.1	Identify boundary of circulator
2.4.2	Identify major hubs or points of interest inside the downtown Frederick area that would be connect other hubs within the downtown
2.4.3	Identify storage area for circulator vehicles
2.4.4	Draft maintenance and capital expenditures plan for circulator
2.4.5	Identify funding source
Objective 5: Launch car share program by (year).	
2.5.1	Using Census data, determine cars per household in Census tracts to find car needs among area residents
2.5.2	Identify parking spaces that can be leased out to carshare
Goal 3: Encourage sustainable policies, regulations, and laws at the city and county level	
Objective 1: 100% city departments and agencies to practice idling regulations unless otherwise noted by 2016.	
3.1.1	Draft a resolution formally adding idling regulations to City policy
3.1.2	Pass resolution into local law
Objective 2: All future long-range, sector/small, and comprehensive plans to include sustainability components in transportation.	
3.2.1	Consult with Sustainability Coordinator during every major plan rewrite
Objective 3: Advocate at county level for adoption of "bus on shoulder" on highways during peak hours (year).	
3.3.1	Draft resolution advocating county TransIT to write into law
3.3.2	Pass resolution advocating for "bus on shoulder"
3.3.3	Write into sector plans and master plans, where appropriate and under jurisdiction of City, that buses may use shoulder during peak
3.3.4	Make a priority during TransIT committee meetings
Objective 4: 75% of all City vehicles to be green or use alternative fuels by (year).	
3.4.1	Collect data on VMT and fuel efficiency for each vehicle
3.4.2	Identify those vehicles with easiest green alternatives
3.4.3	Perform cost/benefit analysis comparing retrofitting of cars versus selling old fleet and purchasing green fleet
Objective 5: 75% of local streets within City boundaries to become "complete streets" by 2035.	
3.5.1	Continue policy requirement for developers to road connectivity where there is already multi-modal access.
3.5.2	Each new sector plan or master plan should include complete streets in every possible instance on roads within the City's jurisdiction
3.5.3	City should advocate at County level for new plans adjacent to City boundaries include complete street components
3.5.4	Identify grants and funding sources in the City budget to accomplish progress in a timely manner

	Short-term	(INSERT APPROPRIATE AGENCY)
n area	Short-term	(INSERT APPROPRIATE AGENCY)
	Short-term	(INSERT APPROPRIATE AGENCY)
	Short-term	(INSERT APPROPRIATE AGENCY)
	Short-term	(INSERT APPROPRIATE AGENCY)
	Short-term	(INSERT APPROPRIATE AGENCY)
	Short-term	(INSERT APPROPRIATE AGENCY)
	Immediate	(INSERT APPROPRIATE AGENCY)
	Short-term	(INSERT APPROPRIATE AGENCY)
	Ongoing	(INSERT APPROPRIATE AGENCY)
	Short-term	(INSERT APPROPRIATE AGENCY)
	Short-term	(INSERT APPROPRIATE AGENCY)
hours.	Ongoing	(INSERT APPROPRIATE AGENCY)
	Immediate	(INSERT APPROPRIATE AGENCY)
	Mid-term	(INSERT APPROPRIATE AGENCY)
	Short-term	(INSERT APPROPRIATE AGENCY)
	Mid-term	(INSERT APPROPRIATE AGENCY)
	Ongoing	(INSERT APPROPRIATE AGENCY)
n	Ongoing	(INSERT APPROPRIATE AGENCY)
	Ongoing	(INSERT APPROPRIATE AGENCY)
	Ongoing	(INSERT APPROPRIATE AGENCY)

GOALS, OBJECTIVES AND ACTIONS SUMMARY TABLE

3.5.4	Identify grants and funding sources in the City budget to accomplish progress in a timely manner
Objective 6: Advocate at county level to change zoning obstacles that disincentivize sustainable practices for multi-modal transportation and lim	
3.6.1	Draft resolution for Board of Aldermen to endorse zoning rewrite that underground parking structures need not be included in total
3.6.2	Research Parking Districts
3.6.3	Tiered minimum and maximum parking restrictions for developers based on proximity to public transportation options

	Ongoing	(INSERT APPROPRIATE AGENCY)
nited required parking by (year).		
Floor Area Ratio	Short-term	(INSERT APPROPRIATE AGENCY)
	Ongoing	(INSERT APPROPRIATE AGENCY)
	Ongoing	(INSERT APPROPRIATE AGENCY)

10 | Food & Nutrition

Introduction

Goals:

1. Promoting local and regional food production.
2. Eliminate hunger and increase nutritional outcomes for those most in need in the City of Frederick.
3. Foster a healthier municipal government that can be an example to other jurisdictions.

The City of Frederick is an important agriculture and food connector in the Washington and Baltimore metropolitan. The West Frederick Market, one of several located within the city, was voted 15th in the nation, providing fresh locally-grown produce during the growing season. However, those markets are only open on specific days for a few hours. This leaves many without access to food - particularly in neighborhoods with low vehicle access and high poverty.

According to recent census data, NAC 11 and NAC 12 are the most food sensitive regions. Together, they have 2,991 households with nearly 60 percent living without a vehicle that would provide easy access to nutritious food. Given this reality, a new grocery store in NAC 11 or 12 or creation of one of the existing farmers markets into a permanent year around market in this critical area must be explored. (See Appendix F.1 for more information.)

Frederick City residents have expressed increased interest in growing food that is only a few feet or miles from home. Willowbrook and Hargett Farm parks offer a total of 72 plots of community garden space, each plot being 1,250 square feet. More than two acres of park space has been dedicated to community gardens, allowing garden space for city residents that may not otherwise have access to garden space to grow their own food. In addition to using City-owned open space for growing food, some residents have expressed interest in raising livestock in their own yards. Currently, there are no options for raising livestock, limiting residents' ability to opt for hyper-local food.

While the county government manages food policy in the public schools, the City of Frederick through the Frederick Community Action agency has taken great steps to provide food for those most food sensitive children through the summer food service program, backpack program, and after-school snack program. They also run the Frederick Foodbank and Frederick Soup Kitchen-providing healthy meals to the city's poor and disadvantaged families.

1 Goal: Promote local and regional food production

Why?

ECONOMY

Promoting local food production can bolster the Frederick economy. Academic research has linked proper nutrition to a host of long-term workforce productivity, health, and safety in communities.

ENVIRONMENT

Encouraging local food production lowers transportation costs of food and its carbon footprint.

EQUITY

Combined with policies of adequate access, promotion of local food sources can help increase access to food to lower income and food sensitive groups.

Objective 1:

Enact or alter current code and permitting to create a more robust and easy local, urban agriculture by (year).

Local food brings a sense of civic pride, can boost the local economy, create better nutritional outcomes, and foster a sense of place and civic involvement in communities. It can also jump start the hospitality, tourism, and service sectors of the economy.

Actions:

1. Encourage the expansion of the current community gardens program and waive leasing fees (if any) for nonprofits, community centers, and county public schools on municipal land.

   Mid-term **Agency**: (INSERT APPROPRIATE AGENCY)

   Potential Partners: School Board and County, Neighborhood Associations, Park Associations, NACs, Farm Frederick

2. Amend current zoning to permit and encourage market gardens.

   Mid-term **Agency**: (INSERT APPROPRIATE AGENCY)

   Potential Partners: FarmFrederick, Willow Brook and Hargett Farm, NACs, Neighborhood Associations,

3. Create and adopt a clear and consistent policy for raising livestock and bees in the city, and educate the public about the benefits of urban agriculture.

   Mid-term **Agency**: (INSERT APPROPRIATE AGENCY)

   Potential Partners: Potential Partners: Local restaurants, NACs, FarmFrederick
   For examples of specific legislation and Maryland resources for chicken code in cities see the City of Annapolis (City of Annapolis 2012)

1 Goal: Promote local and regional food production

Objective 2:

Identify (number) of areas for possible farmer's markets by (year), easing the ability for regional and local food producers to sell produce.

Actions:

1. Amend current zoning to allow accessory commercial kitchens to allow for food processing by churches, nonprofits, and food entrepreneurs to regional businesses.

   Mid-term **Agency**: *(INSERT APPROPRIATE AGENCY)*

   Potential Partners: Food Entrepreneurs, Local food banks and churches, nonprofit organizations

2. Develop and implement a "buy local" or "sustainable stewardship" program for Frederick to procure food from local businesses, regional farmers, and organic foods. This program could include other green policies including health, waste management, and energy conservation.

   Mid-term **Agency**: *(INSERT APPROPRIATE AGENCY)*

   Potential Partners: Maryland Green Travel, Chesapeake Bay Foundation, Frederick County government, local farmers and restaurants, Chamber of Commerce

   Funding Sources: General budget, application fees by sustainable businesses, sponsorship by local companies and farmers or tourism groups
   See Hartford County, Maryland for a local program

Objective 3:

Create a permaculture "food forest" or food educational park in the Frederick by (year) education to the population.

Actions:

1. Investigate and implement the creation of an educational permaculture "food forest" in an existing public park or discuss with developers about exploring permaculture solutions in new developments.

   Ongoing **Agency**: *(INSERT APPROPRIATE AGENCY)*

2 Goal: Eliminate hunger and increase nutritional outcomes for those most in need in the City of Frederick.

Why?

ECONOMY

Good nutrition is the smart financial decision of cities. Access to healthy food can help prevent obesity and related chronic diseases such as diabetes and heart disease. A healthier population decreases health-related costs that burden both government and the individual (Yale University n.d.).

ENVIRONMENT

Fresh food- particularly from local sources- helps limit carbon emissions by keeping production local.

EQUITY

Proving fresh food to low income populations help raise their standard of living, health, and can help them move out of poverty.

Objective 1:

Eliminate (percentage) of food deserts by (year), increasing and strengthening access in needy neighborhoods.

Actions:

1. Identify and map all food deserts in the City of Frederick.

   Mid-term **Agency**: *(INSERT APPROPRIATE AGENCY)*

2. Create a public education and outreach campaign targeted to food sensitive and low-income areas about WIC and SNAP programs at nearby farmer's markets and advertising farmer's market hours.

   Mid-term **Agency**: *(INSERT APPROPRIATE AGENCY)*

   Potential Partners: Frederick County government, School Board, Frederick Fresh Farmer's Market, Frederick Area Foodbank, Frederick Rescue Mission, Second Street and Hope Food Bank, Everedy Square Shab Row Farmers Market, the Frederick City Market, and the farmer's market at the Great Frederick Fair, Farm Frederick, Frederick Chamber of Commerce, Centennial Memorial United Methodist Church, Religious Coalition for Emergency Human Needs, Frederick Rescue Mission, Salvation Army

3. Identify and create a permanent market to provide daily access to food in the large food desert in the downtown and eastern portion of the city - which is largely without permanent access. Interim solutions could include immediately making existing farmer's markets year-round and gradually expanding the hours of existing farmer's market until they are permanent or exploring possible infill spaces or vacant spaces for a permanent farmer's market or private grocery store.

   Short-term **Agency**: *(INSERT APPROPRIATE AGENCY)*

   Local farmer's markets and related organizations, local food businesses (like Morningstar Farms or ALDI), Frederick Chamber of Commerce, Frederick Food Bank, Farmer's Cooperative

4. Create a partnerships program with area restaurants and farms to cook meals or provide leftover food to the Frederick Food bank and other area kitchens to provide food for the hungry.

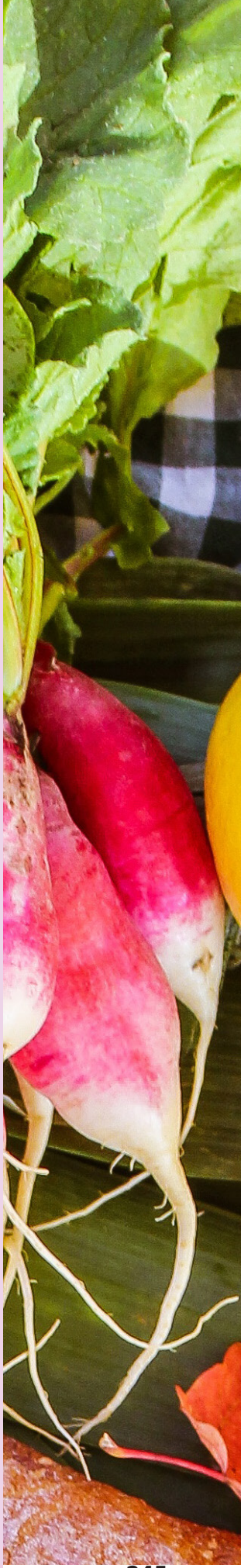
   Mid-term **Agency**: *(INSERT APPROPRIATE AGENCY)*

   Potential Partners: Nonprofits/religious organizations with soup kitchens/food pantry, Bryan Voltaggio, Area restaurateurs, Chamber of Commerce
   Funding Sources: Self-financed through partnership and sponsorships

5. Research access to the Frederick food kitchen and SNAP benefits at farmer's markets, grocers, and convenience stores. If food access is limited explore partnering with local businesses to either create a mobile food bank or provide fresh, healthy food in existing

   Mid-term **Agency**: *(INSERT APPROPRIATE AGENCY)*

   Potential Partners: Local nonprofits, local religious groups and soup kitchens, Frederick County government, Food-oriented businesses willing to donate (ALDI factory or Morningstar Farms)



3 Goal: Foster a healthier municipal government that can be an example to other jurisdictions.

Why?

ECONOMY

Obesity and unhealthy lifestyles hurts workforce productivity and costs the City money.

ENVIRONMENT

Increased awareness should lead to higher demand for fresh, locally grown produce which reduces our carbon footprint by decreasing transportation of food.

EQUITY

Consumption of hearty, nutritious food has been linked to improved behavior, higher grades and better well-being (Kristjánsson, Sigfúsdóttir and Allegrante 2008)

Benchmarks:

- 25 percent Healthy options must be available in all machines.
- All catering needs will be local.
- 50 percent of all food options from vending machines must be healthy.

Objective 1:

Implement the recommendations of the Healthy Eating Active Living (HEAL) Resolution in (percentage) of City buildings by (year).

In summer of 2015, the Frederick Board of Aldermen took the important step of signing a healthy eating active living resolution. The next step is to implement the recommendations outlined in the resolution to create a healthier and productive municipal workforce that can be an example to the city. Obesity and unhealthy lifestyles hurts workforce productivity and costs the city money

Actions:

1. Physical Activity Break Policies: Give employees at least 10 minutes of paid time daily or 50 minutes weekly to do physical activity.

   Short-term — ***Agency**: (INSERT APPROPRIATE AGENCY)*

2. Fostering Active Stairwell policy to encourage workforce to use stairs.

   Short-term — ***Agency**: (INSERT APPROPRIATE AGENCY)*

3. Encouraging walking meetings in order to fit physical activity into the workday and improve the physical and mental well-being of our employees.

   Short-term — ***Agency**: (INSERT APPROPRIATE AGENCY)*

4. Reduce barriers to breastfeeding in the municipal workplace by continuing to designate lactation space for breastfeeding mothers within each building owned by the City and used for government purposes.

   Ongoing — ***Agency**: (INSERT APPROPRIATE AGENCY)*

Objective 2:

Promote healthy and local food through changing municipal procurement practices to (percentage) local by (year).

Actions:

1. Change municipal procurement policies to only buy from healthy or local restaurants, food producers, and businesses such that all snack machines, catering, and other food stocked by the City government is local and has healthy options.

   Mid-term — ***Agency**: (INSERT APPROPRIATE AGENCY)*

   Potential Partners: Local area businesses, Chamber of Commerce

FOOD AND NUTRITION ANALYSIS

The following pages are in-depth analyses of each goal and objective - detailing case studies, best practices, and implementation methods. It is meant to be supplementary material that can guide Frederick.

GOAL ONE | OBJECTIVE ONE:

1) Enact or alter current code and permitting to create a more robust and easy local, urban agriculture by (year).

Case Study: Minneapolis, MN

In 2012, the City of Minneapolis successfully enacted legislation allowing for market gardens and urban farms. This effort takes elevates small community gardens allowing for increased economic viability- expanding health and access to local, healthy food by citizens. To ensure public safety, the city provided users with health and safety guidelines. In return, the market gardens had to submit an application and related fees that paid for the expanded regulations

Promoting local food production not can be a part of increasing better nutritional outcomes for the City of Frederick but also bolster its economy, better the environment, and work towards a more equitable city.

Supporting local food production can bolster the Frederick economy by keeping business in the city and county. Easing local food production by low income populations can help alleviating poverty by decreasing the risk for hunger, increasing health (Local & Regional Food Systems n.d.). When cities have created stronger partnerships with local agriculture through community gardens educated the population about its benefits- there is demonstrated better health outcomes (Twiss J 2003). Better nutrition through access to healthy food makes a more productive local workforce. The New Economics Foundation, an independent economic think tank based in London, compared what happens when people buy produce at a supermarket instead of a local farmer's market or community supported agriculture (CSA) program and found that twice the money stayed in the community when folks bought locally (Schwartz 2015). The study showed that local purchases are twice as efficient at keeping the local economy alive. (Schwartz 2015). Encouraging local food production lowers transportation costs of food and its carbon footprint. As more food is grown in and near to cities, existing natural green spaces are kept wild- protecting the environment in non-urban areas. Local food, in the case of Frederick, means linking consumers to the vast array of local vegetable and fruit farms. This promotion of local vegetables and fruits promotes a more balanced diet that has the added benefit of producing less carbon footprint than a diet high in meat (Center for Sustainable Systems, University of Michigan 2014).

Connecting people to regional food and local farms could foster greater knowledge, appreciation, and pride towards the agricultural heritage of the Frederick region. This emphasis on the City of Frederick can build upon a sense of placemaking the city is already undertaking in its current approach to planning. An emphasis on local food can also help increase access to food to lower income and food sensitive groups (Center for Sustainable Systems, University of Michigan 2014).

O-1:
Local food brings a sense of civic pride, can boost the local economy, create better nutritional outcomes, and foster a sense of place and civic involvement in communities. It can also jump start the hospitality, tourism, and service sectors of the economy. By focusing first on altering or enacting a change in permitting and code, Frederick can build upon its successful farmer's markets and community garden to create an even more robust local food system. Because a majority of these changes relate to code enforcement and permitting the code enforcement and permitting department is the lead agency for this objective.

One of the most achievable objectives is simply to help strengthen the urban agriculture Frederick already is undertaking. Frederick can begin by encouraging the expansion of the current community gardens program and waive leasing fees (if any exist) for nonprofits, community centers, and county public schools on municipal land. Regional cities like Washington and peer cities across the county have used the community garden system to expand knowledge of

GOAL ONE:

Promote Local and Regional Food Production.

proper nutrition- particularly to children. This is most effective in areas like public schools and community centers. One way several cities have accomplished this is by waiving or lessening leasing fees (if any) for non-profits, community centers, and county public schools on municipal land.

Another way to support current urban farming practices is to amend current zoning to permit market gardens (Homegrown Minneapolis 2014). Access to land and capital is one of the most cited difficulties in establishing urban farms and garden (Golden 2013). To help strengthen their economic success cities like Washington, Minneapolis, and several smaller jurisdictions in Vermont and the West Coast have amended their zoning to allow community gardens and urban farms to sell food directly on site. These community gardens, in effect, become "market gardens" – and can act as small businesses serving their community. This has the added benefit of also strengthening community knowledge of these gardens and farms as they become part of the local retail ecology of their neighborhoods.

The city can also do more to empower agriculture among citizens. Information given to the City of Frederick to PALS indicated many residents of Frederick were interested in raising local livestock and fostering a more robust local food economy. The city can follow the example of hundreds of cities across the country and create and adopt a clear and consistent policy for raising livestock and bees in the city. To make the policy truly work they can educate the public about the benefits of urban agriculture.

It is an increasingly necessary change for cities to adopt these policies to become up-to-date with current sustainable practices across the country. Livestock policies for urban jurisdictions have become commonplace in hundreds of jurisdictions across the nation from Annapolis and College Park in Maryland to Austin, Texas and Portland, Oregon (City of Annapolis 2012, Austin 2010, City of Portland 2015). Livestock policies include allowing for apiary or bee colonies, backyard chickens, goats for grazing and clearing grasslands, and more.

These livestock ordinances can be symbiotic with community gardens and help promote a more obtainable organic food system- which may appeal to many residents. Furthermore, along with market garden regulations, livestock regulations can provide easy side income for families with the sale of chicken eggs or local honey. For a local example with a factsheet for zoning and permitting, see the City of cities see the City of Annapolis (City of Annapolis 2012). For a more robust livestock ordinance that includes a wider range of livestock and addresses community concerns related to pests and noise, see the City of Austin (Austin 2010).

GOAL ONE | OBJECTIVE ONE:

1) Identify (number) of areas for possible farmer's markets by (year), easing the ability for regional and local food producers to sell produce.

Case Study: College Park, MD

Trolley Forest- City of College Park: The City of College Park has an ongoing project to retrofit its current Trolley Park into an edible forest- along with educational wayfinding devices that teach people about healthy local foods. The project is possible through a coalition between local residents, the City's park and recreation, the Neighborhood Design Center, and Forested- a small landscape architecture firm. The project uses a combination of funding from local funds already set aside for park upgrades and Community Development Block Grants. Ultimately, the park will help strengthen connections between a low-income neighborhood and moderate-income neighborhood and provide food and nutrition education to the population

GOAL ONE:

Promote Local and Regional Food Production.

O-1:
With zoning altered to allow for more robust community farms and local agriculture. The City of Frederick can concurrently begin to promote a local "food culture" that will economic strengthen the local economy and support tourism, agriculture, and service industries in the city and county. The lead agency for this objective is the Department of Economic Development due to its chief orientation towards economic sustainability. All these recommendations and actions would be strengthened through countywide or region-wide partnerships that can brand Western Maryland's agriculture.

Many jurisdictions, including regional ones like Takoma Park, Maryland and Montgomery County- have amended current zoning to allow accessory commercial kitchens to allow for food processing by churches, nonprofits, and food entrepreneurs to regional businesses (City of Takoma Park 2012). Many times, churches, restaurants, and small entrepreneurs oftentimes need to use a kitchen only for temporary hours or short-term uses without the regulatory burden a restaurant would have. This encourages local businesses and festivals and in the case of churches and nonprofits- allows them to serve their communities and food sensitive populations easier.

The City could also develop and implement a "buy local" or "sustainable stewardship" program for Frederick to procure food from local businesses, regional farmers, and organic foods. This program could include other green policies including health, waste management, and energy conservation (The City of Annapolis n.d.). These programs help develop a sense of local pride and strengthen businesses by connecting them to fresher food and educate food suppliers in the city about sustainability. Buy local programs also help promote a sustainable economy by the citizens of Frederick as they learn, promote, and value the economic and food resources available in the city. Potential partners in the program include Maryland Green Travel, Chesapeake Bay Foundation, Frederick County government, local farmers and restaurants, and local Chambers of Commerce.

Cities like Annapolis have used application fees by sustainable businesses and sponsorships by local companies, farmers, or tourism groups to partially sponsor the program. Other places have integrated it as part of its marketing strategy for the city and collaborated with the chamber of commerce or used general funds.

The Vermont "Fresh Program" is a successful state-run program that connects farmers, food producers and chefs to work directly with each other to build partnerships. The program has a number of activities from speed dating with local food buyers and producers, monthly newsletters; diner series, which help, sponsor the program, and on-farm diners. Most relevant for Frederick, the program brands the food from Vermont and creates an identity that economically boosts tourism and local consumption. The City of Annapolis has created a sustainable food certification program that has a similar goal with more limited scope more appropriate for a city but with more success. The key to a successful program will be coordination with chambers of commerce, the county, or the larger region.

O-2:
Cities from College Park, Maryland to Seattle, Washington have begun to add permaculture to the vocabulary of sustainable park and

2) Create a permaculture "food forest" or food educational park in the Frederick by (year) education to the population.

place making – with the added benefit of bringing nutrition education and fresh food to communities. Permaculture is a system of cultivation intended to maintain permanent agriculture or horticulture by relying on renewable resources and a self-sustaining ecosystem (dictionary.com n.d.). In a food forest or permaculture park, parks are outfitted with a variety of local food, herbs, and plant life with placards or information on what their uses. Due to a combination of nitrogen fixing plants and sustainable agricultural choices, fertilizer and pesticides are not necessary. For a comprehensive look at permaculture see Appendix F.2.

Visitors to the park, typically through informational signs, are invited to pick fruits, herbs, and vegetables while learning about local ecosystems and ecologies. Food forests as parks solve a number of sustainability objectives. They make parks productive landscapes that are beautiful parks that also provide food to the community and they educate the general population about nutrition and sustainability. Moreover, they can be part of larger planning objectives towards placemaking. While food forests are not always easy to develop, Frederick should use it as a long-term strategy and tool for place making as they redevelop and create new city parks and recreation areas. Investigate and implement the creation of an educational permaculture "food forest" in an existing public park or discuss with developers about exploring permaculture solutions in new developments.

The City of College Park has an ongoing project to retrofit its current Trolley Park into an edible forest- along with educational wayfinding devices that teach people about healthy local foods. The project is possible through a coalition between local residents, the City's park and recreation, the Neighborhood Design Center, and Forested- a small landscape architecture firm. The project uses a combination of funding from local funds already set aside for park upgrades and Community Development Block Grants. Ultimately, the park will help strengthen connections between a low-income neighborhood and moderate-income neighborhood and provide food and nutrition education to the population. While the project is ongoing in College Park, other jurisdictions like Seattle's seven-acre Beacon Park food forest are rapidly emerging as an important civic space in the city that educates and provides free food to visitors (Department of Neighborhoods 2015). Potential local partners for implementation include FarmFrederick, NACs, FrederickPost, Food Entrepreneurs Local Schools, and the variety of park beautification community groups operating in the city.

Case Study: Vermont

Vermont "Fresh Program" is a successful state-run program that connects farmers, food producers and chefs to work directly with each other to build partnerships. The program has a number of activities from speed dating with local food buyers and producers, monthly newsletters, diner series which help sponsor the program, and on-farm diners. Most relevant for Frederick, the program brands the food from Vermont and creates an identity that economically boosts tourism and local consumption (Vermont Fresh Network 2015).

GOAL TWO | OBJECTIVE ONE:

2)Eliminate (percentage) of food deserts by (year), increasing and strengthening access in needy neighborhoods.

"The 1976 Tax Reform Act (Section 2135), provides business taxpayers that make inventory donations to charities can receive an income tax deduction."

O-1:
Good nutrition is the smart financial decision of cities. Access to healthy food can help prevent obesity and related chronic diseases such as diabetes and heart disease. A healthier population decreases health-related costs that burden both government and the individual. Bringing food to low-income areas, and helping smaller groceries and markets expand their stock of healthy and affordable items, is a win-win situation for communities and residents - helping increase employment, increase revenue, and encouraging healthy diets. Reduces risks of obesity and unhealthy lifestyles, particularly among children and teens; reduces risks of medical conditions such as heart disease, teenage diabetes, cancer and respiratory illness, or dietary-related chronic diseases. Consumption of hearty, nutritious food has been linked to improved behavior, higher grades and better well-being. Moreover, fresh food- is from local sources- helps limit carbon emissions.

Food access is not only a critical social responsibility but it will help foster a more equitable and economically sustainable city. Access to nutritious food helps to increase educational and productivity outcomes (USDA Food and Nutrition Information Center 2011). Access has also been shown to promote healthiness and life expectancy, reduce crime, and a host of other positive outcomes (Fourteen Reasons Why Food Security Is Important n.d.). Malnutrition is even linked to increases in antisocial behavior and criminal activity. Combating hunger and helping people get better access to nutrition will help make Frederick a better, more sustainable city and economy.

There is a demonstrated need for food access in large portions of Frederick and the demand for new grocery stores or food access spaces. For a comprehensive analysis of where the communities most in need are and the demand for grocery stores, see Appendix F.1. Access to food is also a part of recent sustainability legislation passed by the city as part of the HEAL resolution. HEAL promotes access to affordable, nutritious foods as a central tenant.

The city already has several farmers' markets that take SNAP and WIC benefits near to food desert and low-income areas. A study conducted by the USDA found lack of knowledge about SNAP and WIC benefits at farmer's markets one of the biggest impediments to linking to underserved populations (Karakus, et al. 2014). Informal interviews with Frederick farmer's market participants revealed a lack of knowledge of SNAP and WIC usage and lack of clarity if low-income populations were being served. Public campaigns to low income, seniors, and minority groups that are food sensitive about farmer's markets would strengthen their viability and provide access to existing food infrastructure. To foster awareness to the communities most in need, Frederick should aim to create a public education and outreach campaign targeted to food sensitive and low-income areas about WIC and SNAP programs at nearby farmer's markets. Part of this must also be to advertise farmer's market hours and ensure they serve the population.

Potential partners include Frederick County government and local School Board which can perhaps integrate education to families. Specific markets include those that serve the Golden Mile as well as the downtown markets and food banks at Frederick Fresh Farmer's Market, Frederick Area

GOAL TWO:

Eliminate Hunger and increase nutritional outcomes for those most in need in the City of Frederick

Foodbank, Frederick Rescue Mission, Second Street and Hope Food Bank, Everedy Square Shab Row Farmers Market, the Frederick City Market, the farmer's market at the Great Frederick Fair, Centennial Memorial United Methodist Church, Religious Coalition for Emergency Human Needs, Frederick Rescue Mission, and the Salvation Army. For possible funding sources for this program, see Appendix F.3.

As a longer term strategy to serve all groups in food deserts, the city should identify and create a permanent market to provide daily access to food in the large food desert in the downtown and eastern portion of the city - which is largely without permanent access. Interim solutions could include immediately making existing farmer's markets year-round and gradually expanding the hours of existing farmer's market until they are permanent or exploring possible infill spaces or vacant spaces for a permanent farmer's market or private grocery store. To make this a reality, the city should look to partner with local farmer's market and related organization, local companies and businesses that work in the food service sector (like Morningstar Farms or ALDI which both have facilities in Eastern Frederick), and the Farmer' Cooperative. The city could also work with local NACs and the Chamber of Commerce to galvanize support for the initiative. See Appendix F.1 which reveals that there is demand for a walkable grocery store in the urban core.

To help support area food banks, Frederick should create a partnerships program with area restaurants and farms to cook meals or provide leftover food to the Frederick Food bank and other area kitchens to provide food for the hungry. Restaurants and chains that donate food can benefit by receiving tax deductions. The 1976 Tax Reform Act (Section 2135), business taxpayers that make inventory donations to charities can receive an income tax deduction. The Act permits the donating business to determine the "fair market value" of the donation, which cannot surpass two times the cost of the donated inventory. Frederick's Community Action Agency and other food organizations should partner with the chamber of commerce and other restaurants in the city- with their robust food culture with local star chiefs like Bryan Voltaggio – to make this potential objective a reality. The US Department of Agriculture also maintains an active list of nonprofits that work nationwide to eliminate food waste that could partner with the City of Frederick (USDA Office of the Chief Economist n.d.).

Last, the city should research and identify knowledge of and access to the Frederick food kitchen and SNAP benefits at farmer's markets, grocers, and convenience stores. If food access is limited explore partnering with local businesses to either create a mobile food bank or provide fresh, healthy food in existing retail corner stores in needy areas. This may be redundant if farmer's market education programs and long-term strategies like grocery stores are implemented. However, more research is needed and may reveal other areas of high need where a mobile grocer or specifically targeted food bank location may have the greatest success.

GOAL THREE | OBJECTIVE ONE - TWO:

1) Implement the recommendations of the Healthy Eating Active Living (HEAL) Resolution in (percentage) of City buildings by (year).

"Consumption of hearty, nutritious food has been linked to improved behavior, higher grades and better well-being- which translates to a healthier more productive workforce."

In the summer of 2015, the Frederick Board of Aldermen took the important step of signing a healthy eating active living resolution. The next step is to implement the recommendations outlined in the resolution to create a healthier and productive municipal workforce that can be an example to the city. Implementing the HEAL resolution along with promoting healthy and local food through changing municipal procurement practices will lead to a more sustainable and productive city government.

Implementation will lead to a host of positive economy, environment, and sustainable outcomes. Increased awareness will lead to higher demand for fresh, nutritious produce, which reduces our carbon footprint by decreasing transportation of food. Consumption of hearty, nutritious food has been linked to improved behavior, higher grades and better well-being- which translates to a healthier more productive workforce (Kristjánsson, Sigfúsdóttir and Allegrante 2008).

O-1:
Implementation of the HEAL resolution should be one of the first actions taken by the city as it moves towards a healthier, sustainable workforce. Important actions that the HEAL resolution mandates including physical activity break policies where employees are given at least 10 minutes of paid time daily or 50 minutes weekly to do physical activity. The city can also ensure that all facilities foster an active stairwell policy to encourage workforce to use stairs. To further encourage physical activity, HEAL also recommends encouraging walking meetings in order to fit physical activity into the workday and improve the physical and mental well-being of our employees. The City

HEALTHY VENDING STANDARDS:

Government Services Administration Guidelines for Federal Concessions and Vending Operations (last 2 pages): http://www.gsa.gov/graphics/pbs/Guidelines_for_Federal_Concessions_and_Vending_Operations.pdf
Nutritional Environment Measures Survey – Vending (NEMS-V) which is based on the Institute of Medicine (IOM) Nutrition Standards for Foods in Schools: http://www.nems-v.com/

Nemours Healthy Vending Guide, which categorizes foods and beverages by their nutrient density as "GO," "SLOW" and "WHOA" production: http://www.nemours.org/content/dam/nemours/www/filebox/service/preventive/nhps/resource/healthyvending.pdf

Fit Pick™, a healthy vending program created by the National Automatic Merchandizing Association (NAMA): http://fitpick.org
Snackwise®, a model that utilizes 11 parameters and an online calculator to rate snacks as either "best choice," "choose occasionally," or "choose rarely": http://snackwise.org

GOAL THREE:

Foster a healthier municipal government that can be an example to other jurisdictions.

already has reduced barriers to breastfeeding in the municipal workplace but should continue to designate lactation space for breastfeeding mothers within each building owned by the City and used for government purposes.

O-2:
The city can alter its procurement practices to encourage a healthier municipal workforce and set an example of proper nutrition for the entire city. Changes include altering municipal procurement policies to only buy from healthy or local restaurants, food producers, and businesses. Such a policy change should also ensure that all snack machines, catering, and other food stocked by the city government is local and has healthy (and ideally local) options. The city can further ensure locally sourced and healthy food by auditing city finances to ensure all food that is purchased for events, conferences, or event is from local sources.

TOOL KITS:

Bay Area/San Diego and Imperial Regional Nutrition Network Vending Machine Toolkit: http://www.banpac.org/healthy_vending_machine_toolkit.htm

Knox County, TN Healthy Vending Toolkit: http://knoxcounty.org/health/pdfs/vending_toolkit.pdf
Nemours Healthy Vending Guide: http://www.nemours.org/content/dam/nemours/www/filebox/service/preventive/nhps/resource/healthyvending.pdf

OTHER:

Improving the Food Environment Through Nutrition Standards: A Guide for Government Procurement: www.cdc.gov/salt/pdfs/DHDSP_Procurement_Guide.pdf.

ASTPHND: Various examples and resources have been gathered and saved on ASTPHND's website: http://www.astphnd.org/resource_read.php?resource_id=225

GOALS, OBJECTIVES AND ACTIONS SUMMARY TABLE

Goal 1: Promote Local and Regional Food Production	
Objective 1: Enact or alter current code and permitting to create a more robust and easy local, urban agriculture by (year.)	
1.1.1	Encourage the expansion of the current community gardens program and waive leasing fees (if any) for nonprofits, community cen
1.1.2	Amend current zoning to permit and encourage market gardens.
1.1.3	Create and adopt a clear and consistent policy for raising livestock and bees in the city, and educate the public about the benefits o
Objective 2 : Identify (number) of areas for possible farmer's markets by (year), easing the ability for regional and local food producers to sell proc	
1.2.1	Amend current zoning to allow accessory commercial kitchens to allow for food processing by churches, nonprofits, and food entre
1.2.2	Develop and implement a "buy local" or "sustainable stewardship" program for Frederick to procure food from local businesses, reg
Objective 3 : Create a permaculture "food forest" or food educational park in the Frederick by (year) education to the population.	
1.3.1	Investigate and implement the creation of an educational permaculture "food forest" in an existing public park or discuss with deve
Goal 2: Eliminate Hunger and increase nutritional outcomes for those most in need in the city of Frederick	
Objective 1: Eliminate (percentage) of food deserts by (year), increasing and strengthening access in needy neighborhoods.	
2.1.1	Identify and map all food deserts in the City of Frederick.
2.1.2	Create a public education and outreach campaign targeted to food sensitive and low-income areas about WIC and SNAP programs
2.1.3	Identify and create a permanent market to provide daily access to food in the large food desert in the downtown and eastern portic
2.1.4	Create a partnerships program with area restaurants and farms to cook meals or provide leftover food to the Frederick Food bank ar
2.1.3	Research access to the Frederick food kitchen and SNAP benefits at farmer's markets, grocers, and convenience stores.
Goal 3: Foster a healthier municipal government that can be an example to other jurisdictions.	
Objective 1: Implement the recommendations of the Healthy Eating Active Living (HEAL) Resolution in (percentage) of City buildings by (year.)	
3.1.1	Physical Activity Break Policies: Give employees at least 10 minutes of paid time daily or 50 minutes weekly to do physical activity.
3.1.2	Fostering Active Stairwell policy to encourage workforce to use stairs.
3.1.3	Encouraging walking meetings in order to fit physical activity into the workday and improve the physical and mental well-being of c
3.1.4	Reduce barriers to breastfeeding in the municipal workplace by continuing to designate lactation space for breastfeeding mothers
Objective 2 : Promote healthy and local food through changing municipal procurement practices to (percentage) local by (year.)	
3.2.1	Change municipal procurement policies to only buy from healthy or local restaurants, food producers, and businesses

	TIMEFRAME	LEAD AGENCY
ters, and county public schools on municipal land.	Mid-term	(INSERT APPROPRIATE AGENCY)
	Mid-term	(INSERT APPROPRIATE AGENCY)
f urban agriculture.	Mid-term	(INSERT APPROPRIATE AGENCY)
duce.		
epreneurs to regional businesses.	Mid-term	(INSERT APPROPRIATE AGENCY)
ional farmers, and organic foods.	Mid-term	(INSERT APPROPRIATE AGENCY)
elopers about exploring permaculture solutions.	Long-term	(INSERT APPROPRIATE AGENCY)
	Mid-term	(INSERT APPROPRIATE AGENCY)
at nearby farmer's markets and advertising farmer's market hours.	Mid-term	(INSERT APPROPRIATE AGENCY)
on of the city	Short-term	(INSERT APPROPRIATE AGENCY)
nd other area kitchens to provide food for the hungry.	Mid-term	(INSERT APPROPRIATE AGENCY)
	Mid-term	(INSERT APPROPRIATE AGENCY)
	Short-term	(INSERT APPROPRIATE AGENCY)
	Short-term	(INSERT APPROPRIATE AGENCY)
our employees.	Short-term	(INSERT APPROPRIATE AGENCY)
within each building owned by the City	Ongoing	(INSERT APPROPRIATE AGENCY)
	Mid-term	(INSERT APPROPRIATE AGENCY)

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GLOSSARY OF TERMS

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Compact Fluorescent Lightbulb (CFL): CFL's are fluorescent lamp designed to replace an incandescent lamp. Compared to general-service incandescent lamps giving the same amount of visible light, CFLs use 1/3rd to 1/5th the electrical power of incandescent lighting and can last 8 to 15 times longer (Energy Use Calculator 2015). In any energy sustainability program, proper recycling of CFL's need to be considered as they have mercury.

Dark Sky Movement: a campaign to reduce light pollution. Encourages the use of full-cutoff fixtures that cast little or no light upward in public areas and generally to encourage communities to adopt lighting regulations. A 2011 project is to establish "dark sky oasis" in suburban areas (Atkinson 2011).

Energy Audit: an assessment of the energy needs and efficiency of a building or buildings. A home energy checkup helps owners determine where their house is losing energy and money - and how such problems can be corrected to make the home more energy efficient.

Energy Service Companies (ESCO's): Are commercial or non-profit business providing a broad range of energy solutions including designs and implementation of energy savings projects, retrofitting, energy conservation, energy infrastructure outsourcing, power generation and energy supply, and risk management.

Greenhouse gas emissions (GHG): Gases that trap heat in the atmosphere are called greenhouse gases. These include carbon dioxide, methane, nitrous oxide, and fluorinated gases

Infill development: The use of land within a built-up area for further construction, often as part of a redevelopment or growth management program.

Light Emitting Diode Light Bulb (LED): LEDs are semiconductor lighting devices that produce visible light when an electrical current passed through them.

Living Wage: wages that can support a normal standard of living.

Maryland Sun (MD SUN): MD SUN is an advocacy organization that promotes solar in communities across Maryland. Their goal is to extend the benefits of solar power to every part of Maryland and to all residents. They work through grassroots organizing, policy engagement, and ratepayer advocacy. They also providing free technical assistance and other organizing support (MD SUN 2014).

Mixed use development: Pedestrian-friendly development that incorporates a variety of uses, including residential, commercial, or community uses.

APPENDIX

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Appendix A: Analysis of Existing Conditions

A.1: Data by Neighborhood Advisory Council (NAC), City of Frederick, Frederick County and the State of Maryland

	Corresponding census tracts	Total population	Land area (acres)	Total households	Annual violent crime incidents per 1,000 residents [1]	Annual property crime incidents per 1000 residents	Annual total crime incidents per 1000 residents	% Under 18	% Over 65	Number of workers 16 and older	Commute by car, truck, or van alone	%Non-Latino White	% Black
NAC 1	7512.02	5,958	1,620	2,378	2.0	20.1	22.2	29.0%	9.2%	3,071	74.6%	67.5%	12.7%
NAC 3	7507.01	5,417	2,117	1,821	1.5	10.2	11.6	38.3%	5.7%	2,616	82.0%	65.4%	18.1%
NAC 4	7508.02	3,822	1,405	1,858	1.8	22.0	23.8	17.8%	24.5%	1,874	84.2%	76.3%	12.4%
NAC 5	7505.03, 7505.04	11,656	1,253	4,609	4.3	25.7	30.0	24.1%	7.3%	6,182	63.2%	31.0%	24.4%
NAC 6	7507.02	3,176	533	1,574	8.5	30.9	39.4	16.3%	14.5%	1,702	73.7%	61.8%	18.1%
NAC 7	7508.03, 7508.01	9,301	1,175	3,821	2.2	15.4	17.5	19.5%	13.1%	5,338	73.7%	74.5%	13.6%
NAC 8	7505.05, 7505.06	10,767	1,153	3,516	4.2	16.7	20.9	29.5%	5.1%	5,734	66.2%	44.9%	14.7%
NAC 9	7651,[2] 7506	4,764	571	1,770	3.1	17.2	20.4	17.4%	15.1%	2,384	66.4%	74.9%	14.8%
NAC 10	7651, 7510.03[3]	4,991	812	3,162	4.6	14.0	18.6	23.2%	9.7%	1,604	79.2%	67.9%	16.8%
NAC 11	7501, 7502, 7503	4,413	585	2,281	7.9	21.1	29.0	11.2%	12.6%	2,883	58.0%	76.1%	13.8%
NAC 12	7722	2,007	2,718	710	12.0	25.4	37.4	28.5%	9.9%	923	72.0%	78.8%	7.5%
City	N/A	65,840	13,942	25,804	5.2	28.4	33.6	23.8%	10.8%	34,770	68.5%	55.8%	18.8%
County	N/A	236,668	426,880	86,337	1.8	12.6	14.3	24.8%	11.6%	122,513	76.7%	77.2%	8.6%
State	N/A	5,834,299	7,940,480	2,146,240	4.7	26.6	31.4	23.1%	12.7%	2,891,357	73.5%	54.1%	29.4%

[1] Crime data was aggregated using an interactive tool Neighborhood Scout www.neighborhoodscout.com as well as the Frederick County Sheriff's Office, 2015 report "News Release: Uniformed Crime Statistics," 17 April; http://www.frederickcountymd.gov/documentcenter/view/28004.

[2] Census tract 7651 covers both NAC 9 and 10, so the data is split evenly between the two NACs; U.S. Census Bureau, American Community Survey, Five Year Estimates, 2009-2013

[3] The census tract only covers part of NAC 10 so only half the data is included; U.S. Census Bureau, American Community Survey, Five Year Estimates, 2009-2013

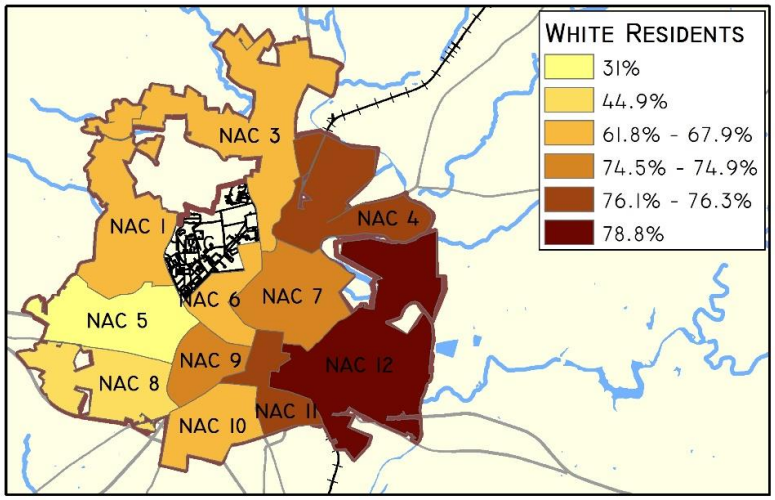
A.1: Continued

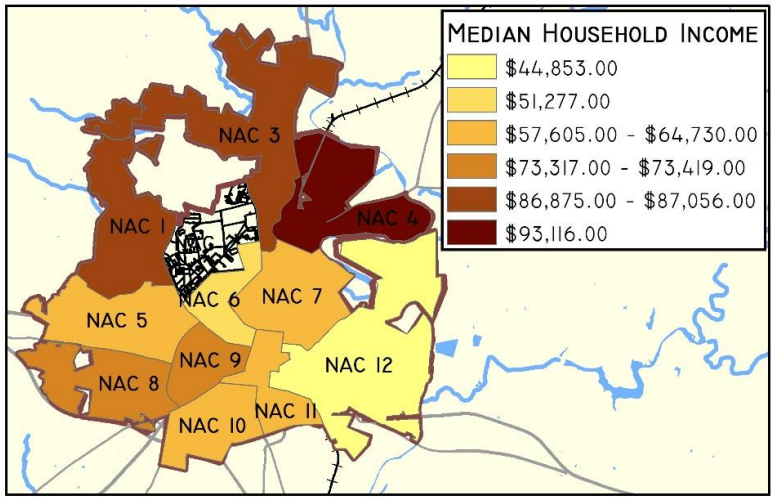
	% Latino	% Asian	% Non-White and/or Latino	Median household income	Percent below poverty in past 12 months	% Unemployed	%BA or higher	%Less than high school degree	% Owner occupied housing	Median home value	Median rent	Park area (acres)	% Park Area	Limited English household
NAC 1[4]	8.4%	8.9%	30.0%	86,875	8.3%	5.5%	47.0%	3.3%	80.0%	248,100	1,500	64	4.0%	5.70%
NAC 3	10.3%	4.2%	32.6%	87,056	5.2%	6.2%	42.6%	7.0%	100.0%	249,600	1,359	64	3.0%	1.0%
NAC 4	7.6%	1.7%	21.7%	93,116	6.3%	6.7%	54.2%	4.6%	85.8%	282,800	1,338	94	6.7%	1.9%
NAC 5	24.6%	11.3%	60.3%	57,605	12.0%	9.4%	31.1%	19.0%	35.5%	232,800	996	99	7.9%	4.6%
NAC 6	13.7%	6.1%	37.9%	51,277	11.1%	6.8%	31.8%	13.3%	38.9%	210,300	943	16	3.0%	4.8%
NAC 7	8.3%	3.1%	25.0%	64,730	6.2%	6.6%	37.6%	10.2%	59.2%	249,050	941	72	6.1%	0.4%
NAC 8	27.6%	10.1%	52.4%	73,317	15.7%	7.6%	27.8%	19.8%	59.4%	232,950	1,212	177	15.3%	6.9%
NAC 9	5.0%	5.6%	25.4%	73,419	7.6%	6.7%	40.4%	7.2%	80.1%	291,700	1,023	69	12.2%	1.8%
NAC 10	6.5%	6.7%	30.0%	59,576	12.6%	6.3%	30.0%	10.2%	30.2%	211,600	1,133	44	5.4%	1.8%
NAC 11	7.1%	0.5%	21.4%	58,202	16.3%	5.7%	39.6%	12.6%	85.4%	270,300	912	25	4.2%	0.4%
NAC 12	11.1%	1.8%	20.4%	44,853	22.1%	15.2%	19.0%	19.7%	40.4%	191,400	830	230	8.4%	0.6%
City	15.1%	6.9%	40.8%	65,652	11.2%	5.2%	36.5%	12.4%	52.4%	241,400	1,222	953	6.8%	3.0%
County	7.6%	4.1%	20.3%	84,570	6.1%	4.4%	23.2%	8.2%	75.3%	312,200	1,243	32,187	7.5%	1.6%
State	8.5%	5.7%	43.6%	73,538	9.8%	5.6%	20.1%	11.3%	67.6%	299,700	1,196			3.1%

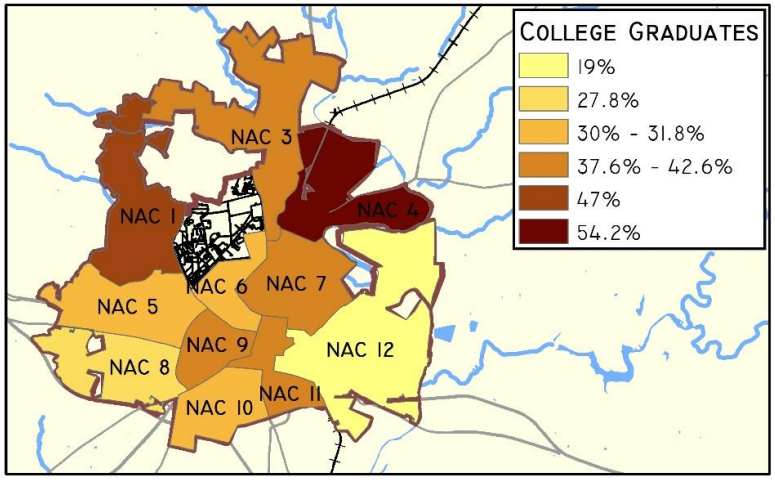
[4] Land area and park area for NACs and city from Jenny Willoughby, Sustainability Manager, City of Frederick

A.2: Maps of Neighborhood Advisory Council Data

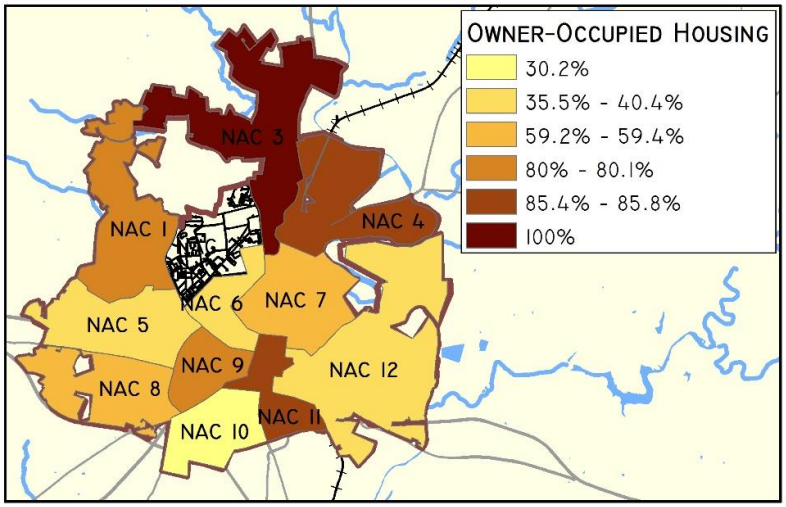
Map A1

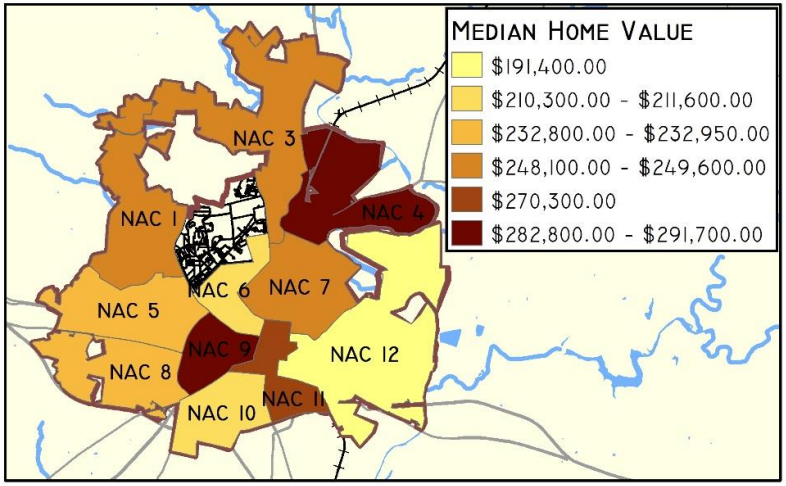




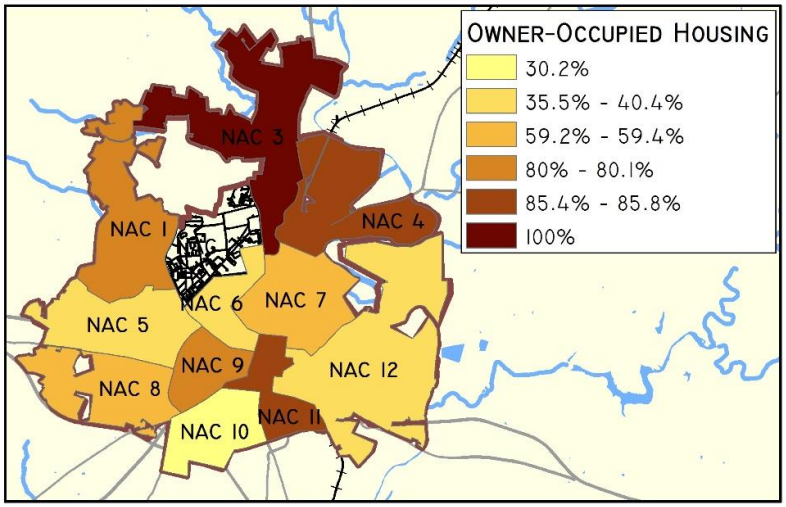


Map A2


OWNER-OCCUPIED HOUSING
30.2%
35.5% - 40.4%
59.2% - 59.4%
80% - 80.1%
85.4% - 85.8%
100%
NAC 1
NAC 3
NAC 4
NAC 5
NAC 6
NAC 7
NAC 8
NAC 9
NAC 10
NAC 11
NAC 12


MEDIAN HOME VALUE
$191,400.00
$210,300.00 - $211,600.00
$232,800.00 - $232,950.00
$248,100.00 - $249,600.00
$270,300.00
$282,800.00 - $291,700.00
NAC 1
NAC 3
NAC 4
NAC 5
NAC 6
NAC 7
NAC 8
NAC 9
NAC 10
NAC 11
NAC 12

Map A2


OWNER-OCCUPIED HOUSING
30.2%
35.5% - 40.4%
59.2% - 59.4%
80% - 80.1%
85.4% - 85.8%
100%
NAC 1
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NAC 4
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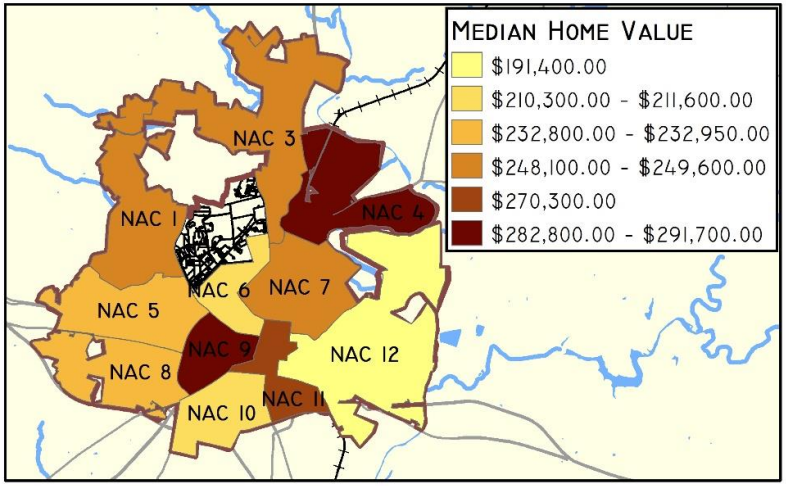
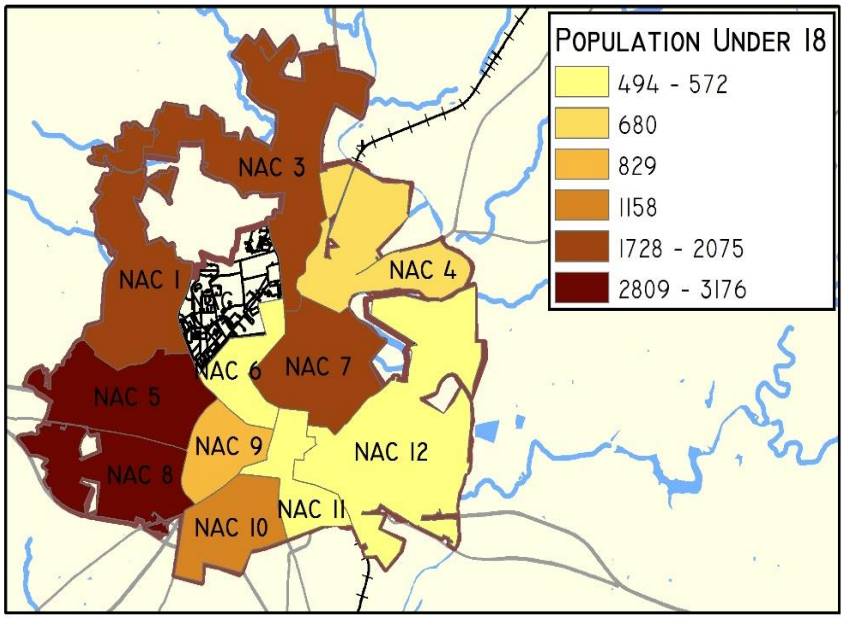
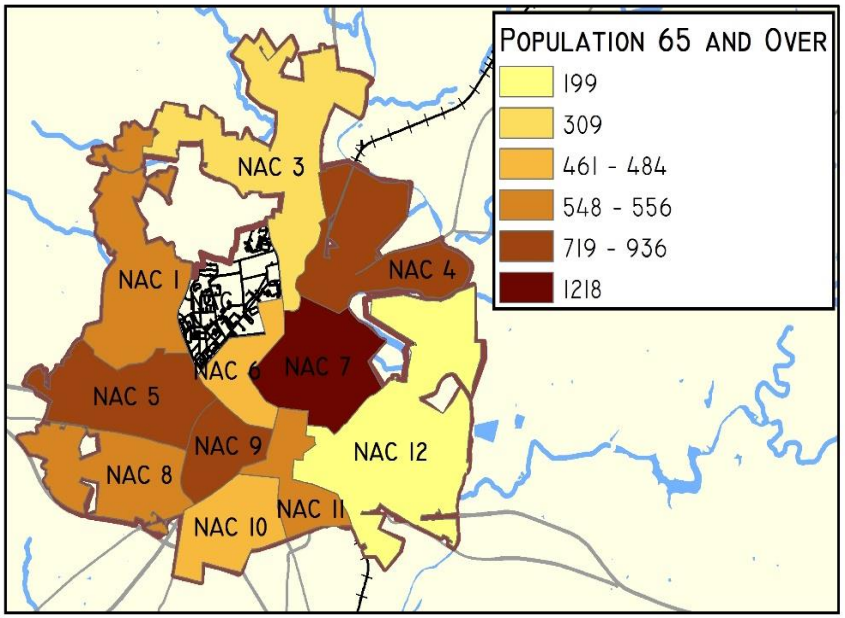
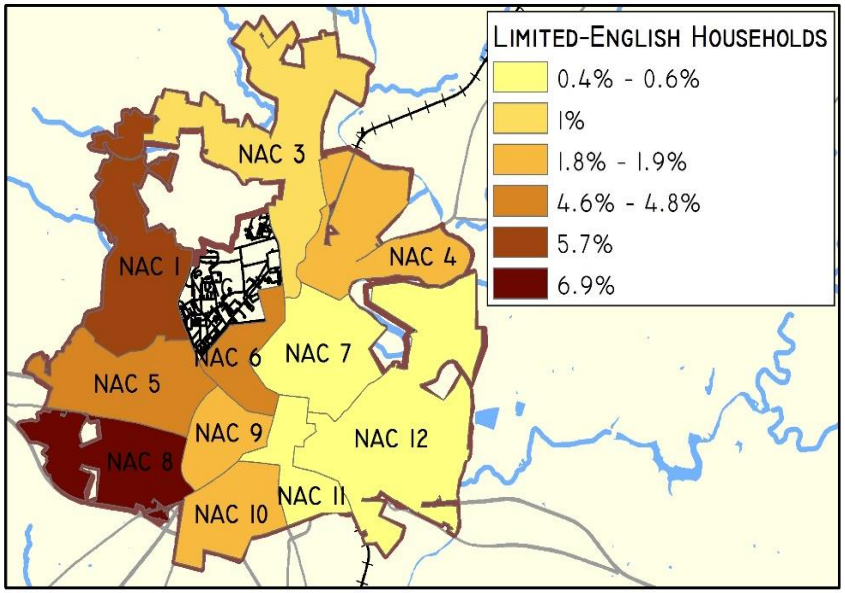
NAC 10
NAC 11
NAC 12


MEDIAN HOME VALUE
$191,400.00
$210,300.00 - $211,600.00
$232,800.00 - $232,950.00
$248,100.00 - $249,600.00
$270,300.00
$282,800.00 - $291,700.00
NAC 1
NAC 3
NAC 4
NAC 5
NAC 6
NAC 7
NAC 8
NAC 9
NAC 10
NAC 11
NAC 12

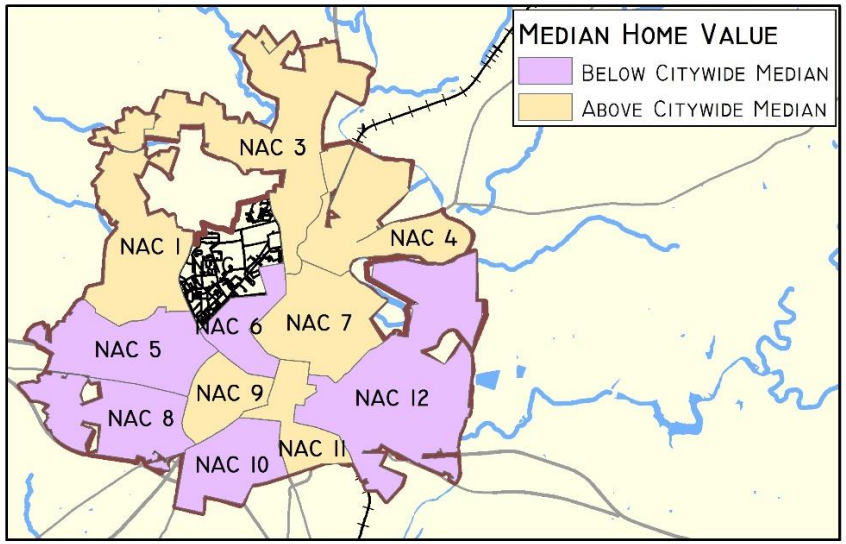
Map C

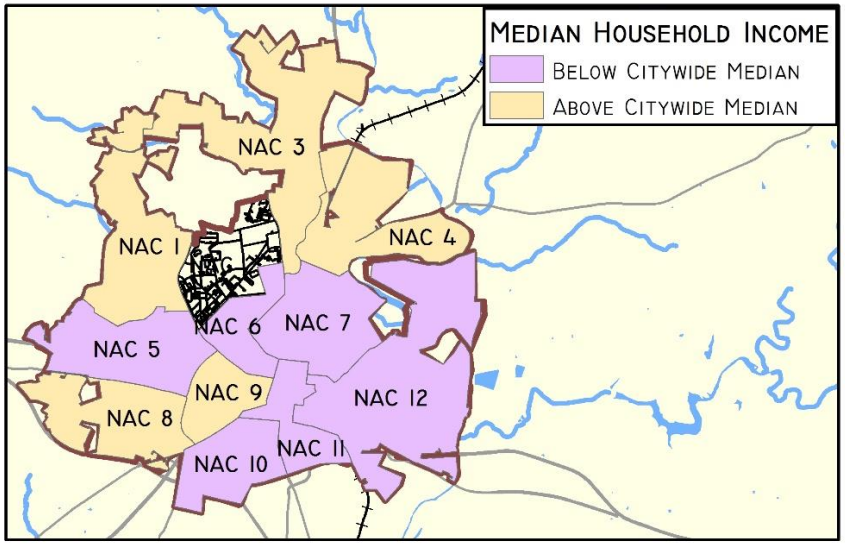

Population Under 18
494 - 572
680
829
1158
1728 - 2075
2809 - 3176
NAC 1
NAC 3
NAC 4
NAC 5
NAC 6
NAC 7
NAC 8
NAC 9
NAC 10
NAC 11
NAC 12

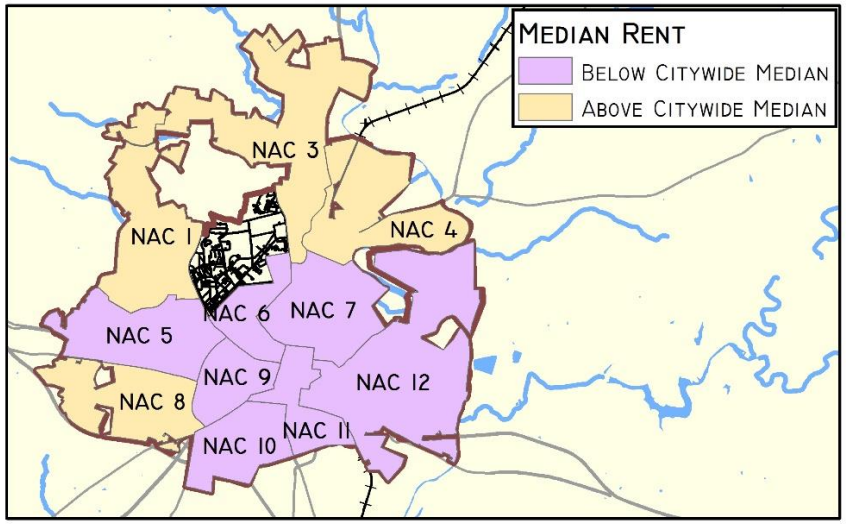

Population 65 and Over
199
309
461 - 484
548 - 556
719 - 936
1218
NAC 1
NAC 3
NAC 4
NAC 5
NAC 6
NAC 7
NAC 8
NAC 9
NAC 10
NAC 11
NAC 12

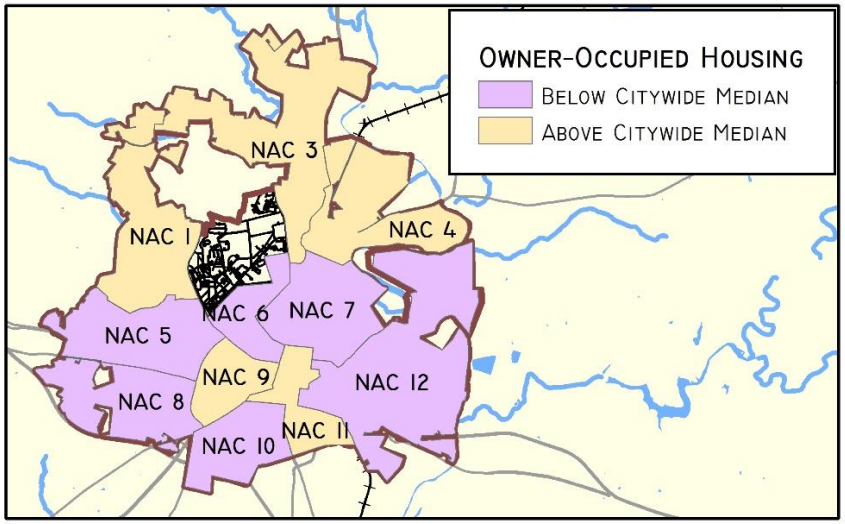

Limited-English Households
0.4% - 0.6%
1%
1.8% - 1.9%
4.6% - 4.8%
5.7%
6.9%
NAC 1
NAC 3
NAC 4
NAC 5
NAC 6
NAC 7
NAC 8
NAC 9
NAC 10
NAC 11
NAC 12

Map D

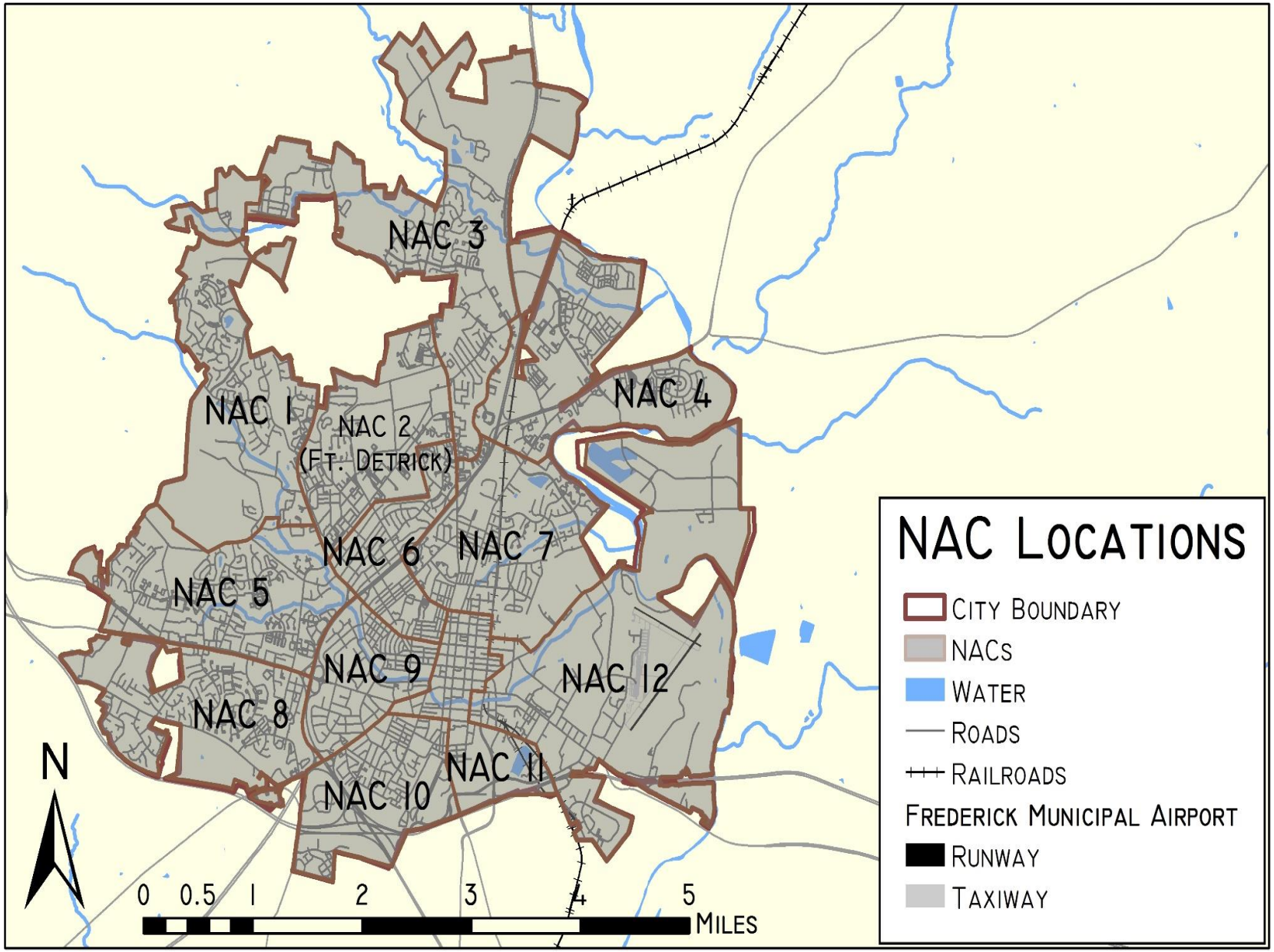

MEDIAN HOME VALUE
BELOW CITYWIDE MEDIAN
ABOVE CITYWIDE MEDIAN
NAC 1
NAC 3
NAC 4
NAC 5
NAC 6
NAC 7
NAC 8
NAC 9
NAC 10
NAC 11
NAC 12


MEDIAN HOUSEHOLD INCOME
BELOW CITYWIDE MEDIAN
ABOVE CITYWIDE MEDIAN
NAC 1
NAC 3
NAC 4
NAC 5
NAC 6
NAC 7
NAC 8
NAC 9
NAC 10
NAC 11
NAC 12


MEDIAN RENT
BELOW CITYWIDE MEDIAN
ABOVE CITYWIDE MEDIAN
NAC 1
NAC 3
NAC 4
NAC 5
NAC 6
NAC 7
NAC 8
NAC 9
NAC 10
NAC 11
NAC 12


OWNER-OCCUPIED HOUSING
BELOW CITYWIDE MEDIAN
ABOVE CITYWIDE MEDIAN
NAC 1
NAC 3
NAC 4
NAC 5
NAC 6
NAC 7
NAC 8
NAC 9
NAC 10
NAC 11
NAC 12

NAC Overview Map



Appendix B: Energy Solutions

B.1: Standards for Energy Efficient and Dark Sky Compliant Lighting

In 2002, the State of Maryland Task Force to Study Lighting Efficiency & Light Pollution in Maryland produced a guide to resources for implementation on environmentally friendly, energy efficient lighting that reduces light pollution and glare. Below are a few of many recommended the following as guides to implementing code light specifications for cities:

- Outdoor Lighting Code Handbook, Version 1.11, January 2001, International Dark Sky Association (IDA)
- Guide on the Limitation of the Effects of Obtrusive Light from Outdoor Lighting Installations, CIE Report TC-5. 12, CIE
- Light Trespass: Research, Results and Recommendations, TM-11-00, IESNA

The International Dark Sky Association (IDA) - a research and advocacy against light pollution- also provides logistical assistance to governments needing expertise on implementation of dark sky ordinances or code changes.

B.2: Dripping Springs, Texas

Forming an International Dark Sky Community-
A formerly sleepy ranching town, the city experienced massive growth, seeing its population increase by some 72 percent between 2000 and 2010 (International Dark-Sky Association 2014). Alarmed that future development could bring light pollution, the city created a dark sky ordinance and eventually became one of 8 dark sky communities in the United States. The city plus the 30,000 citizens in neighboring unincorporated areas' implemented a strategy that balanced lighting, safety, and growth. The city has worked diligently to help local businesses and residents follow and to educate on dark sky lighting standards for the community (International Dark-Sky Association 2014). The results are reduced glare, light trespass, and sky glow while increasing safety, visibility, area attractiveness, and protection of dark night skies (International Dark-Sky Association 2014).

Appendix C: Waste/Recycling

Takoma Park Food Waste Collection Program Case Study

"The Food Waste Collection Program is a curbside collection service provided to eligible Takoma Park residents at no cost. Collected food waste is then converted into compost. The Food Waste Collection Program makes it easy for Takoma Park residents to dispose of household food waste in a sustainable fashion.

The initial pilot program started in mid-February of 2013. According to data from the pilot program almost 30% of food waste that was disposed of in regular trash (which is incinerated) could have been composted.

How it Works
Participants will receive a five-gallon plastic bucket with a tight sealing lid and a supply of compostable bin liners. Food waste is then put into the buckets that are set on the curb and picked up by the Public Works Department. Curbside collection takes place once a week. Participants should have their containers at the curb by 6:00 AM on their collection day.

Additional compostable bin liners are available from local stores. If an alternative to compostable bags is desired participants can use paper bags or no bag at all. Frequent cleaning of containers is necessary to keep odors down.

Participants in the Food Waste Collection Program can get free compost! In an effort to encourage organic lawn care in Takoma Park participants are eligible to receive up to five buckets of free compost. Compost is primarily available in the spring and summer.

What Can Be Collected as Food Waste in Takoma Park
The following items can be placed into food waste collection buckets in Takoma Park:

- fruit and vegetable scraps (fresh or cooked)
- meat, fish, shellfish (including bones)
- dairy products (cheese, butter, ice cream, etc.)
- bread, pasta, rice, grains, cereal, baked goods, etc.
- nuts, beans, seeds (including shells/hulls)
- coffee grounds, filters, tea bags (no foil or foil-backed products)
- paper products (paper towels, napkins, & paper plates)
- pizza boxes (remove non-food items)
- chopsticks and popsicle sticks

Food Waste Collection Program Schedule

- Households with Tuesday, Wednesday or Thursday trash collection: Food waste is collected on Monday mornings. Households with Friday trash collection: Food waste is collected on Friday mornings."**Invalid source specified.**

Appendix D: Economic Development

D.1: City of Frederick Capital Improvement Projects, FY 2015-20

	City Share of Project Funding Required	**City Share of Project Funding Approved**
General Fund Projects (roads, parks, city facilities)	106,310,442	87,309,583

Water and Sewer	219,116,382	167,111,382
Airport Fund	4,260,103	1,851,603
Parking Facilities Fund	31,761,715	2,115,864
Storm water Fund	29,592,332	25,592,332
Total	391,040,974	283,980,764

D.2: Job Counts by NAICS Industry Sector[5]

Job Counts by NAICS Industry Sector

	2011	
	Count	Share
Total Primary Jobs	41,297	100.0%
Agriculture, Forestry, Fishing and Hunting	129	0.3%
Mining, Quarrying, and Oil and Gas Extraction	36	0.1%
Utilities	131	0.3%
Construction	1,431	3.5%
Manufacturing	1,287	3.1%
Wholesale Trade	991	2.4%
Retail Trade	4,349	10.5%
Transportation and Warehousing	262	0.6%
Information	798	1.9%
Finance and Insurance	4,332	10.5%
Real Estate and Rental and Leasing	354	0.9%
Professional, Scientific, and Technical Services	3,807	9.2%
Management of Companies and Enterprises	208	0.5%
Administration & Support, Waste Management and Remediation	1,605	3.9%
Educational Services	5,789	14.0%
Health Care and Social Assistance	6,865	16.6%
Arts, Entertainment, and Recreation	257	0.6%
Accommodation and Food Services	2,853	6.9%
Other Services (excluding Public Administration)	1,627	3.9%
Public Administration	4,186	10.1%

[5] (U.S. Census Bureau. 2015)

D.3: Snapshot of Selected Industries in Frederick

(On the Map: Job Counts by NAICS Industry Sector, City of Frederick 2015)

Type of Business	**Number of firms**	**Types of companies**	**Employment**
Biotechnology, Biomedical, IT Software and Computer Services	37	Clinical research, lab equipment, pharmaceutical manufacturing	9.2%
Construction, Contracting and Building	17	General contracting, roofing, plumbing, HVAC, glass installation	3.5%
Manufacturing, Processing and Distribution	16	Bricks, mined minerals, roasted coffee, HVAC equipment, voltage systems, brewery	3.1%
Waste Management and Recycling	7	Business recycling, waste management, electronic waste recycling, residential junk removal	3.9%

Appendix E: Transportation

The evaluation standards **are divided into several key categories for the Green Fleet Award, given by 100 Best Fleets.**

1. Fleet Composition - This category compares your current fleet composition of conventional fueled (gas & diesel) vehicles versus hybrid, electric, and alternative fuels etc. The data submitted only applies to the current mix of your fleet at the time of application, not projected purchases.

2. Fuel & Emissions - The fuels criteria determines your use of renewable and alternative sources of energy. It compares your total use of conventional versus renewable fuels such as BioDiesel & Ethanol, and non-renewable fuels such as propane and compressed natural gas. The emissions criteria evaluates what your fleet has done to cleanup your current inventory of on and off road diesel equipment.

3. Policy & Planning - An integral part of any green fleet plan is not necessarily what you do today, but also what you have planned for the future. Green fleet sustainability is the process in which you plan for the future environmental role of your fleet. Will you continue to budget and

purchase green technologies, or will you stop your current green efforts?

4. Fleet Utilization - Involves not only how your fleet is used, but also how you determine what size vehicle is appropriate for a given job classification. Purchasing oversized vehicles and engines when a smaller vehicle would suffice, needlessly adds unnecessary pollutants into the atmosphere while increasing your fuel usage. Other programs such as loan pools and car sharing programs are also evaluated.

5. Education - Knowing what new technologies are in the marketplace is an important aspect to any green fleet manager. This standard requires each fleet manager to stay informed about green fleet news. Your attendance in green seminars and subscriptions to green publications will keep you appraised on what's new.

6. Executive & Employee Involvement - No longer is the fleet manager considered some abstract object sitting in the last row watching others decide. The fleet manager of today is not only a manager, but also an educator. It is the duty of the fleet manager to educate the executive staff and/or political leaders of the advantages of a green fleet, new & available technologies, and the costs associated with them. Employee involvement outlines your efforts to keep the fleet employees informed about the direction of your green fleet program.

7. Supporting Programs - Is a wide variety of other initiatives that includes: applying for grants, recycling programs, parts purchasing habits, and maintenance facility improvements.

Appendix F: Food/Nutrition

F.1: Food Deserts and Grocery Stores

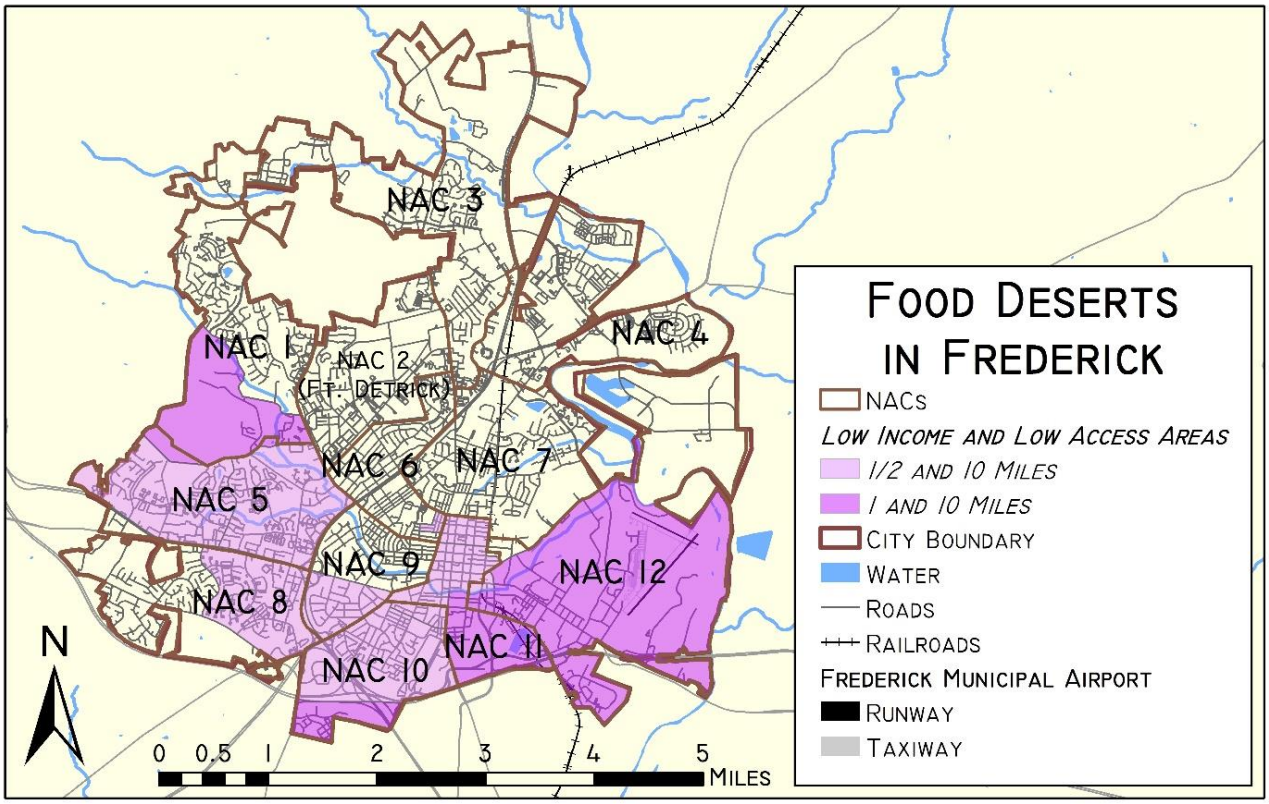
The City of Frederick, has a number of food deserts concentrated in its urban core. The southern part of downtown Frederick is classified by the USDA's Food Atlas as a food desert - meaning citizens there are lack easily accessible nutritious food. Eastern Frederick (census tract 72200) is classified as a classic food desert as a low income tract with no major food access within 1 mile.

Downtown Frederick is even more restricted with the highest lack of food being concentrated in NAC 11 where, according to the USDA food access atlas 1,712 households have limited access to fresh food due to a reliance on public transportation or shared vehicles and no large grocery within walking distance.

A technical report, *Business Performance in Walkable Shopping Areas*, indicates that a neighborhood shopping area of about 50,000 square feet, of which about 30,000 square feet are dedicated to supermarket, requires about 2,500 to 3,300 households to support it. According to recent census data, NAC 11 and NAC 12 alone have 2,991 households with nearly 60% living without a vehicle-therefore spending on walkable food access. To truly alleviate food access for this population – a new grocery store or creation of one of the existing farmers markets into a

permanent year around market in this critical area must be explored in the food sustainability plan.

Food sensitivity and lack of proper nutrition is also typically connected to poverty. The city of Frederick currently has a citywide 11% poverty rate with NAC 12 the highest at 22.1% and NACs 11, 10, 8, and 5 all experiencing above average poverty. This confirms an interview conducted with the Frederick Community Action Agency- where they noted that the Golden Mile neighborhood along NACs 8 and 5- use a food bank they have set up in the neighborhood. The golden mile and NACs 8 and 5 may be underrepresented by the USDA and census data used to target food sensitive households due to the high immigrant population in the neighborhood. Therefore, it is recommended that further research on poverty and food access be directed at the golden mile neighborhood. All food policies- from permaculture forests to community gardens- must focus on NACs 12, 11, 19, 7, and 5 first when trying to bring healthy food to the city.



F.2: Permaculture Forest

Herbert Girardet's Schumacher Briefing, Creating Sustainable Cities, describes the sustainable city as a place "organized so as to enable all its citizens to meet their own needs and to enhance their well-being without damaging the natural world or endangering the living conditions of other people, now or in the future" (Holstein 2013). Part of that is fostering education about proper nutrition and providing access to healthy food.

The 2.6-mile Trolley Trail in the City of College Park and the 7 acre Jefferson Park in Seattle are part of a sustainable movement to put edible trees and plants in public spaces (Leschin-Hoar

2012). The city uses public land to plant food, herbs, and other beneficial plants. Citizens are then invited to consume the food and herbs available. This provides food security, education to citizens about nutrition, and is a part of beautification of cities parks and landscapes.

These new spaces are also a part of a system of landscape design called permaculture- which allows edible plants to survive as part of an ecosystem - needing less pesticides and maintenance. This regenerative design process of city parks provides the city with a more environmentally sustainable way of beautification that works with the local climate, wildlife, and ecology.

F.3: Funding Sources for Food and Nutrition Access

Below is a list of funding sources for food and nutrition access that the city of Frederick can apply for beyond typical WIC, SNAP, and other low-income assistance food programs.

USDA Grants

- **Farmers Market Promotion Program (FMPP) -** grant program to promote farmer's markets and help in marketing.
- **Farmers Market Nutrition Program (FMNP):** Helps expand access and knowledge of farmer's markets to WIC participants
- **Senior Farmer's Market Nutrition Program (SFMNP):** Helps create new farmer's markets and provide outreach for existing ones to seniors
- **Healthy Urban Food Enterprise Development Center** grant program: establishes and supports a Healthy Urban Food Enterprise Development Center to increase access to healthy, affordable foods, including locally produced agricultural products, to underserved communities.
- **Community Food Projects Competitive Grants Program (CFPCGP):** Supports a broad array of programs from GIS research to establishment of farmer's markets, cooperatives, marketing programs, and market gardens for communities.
- **Food Insecurity Nutrition Incentives (FINI) Program:** provides grants on a competitive basis to projects that help low-income consumers participating in the Supplemental Nutrition Assistance Program (SNAP) purchase more fresh fruits and vegetables through cash incentives that increase their purchasing power at locations like farmers markets, producers and low-income consumers.
- **National Sustainable Agriculture Coalition's Farmers Market and Local Food Promotion Program and Grants:** A grant program for promoting local food and helping farmer's markets thrive (National Sustainable Agriculture Coalition 2015).