



CHAPTER 4

ENVIRONMENTAL INTEGRITY

CHAPTER AT A GLANCE

<input type="checkbox"/> Introduction	4-02
<input type="checkbox"/> Clean Water	4-03
<input type="checkbox"/> Clean Air + Energy	4-05
<input type="checkbox"/> Healthy Neighborhoods	4-07
<input type="checkbox"/> Land Conservation	4-12
<input type="checkbox"/> Eco-Education	4-15
<input type="checkbox"/> Reduce, Reuse, Recycle	4-18
<input type="checkbox"/> Hazard Mitigation	4-20
<input type="checkbox"/> Recommendations	4-21

CHAPTER 4

ENVIRONMENTAL INTEGRITY

Dubuque has always been closely tied to its bluffs, rolling hills, prairies, and waterways. In 2006, the City of Dubuque made a strong commitment to the environment and all elements of sustainability, as outlined in the Sustainable Dubuque Plan. That commitment has remained strong, and is a key component to this Imagine Dubuque Comprehensive Plan.

Introduction

The Sustainable Dubuque model outlines four key principles of environmental integrity:

- 1 Clean Water
- 2 Healthy Air
- 3 Native Plants and Animals
- 4 Reasonable Mobility



These principles were front and center at the Imagine Dubuque Environmental Integrity Workshop held at the University of Dubuque on February 21st, 2017 and in a related quick poll. Comments, ideas and suggestions shared by residents during this and other outreach efforts indicate that residents have a strong environmental appreciation and ethic. This chapter focuses on key environmental issues raised by residents during the Imagine Dubuque planning process. Issues related to Reasonable Mobility are addressed in the Transportation and Mobility Chapter.



▲ Environmental Integrity Workshop

□ What are Dubuque's greatest environmental assets?

To help inform and guide the Environmental Integrity Workshop, a preceding 'Working Group Session' took place on February 15th, 2017 at Loras College. Smart phone polls were conducted to gauge the greatest environmental assets for Dubuque. The results of which are showcased via the colorful wordcloud below.



Environmental Policy

Urban development and agricultural practices can have a significant impact on water quality.

Create partnerships with private landowners, developers, citizens, and other local governments to identify and develop potential control measures, promote expanded infiltration through use of deep-rooted native plantings, and ensure that new development meets applicable standards for water quality.



▲ DNR conducts fish assessment in Lower Bee Branch | Image Credit: City of Dubuque

Clean Water

Dubuque primarily drains into two watersheds, generally divided by Asbury Road; (1) Bee Branch Watershed to the north and (2) Catfish Creek Watershed to the south. Improvement projects are well underway to subdue flooding and improve water quality. Areas at the far northern limits of the City drain into the Little Maquoketa River Watershed (see illustration on page 4-4). These watersheds drain into the Mississippi River. Efforts noted below to better manage stormwater locally will also help to enhance overall river water quality.

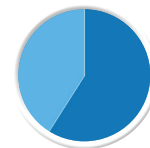
Stormwater Management: Bee Branch Watershed

The Bee Branch Watershed lies completely within one of Dubuque's oldest and most dense neighborhoods. Six Presidential Disaster Declarations, resulting in \$70 million in damages, occurred between 1999 and 2011. To address this issue, the City initiated the Bee Branch Watershed Flood Mitigation Project, a multifaceted approach that incorporates permeable pavement, two upstream retention basins, daylighting of Bee Branch Creek, and resiliency efforts of storm drains.

Dubuque constructed 80 green alleys between 2014 and August of 2017. A green alley consists of permeable pavers that allow for ground infiltration of water after storm events. The project aims to complete 240 total green alley conversions by 2038. The total cost of the alleys is estimated at \$57.4 million, funded in part by State, Federal, and local match dollars. **The impact of the green alleys is a reduction of stormwater runoff within the Bee Branch Watershed by up to 80%.** All told, the Bee Branch project goes well beyond stormwater management, and will serve as a neighborhood catalyst, bringing open space, improved quality of life, restored habitat, and incentives for reinvestment to North End and Downtown neighborhoods.



ENVIRONMENTAL INTEGRITY QUICK POLL:
Q: How can Dubuque as a community ensure clean water?



59%

A: Implement innovative stormwater management efforts and promote pesticide-free lawns and parks.

The top two 'clean water' priorities, as ranked by the community, were to (1) implement innovative stormwater management efforts like rainwater catchment systems, permeable pavers and raingardens (98 votes, 59%) and (2) improve water quality by not using pesticides on lawns or parks (82 votes, 49%).

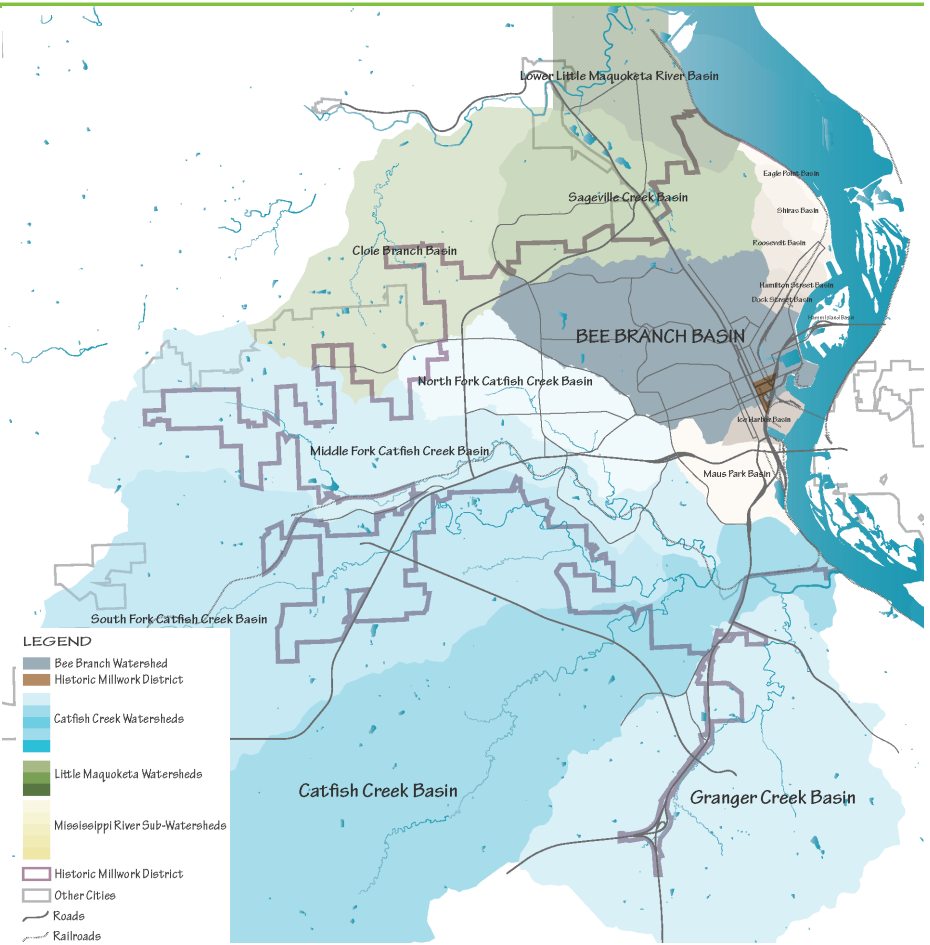


“

Clean water will only happen through partnerships and within the current legislative framework of watershed management authorities.

- Resident idea submitted online

”



Creek Protection: Catfish Creek Watershed

While the Bee Branch Watershed encompasses a predominantly urban environment, the Catfish Creek Watershed covers urban, suburban, and large swaths of rural and agricultural land. Protecting surface water quality from agricultural practices and over-development of sensitive ecological areas are priorities, as outlined by the Catfish Creek Watershed Management Authority.

In 2014, the State of Iowa Water Resource Restoration Sponsored Project program granted \$1.4 million for improvements in the Catfish Creek Watershed. The Catfish Creek Watershed Management Authority will use the funding as public “match” dollars for best management practices such as bio-retention, rain gardens, vegetated swales, soil quality restoration, rural sediment discharge, and wetland enhancements/establishments.

Environmental Policy

The Catfish Creek Watershed Management Plan identifies 35 Green Infrastructure Protection Areas (as highlighted in the Environmental Factors Map on page 4-13) in which protection, restoration, or conservation/low impact designed development is recommended. These areas are primarily undeveloped and are important to the green infrastructure network of the Catfish Creek Watershed or situated in environmentally sensitive areas.


Partner with other agencies and property owners to implement the Catfish Creek Watershed Management Plan and apply a higher level of scrutiny/mitigation requirements. Mitigation may take several forms including wetland creation, restoration, enhancement, and, under some circumstances, preservation.





Clean Air + Energy

Climate Action & Resiliency Plan

The Dubuque Community Climate Action & Resiliency Plan establishes a goal of 50% reduction of greenhouse gas emissions to 2003 levels by the year 2030. The plan identifies contributors to greenhouse gases in Dubuque and sets forth an impact reduction target to achieve the 50% goal. Important to this effort is Dubuque, along with its partners, should regularly update the 50% by 2030 Community Climate Action & Resiliency Plan to stay current on best practices in greenhouse gas mitigation, climate adaptation, and resiliency. Reduction policy areas are summarized in the table below.

The **Dubuque Energy District** is an initiative in-progress. It is locally-led organization whose mission is to provide leadership in implementing clean energy efficiency measures and supporting renewable energy locally. Supporting this initiative will be important to Dubuque's sustainability initiatives. Harnessing clean energy provides communities with environmental and economic benefits.

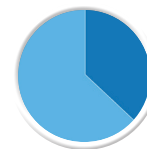


Policy Area	Objectives	Examples
Waste Reduction and Utilization 	Reduce/eliminate methane gas emission and divert organic materials from landfill.	Capturing and burning methane from decomposing organics at the Dubuque Metropolitan Area Solid Waste Agency landfill.
Local Energy and Renewables 	Evaluate and implement cost-effective renewable energy sources.	Solar photovoltaic arrays could generate a significant amount of energy in Dubuque, particularly at large commercial and industrial facilities. Hydroelectric generation at the Mississippi River dam is another strong potential.
Transportation 	Improve travel efficiency and enhance non-auto modes of travel such as public transit and walking/biking.	Enhance efficiency through re-routing trucks via the new Southwest Arterial, install additional roundabouts to enhance traffic flow, and optimize Jule transit service.
Built Environment 	Promote efficient lighting and green building techniques. Encourage mixed-use, walkable development in appropriate locations.	The Petal Project provides organizations with technical assistance to improve the environment and their bottom line. Certification criteria are related to staff education, energy conservation, pollution prevention, waste reduction, and water conservation.



ENVIRONMENTAL INTEGRITY QUICK POLL:

Q: How should we actively protect the environment and advance green policies?



37%

A: Education, outreach campaigns and exhibits focused on green practices, energy savings, and waste reduction.

Educating the community on green practices and implementing an outreach campaign to empower citizens, business green practices, and energy savings was a top overarching priority throughout the quick poll (61 votes/37%).



ALLIANT ENERGY®

..... ■ In 2017, Alliant Energy began construction of Iowa's largest solar array in Dubuque. The 5-megawatt array will power the equivalent of 727 homes in Dubuque.



..... ■ The Petal Project provides assistance in partnership with the Dubuque Metropolitan Area Solid Waste Agency, East Central Inter-governmental Association, Iowa Department of Economic Development, and Iowa Department of Natural Resources Pollution Prevention Services Team.



Mobile Air Monitoring

During plan outreach, some residents expressed a desire to implement mobile air monitoring technology. The emerging technology allows anyone with a smartphone to measure the particulate matter in the air by connecting to a handheld sensor device. Studies show that air pollutants are highly-localized, and aggregating one air quality figure for an entire city may not be the most effective way of understanding the problem. With mobile monitoring, localized, toxic hot spots could become public knowledge, and with this awareness, targeted policies could alleviate the pollution.



Environmental Policy

CLE4R (Clean Air in the River Valley) is a collaborative between the University of Iowa, City of Dubuque, and Dubuque-area partners working to improve air quality. The organization, through support from the Environmental Protection Agency, uses environmental education workshops, technology such as mobile air quality monitoring, partnerships, and planning to achieve its goals. CLE4R holds trainings on how to use mobile air quality technology and distributes sensors to their partners.

Lead by example! Showcase and celebrate sustainability efforts of resident-scientists, businesses, and government to raise awareness of environmental issues and positive initiatives to target air quality policy.



◀ Ecology discussion underway at the Environmental Integrity Workshop .



Healthy Neighborhoods

A “healthy neighborhood” is a place where it makes economic sense for people to invest their time, energy, and money. They support environmentally safe homes, provide opportunities to commune with nature, and provide access to public spaces that restore physical and mental health. In recent years, Dubuque’s Washington Neighborhood has seen “healthy neighborhood” revitalization efforts and street treatments such as green alleys (as shown above).

The City of Dubuque developed an Integrated Pest Management program to help reduce chemical use in outdoor spaces and facilities, part of an overall effort to create a more Sustainable Dubuque. Implementation of the Integrated Pet Management program is an ongoing process and staff continue to explore the most effective and least toxic method for controlling pests. The City has designated a number of Pesticide Free Parks. These parks were chosen because they are located throughout the Dubuque community, giving all residents access to pesticide-free areas that can be managed without the use of chemicals.

Environmental Policy

Strengthen and form additional partnerships to help the City revitalize older neighborhoods and improve quality of life via the CHANGE (Comprehensive Housing Activities for Neighborhood Growth & Enrichment) program. The CHANGE program plans to spend \$19 million by 2021 to improve 739 housing units and spur tens of millions of dollars in private investment.

SPOTLIGHT ON EQUITY

EQUITABLE
HEALTHY HOMES

Dubuque’s housing stock is older, and, in some cases, safety interventions are necessary. Since 1994, the City has facilitated lead remediation in 1,151 (8%) of 14,413 residential properties built prior to 1978. Most of Dubuque’s housing (83%) was built prior to 1978, when lead paint was no longer allowed for residential use. Part of **Dubuque’s Comprehensive Housing Activities for Neighborhood Growth & Enrichment (CHANGE)** program assists low- and moderate-income households with mitigating lead and other home/health safety hazards.

Dubuque’s Lead Hazard Control & Healthy Homes Program allocates money to households in need, particularly those with young children who are most vulnerable to environmental hazards. The City aims to assist approximately 129 units within Dubuque city limits using \$3.2 million of U.S. Department of Housing and Urban Development funding over three years.

The **Bee Branch Healthy Homes initiative** has also allotted \$8.4 million in forgivable loans to flood-proof 320 flood-prone houses, mitigating mold growth, structural issues, and electrical hazards. A Healthy Home Advocate works with individuals and families to develop a resilience plan for each home.



Urban Forestry

The benefits of urban forests are multifold: traffic calming, clean air, stormwater management, reduced temperatures, and induced exercise to name a few. The City completed an Urban Forest Evaluation in 2011 and adopted a stand-alone tree ordinance in 2015. Currently, the City is working to develop a Comprehensive Tree Management Plan.

City of Dubuque Urban Forestry Goals

- ☐ A species diversity policy with protocol that no more than 10% of any one species is planted.
- ☐ Develop 'trees species planting lists' for replacement of trees in existing narrow tree lawns that are 5' to 8' in width.
- ☐ Remove some parking spaces in some of the narrow tree lawns (less than 5' wide) to accommodate intermittent new tree plantings.
- ☐ Implement a planting program that replaces trees at 110% the rate of removal.
- ☐ Closely monitor park trees for the management of diseases, such as Oak Wilt and Emerald Ash Borer, to limit their spread.

DUBUQUE



Speak for the Trees!

Dubuque Trees Forever, a non-profit that builds community while promoting stewardship, has recently partnered with the Forestry division of the Leisure Services Department. Dubuque Trees Forever hosts community planting events that spread local knowledge of how to properly site and plant trees and the benefits of tree plantings such as shade coverage for energy efficiency and clustered street trees to reduce driving speeds. The organization also provides resources on tree planting, tree maintenance, and attracting native pollinators.



THE EMERALD ASH BORER

No bigger than a penny, but man can these little guys wreak havoc! The Emerald Ash Borer, an invasive beetle from Asia, is threatening Dubuque's ash tree population. The City's Leisure Services Department prepared and is implementing the Emerald Ash Borer Readiness Plan, which provides an action plan and cost estimate for the treatment, removal, and replacement of Ash street trees in Dubuque, a quarter of the street tree population. Once the near-term threat of Emerald Ash Borer is addressed, the City can shift its focus to address more policy goals via the Comprehensive Tree Management Plan.

Beautify Dubuque by planting a diversity of trees to replace dying trees. Maintain trees newly planted.

- Idea voiced by a community member at the Environmental Integrity Workshop @ The University of Dubuque on 02/21/17

Native Plants for Pollinators

Pollination is the process by which animals such as birds, bees, bats, butterflies, or simply the wind, transfer pollen between flowers, fruits, vegetables, and plants producing viable seeds for a plant species. Unfortunately, many pollinator species are threatened due to loss of habitat and the introduction of invasive species, putting the plants we depend on for food, clothes, and medicine at risk.

Environmental Policy

According to the Pollinator Partnership and the North American Pollinator Protection Campaign, Dubuque lies in the prairie parkland ecological region. The campaign provides planting schemes for landowners in different development contexts (i.e. households, farmlands, and public lands). Gently rolling plains with steep bluffs in the valleys, or rounded hills are indicative of the prairie parkland region.

The use of native planting schemes, particularly around stormwater management areas, should be encouraged for both public and private projects such as in the Bee Branch Creek Restoration Project shown below.

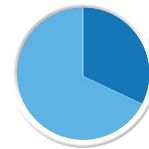


▲ Native Plantings adjacent to the Bee Branch



ENVIRONMENTAL INTEGRITY QUICK POLL:

Q: How should we actively protect the environment, advance green policies?



32%

A: Increase native plantings

Among all respondents, 32% (52 Individuals) reported that they would like to see more native plantings (i.e. pollinator habitats, etc.) when asked about ways to advance green policy.

Native prairie wildflowers, which include New England purple asters as shown in the photo above, attract butterflies.

“

Bring in a local group like ‘Backyard Abundance’ to teach about gardening, herbs, sustainable yard, etc.

- Community member at Social + Cultural Vibrancy Workshop @ The Smokestack on 04/19/17

”

Edible Landscaping

Landscapes such as communal herb gardens, community orchards, or edible berries are increasingly common in today's urban public spaces. Edible landscapes achieve decorative and aesthetic design goals while offering a source of nutritional food for consumption. The benefits of edible landscaping are multifold, and cultivating and harvesting such landscapes in public spaces inspires the community and creates a strong sense of place. Edible plants include fruit trees, berries, lettuces, and herbs.

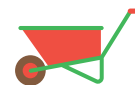


EDIBLE LANDSCAPING 101



Avoid Chemicals

Pesticides, herbicides and chemical fertilizers can contaminate food.



Compost

Composting helps plants flourish and eliminates the need for fertilizers.



Rotate Crops

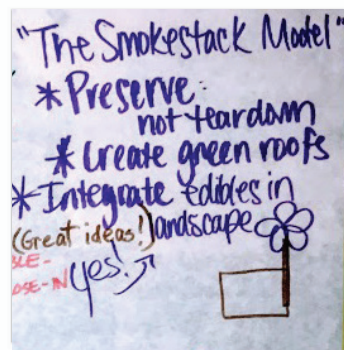
Changing where you plant your crops each year helps prevent diseases.



Mulch

Mulching reduces weeds, helps prevent disease and conserves water.

Source: www.landscapeeast.com



Ideas shared at the Social and Cultural Vibrancy Workshop, held at The Smokestack on April 19th, showcase the desire for edible landscaping and green roofs.

Environmental Policy

Through city ordinance, the City of Madison, Wisconsin permits planting edible landscapes on all public property. The permit application requires a simple diagram of the planting, information of what will be planted, and who will tend to it. All produce grown becomes available to the public for picking.

Encourage edible plantings in appropriate public spaces and look to groups such as the Dubuque Community Garden Coalition to educate residents, design, and maintain plantings.

Seed Swap Library

Carnegie-Stout Public Library offers a seed lending library, Carnegie "Sprout." Seed libraries are a relatively easy way to share resources among home gardeners (or aspiring gardeners) and build a local knowledge base of growing conditions. Saving seeds from plants can be tricky depending on the variety, spacing, and season, so a seed swap library typically supplements its supply of seeds through commercial donations. Partnerships with urban farming groups such as Convivium Urban Farmstead could allow the seed lending library to sustain itself. The Seed Savers Exchange, the group who helped donate to start Carnegie "Sprout," provides resources for individual and community seed libraries.



Source: Carnegie Stout Library Facebook Page

▼ Washington Neighborhood Community Garden



SPOTLIGHT ON LIVABILITY

CONTINUE SUCCESS WITH COMMUNITY GARDENS



The Dubuque Community Garden Coalition inventories the variety of community gardens in Dubuque, connects growers with food pantries, and provides resources for how to start a new community garden in your neighborhood. Dubuque offers different kinds of community gardens: (1) individual plot, (2) educational, and (3) communal. These successes can be built upon to create a self-perpetuating local food economy of growers, distributors, and consumers.

Apartment dwellers expressed desire to participate in native plantings and community gardens in the community. Options for renters should be explored, including community gardens wherein individuals can secure a plot/section of land.



▲ Community Gardens operated by non-profits have successfully partnered with food pantries in Dubuque to make local, fresh food more accessible.

Land Conservation

Green Infrastructure Protection Areas

Dubuque's natural setting along the Mississippi River is characterized by bluff sand deep-cut river valleys left largely undisturbed by the last Ice Age, a characteristic of the Driftless Area of the Upper Midwest. Many of the bluffs and areas with more topographical features remain relatively undeveloped. Protecting natural areas and areas of productive agriculture will not only lead to ecological benefits but offers potential for eco-tourism. Doing so in a manner that educates the public will help foster stewardship for future generations. In workshops, focus groups, and online comments, community members expressed a desire to conserve areas near water trails and canoe launches to create serene places and viewpoints to watch migratory birds.

Environmental Factors Map

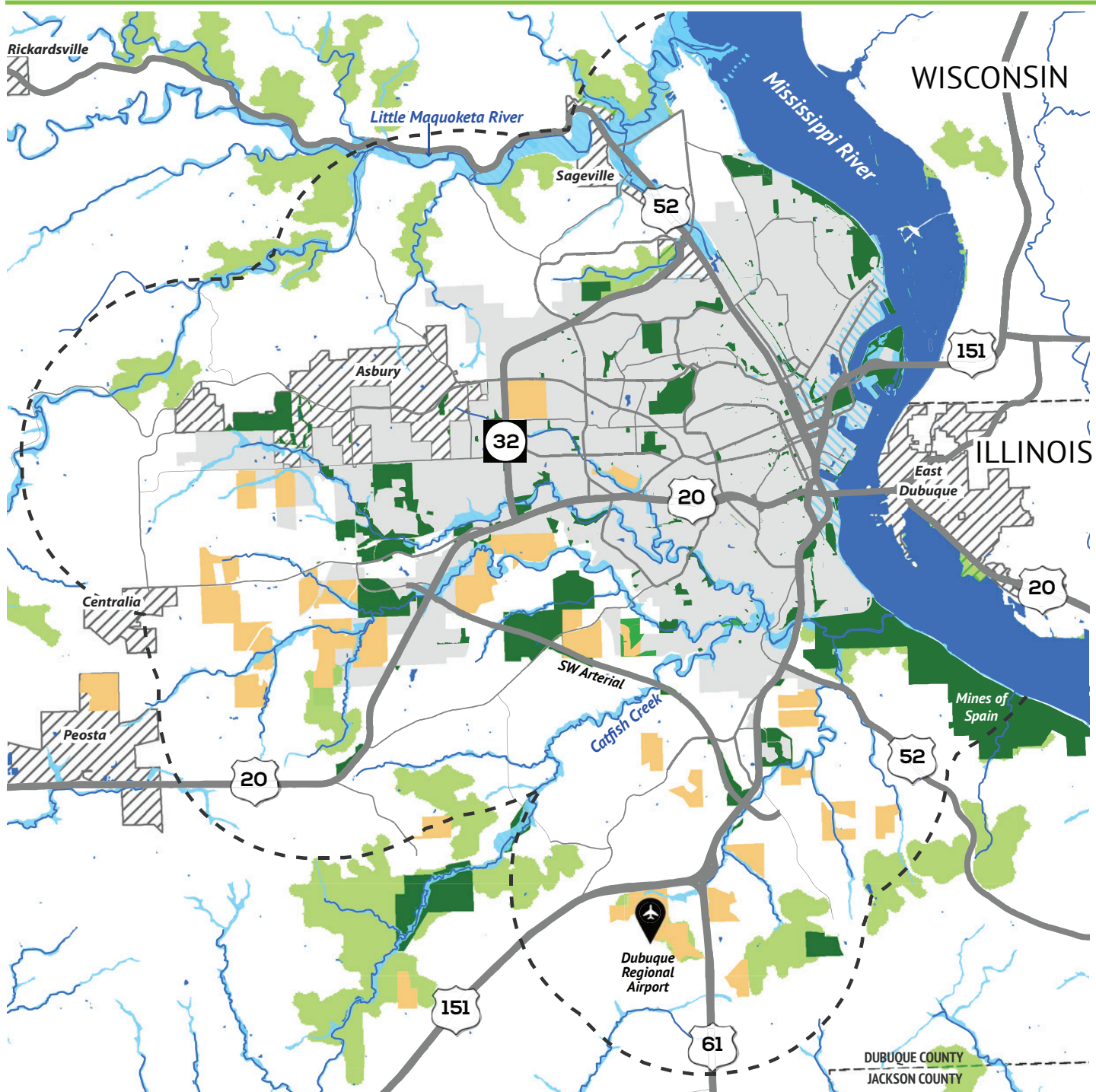
Specific areas of high ecological value (as illustrated on the Environmental Factors Map on the following page) include floodplains, parks, publically-owned protected lands, green infrastructure protection areas, and habitat cores.

- ☐ **Green Infrastructure Protection Areas** are identified in the Catfish Creek Watershed Management Plan. These areas are pivotal in storm-water management and water quality, as they allow for ground water infiltration through bio-swales and agricultural buffers.
- ☐ **Habitat Cores** are intended to identify essential habitats or natural communities that can absorb very little activity or disturbance without substantial impact to natural features or species. These areas have natural or semi-natural vegetation cover; agricultural developments are not included.

■ Environmental Policy

Ensure heightened development review when development occurs in green infrastructure protection areas, habitat cores, or other sensitive rural or natural areas.





Environmental Factors Map

Context

- Dubuque City Limits
- 2-Mile Extra Territorial Jurisdiction
- Other Municipalities

Environmental Features

- Rivers, Streams, & Lakes
- Parks
- Floodplain+
- Floodplain+
(Reduced Risk Due to Levee)

Conservation Areas

- Green Infrastructure Protection Areas*
- Habitat Cores**

THE CITY OF
DUBUQUE
Masterpiece on the Mississippi

IMAGINE DUBUQUE

*Federal Emergency Management Agency (FEMA) data

*Green Infrastructure Protection Areas are ecologically sensitive areas identified in the Catfish Creek Watershed Management Plan

**Esri data generated using 2011 National Land Cover Data. Core Habitat areas are intended to identify the essential habitat of the species of concern or natural community that can absorb very little activity or disturbance without substantial impact to the natural features.



0 0.75 1.5 3 Miles

Environmental Restoration in Eagle Point Park

The City of Dubuque adopted an Environmental Restoration Management Plan in 2017 FOR Eagle Point Park, a historic 164-acre community/regional park atop limestone bluffs along the Mississippi River. The 2017 plan identifies sustainable best practices for managing stormwater and soil erosion runoff and improving water quality downstream in the Bee Branch Watershed, and in turn the Mississippi River. The Environmental Restoration Management Plan recommends the use of rain gardens, infiltration basins, permeable surfaces, soil quality restoration, planting native vegetation, habitat restoration, and other green infrastructure improvements throughout the park.

- **Environmental restoration in Eagle Point Park** can provide demonstration projects and landowner education when implementing similar best practices in green infrastructure protection areas and habitat cores in the Catfish Creek Watershed.

Agricultural Protection

Outside of the city limits, agricultural land uses dominate the landscape. Typical farmlands include row crops, hay, pasture, and livestock uses. The Catfish Creek Watershed Management Plan identifies productive farmland and guides the reduction of erosion and creek pollution.

- **Growth should be coordinated** for the continuation of viable agricultural activities and a rural character and lifestyle where desired. Buffering requirements can help protect productive farmland from encroaching urban development.

□ Environmental Protection Partners

- Dubuque Soil and Water Conservation District
- Iowa Department of Agriculture & Land Stewardship
- Iowa Department of Natural Resources
- United States Environmental Protection Agency



▲ Recent enhancements to the Bee Branch Watershed have added native plantings to improve water quality and stormwater management capacity.

Eco-Education & Participatory Conservation



Get Outside + Explore: A desire was expressed during outreach to get more kids out into nature, participating in experiential learning. For example, using school property for gardens tended by students. Local examples with such experiential gardens include Lincoln Elementary School and Loras College.



Source: USDA

▲ Example: Elementary School children pull beets from their Habitat Garden in Washington, D.C.

Educational Programming

Online community suggestions and input shared at the environmental working group noted a desire for expanded environmental programs that get residents, particularly children, out of their homes and classrooms and into the environment. Concern was expressed that while there are some great resources available, the cost of these programs or admissions make them inaccessible to some residents.

National Mississippi River Museum & Aquarium offers a local resource for environmental education. The museum is actively involved in engaging school groups with educational programming. However, most of these experiences take place either in the classroom or at the museum. In April of 2016, the Museum offered its first ever free museum day. As funding permits, an annual free day would be a wonderful addition to help ensure accessibility to Dubuque residents.

The Friends of the Mines of Spain provide funds to the E.B. Lyons Interpretive Center at the Mines of Spain to reimburse schools, scouts, and youth organizations for transportation. Transportation can be a limiting factor in getting school and youth groups out into nature. The benefits of connecting youth to the natural world are multifold, and include improved attention spans and inspiring the next generation of environmental stewards. To further support on-going education, all programs provided by the Mines of Spain are free!

The Bee Branch Beekeepers Initiative offers educational, recreational, and volunteer opportunities focused on safety, watershed health, and connecting residents to the natural world. Beekeepers partners with local schools and community groups. For instance, students at Audubon Elementary School went on a walking tour of the Bee Branch Creek Greenway and learned about native plants and animals, as well as creek safety after rain events. The Leisure Services Department has also begun Bee Branch environmental programming.

Environmental Policy

Increase eco-education for children via additional partnerships between the City, school districts, colleges, and area institutions such as museums and cultural centers.



Environmental Policy

Continue to seek opportunities to implement engaging way-finding and heritage interpretive signage, and explore future opportunities to implement emerging digital technologies.



▲ Heritage Trail signage in Washington Park and education signage installed along the Bee Branch relaying the benefits of stream habitat enhancements.

Signage and Digital Storytelling

During the Environmental Integrity Workshop, many residents noted a desire for an “interactive experience” when engaging with nature. While smartphone apps are an excellent way to learn about and share information about the local environmental, research shows their data sharing and education potential remains largely untapped. According to one study, only 3.9% of nature-based apps are for visitor attractions such as arboretums or botanical gardens, and a mere .5% are for resident-scientists to collect and share data. The capability to input location-based data and encourage the general public to do so, could translate to marked strides for conservation science.

While the digital market catches up, interpretive signage and wayfinding can spark a lasting impression for visitors. Wayfinding guides visitors around a site in a logical circulation pattern, for example around the former lead ore mines at the Mines of Spain. Interpretive signs provide ecological, historical, and cultural information at natural stopping points, including informational signs at the Julien Dubuque Monument. Adding scannable QR codes for smartphones or other digital elements linked to audio recordings and web-based stories can create a memorable experience. Sites such as the Heritage Trail or the Dubuque Arboretum and Botanical Gardens would be appropriate for such storytelling.

Stormwater Best Management Practices

The City of Dubuque offers a Stormwater Best Management Practice (BMP) Materials Assistance Program to encourage residents to make improvements on their property to reduce the quantity or improve the quality of stormwater runoff from their land. Typical projects may include rain gardens, bioswales, permeable pavement systems, and streambank restoration. For more information, contact the City of Dubuque Engineering Department.

Tracking Water Usage

The City offers its water customers a free app, DBQ IQ, to track their water usage and monitor utility accounts. Weather data (temperature and precipitation) are also recorded to put consumption in context. DBQ IQ enables users to compare usage over a certain period to their average usage, compare their consumption to that of other users, and receive alerts in the case of leaks or backflows. Tracking consumption over time can help users become more attune to their water usage habits and help reduce consumption. To register, visit www.cityofdubuque.org/DBQIQ



Environmental Policy

Work closely with Dubuque Metropolitan Area Solid Waste Agency, and interested organizations such as Green Dubuque to expand composting.

▲ Composting idea shared at the Imagine Dubuque Farmers' Market Pop-Up Event held on August 19th, 2017.

Expand Composting

The City of Dubuque offers curbside collection services including yard waste and food scrap collection. Dubuque was the first city in Iowa to offer curbside food scrap pick-up. Food scrap recycling is not required for homes or businesses; however, affordable monthly subscriptions are available to residential, school, and commercial customers. A city ordinance requiring source separation of all organic materials, including food residuals, directed to a composting facility is one option to reduce methane emissions and landfill waste while creating a natural fertilizer product (compost). Another management option is encouraging partnerships between local farmers and restaurateurs to close the "compost circuit" by returning food scraps to the farm as food for animals or incorporation with crops. The DMASWA Landfill is home to the Household Hazardous Materials Regional Collection Center which offers seasonal, drop-off opportunities for household hazardous wastes.

Food waste can also be reduced via technology and partnerships between local restaurants, groceries, food pantries, and volunteers. MealConnect, a new app, is a platform for businesses that serve food to connect with food pantries and other organizations who collect and distribute donated food. By taking a picture and describing the amount and location of the food, MealConnect streamlines the donation process, thus increasing the amount of food donated, reducing waste, and feeding the hungry. The app is completely free and donations are picked-up at the businesses convenience.

Backyard Composting Resources: During outreach, many residents expressed interest in more composting resources such as classes. Instructions for how to get started with backyard composting are offered by Iowa State University. If this is not an option, DMASWA operates a Compost Facility located at the Dubuque Metro Landfill on Highway 20.



ENVIRONMENTAL INTEGRITY QUICK POLL:
Q: What other ways can the City advance green policies?



40%

A: Small Activation Projects

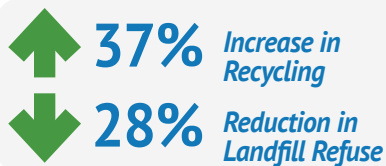
Residents would like to see small activation projects that inspire sustainable living (i.e. community gardens, solar panels for the home, composting how-to's, and rain barrel distribution). Approximately 40% (65 respondents) called for such projects in the Environmental Quick Poll.



Reduce

Expand Pay-As-You-Throw Program

Dubuque has already achieved some success in this area through the City of Dubuque's Pay-As-You-Throw program, a volume-based waste collection service. **Under the program, property owners are allotted one free 40-pound refuse can pick-up per week.** Additional cans cost \$1.50 each while oversized can "upgrades" are available on a monthly basis for \$5-\$8. Recycling pick-up is not charged by volume.



From its implementation in 2002 to 2013, the program reduced landfill refuse by 28% and increased recycling by 37%.

ENVIRONMENTAL INTEGRITY QUICK POLL:
Q: What initiatives will yield the most impact to ensure a more viable City for future generations?



A: Further Path Toward Zero Waste

Among respondents, 25% (41 respondents) reported that they would like to see the adoption of a "Path Toward Zero Waste" with measurable targets, timeline, and annual reporting. This sentiment was further supported at the Environmental Integrity Workshop.



Reuse

Develop/Locate Reuse Center

Many residents expressed a desire to see a reuse center in Dubuque, whereby individuals and companies can donate unneeded supplies for reuse in arts or other creative endeavours like woodworking.



Source: Flickr

- On a broader scale, many residents expressed a desire for a local **Habitat for Humanity Restore**. Restores sell donated home remodeling materials (i.e. cabinets, shingles, bathtubs), furniture, and appliances with proceeds going to support Habitat for Humanity.



Found Object Artwork | Artist: Amy Flynn,
Source: www.ifobot.com



Recycle

Consider Glass Recycling

In 2011, the City of Dubuque eliminated curbside glass recycling to save on costs. Savings have been passed on to residents, with the City of Dubuque lowering its solid waste collection fee by 37 cents

- Opportunities to recycle glass should continue to be evaluated on Dubuque's path towards zero waste.
- Another avenue might be to make glass available for artists to reuse. Curbside pickup of paper and plastics is ongoing.



Recycled Glass Mosaic | Source: Pixabay

Opportunities for further policy development exist:

- Charging market prices for recyclables, which are currently uncharged, would reduce material waste and expanding the policy to large businesses, which contribute the highest proportion of waste.

SPOTLIGHT ON VIABILITY

ZERO WASTE ECONOMY



With the ultimate goal of eliminating waste, a Zero Waste economy aims to reduce waste incrementally by creating circular production and consumption. There are two main components:

“Upstream” strategies to reduce the volume and toxicity of materials used in production while promoting low-impact or reduced consumption lifestyles.

“Downstream” strategies to reuse/recycle post-consumer products to their best possible use, driving new local economic opportunities and creating public benefits such as art.

The Dubuque Community Climate Action & Resiliency Plan identifies opportunities to reduce Dubuque’s greenhouse gas emissions 50% below 2003 levels by 2030.

En route to reducing emissions, waste reduction strategies are identified. The plan estimates the impact of existing and proposed waste reduction policies in Dubuque. These opportunities could be further developed to form community goals for a Zero Waste economy.

■ Environmental Policy

Further develop waste reduction strategies identified in the Climate Action & Resiliency Plan, such as food scrap composting and methane capture, to build-out, adopt, and implement, a Zero Waste economy.

ELEMENTS OF A ZERO WASTE ECONOMY



Product Redesign

All products are reusable, recyclable or compostable and include recycled content. Business innovation is supported and encouraged.



Smart Spending

Consumers purchase only necessities and demand recycled, minimally packaged recoverable products.



Transport

Transport of products is minimal and energy efficient.



Education

All people view waste as a valuable resource.



New Rules

Policies such as recycling mandates and incentives support zero waste.



Manufacturing

Conserves natural resources and is safe for people and planet.



Resource Recovery

Retailers take back products and all people have access to recycling and reuse facilities.



Jobs

Resource recovery and product redesign create jobs.

Source: www.landscapeeast.com



Hazard Mitigation

The City of Dubuque is currently participating in an update to the Dubuque County Multi-Jurisdictional Hazard Mitigation Plan. While the update is not yet complete, the City intends to have the plan adopted in April 2018. This collaborative, multi-jurisdictional update results in improved coordination and communication among local jurisdictions, which is important since impacts of hazards do not stop at jurisdictional boundaries. This approach also allows for a more comprehensive risk assessment and resulting mitigation strategies for the entire planning area.

Plan Goals

- ❑ **Mitigate:** Increase capabilities within Dubuque County entities to mitigate the effects of hazards by enhancing existing or designing and adopting new policies that will reduce the damaging effects of hazards.
- ❑ **Protect:** Protect the most vulnerable populations, buildings, and critical facilities within Dubuque County through the implementation of cost effective and technically feasible mitigation projects.
- ❑ **Prepare:** Improve the level of responder, government, business, and citizen awareness and preparedness for disaster.
- ❑ **Respond:** Develop programs to ensure that response agencies, governments, educational institutions, and local businesses are able to operate during times of disaster.

Actions

As part of the update, Dubuque participated in the following:

- Determined the Planning Area and Resources
- Built a Planning Team
- Created an Outreach Strategy and Conducted a Public Survey
- Reviewed the Community Capabilities
- Conducted a Risk Assessment
- Developed a Mitigation Strategy for Risks
- Review and Adopted the Plan (future)
- Keep the Plan Current (future)
- Create a Safe and Resilient Community



PUBLIC OPINION + TIMELINE

The City is updating existing mitigation practices and developing new actions based on public opinion collected from surveys, an analysis of State of Iowa priorities for hazard mitigation assistance, FEMA's Mitigation Ideas and the hazard mitigation planning process.

Most Likely Hazards

Public opinion indicates the following hazards are most likely to occur in Dubuque County: severe storms/flash flooding, tornado/windstorm; thunderstorm/lightning/hail; severe winter storm; transportation incident, and extreme heat.

Greatest Impact Hazards

Public opinion suggests the following hazards are to have the greatest magnitude in Dubuque County: severe storms/flash flooding, tornado/windstorm; thunderstorm/lightning/hail; hazardous materials incident; severe winter storm, and transportation incident.

The City of Dubuque identifies the most likely hazards as well as those hazards that will have the greatest magnitude within the City, as required by state and federal agencies. In addition, the City is developing mitigation strategies for the risks identified within the community.

The timeline for completion includes:

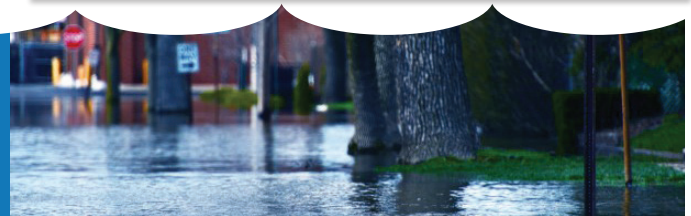
- | | |
|-----------------|---|
| • October 2017 | Finalize plan updates |
| • November 2017 | Submit plan to FEMA |
| • March 2018 | FEMA Approval (<i>Pending Adoption</i>) |
| • April 2018 | Plan Adoption |

* See the Dubuque County Multi-Jurisdictional Hazard Mitigation Plan for the City of Dubuque's specific local hazard mitigation plan following its adoption.



DUBUQUE STORM-WATCH

Severe storms and flash flooding are one of Dubuque's more frequent and impactful threats, and presents the greatest probability of future occurrence.



Environmental Recommendations

Clean Water

- ❑ Continue to implement the Climate Action Resiliency Plan by focusing on waste reduction, transportation improvements, and energy efficiency of homes and businesses to achieve climate goals. This effort will require the work of the entire community, including non-profits like Green Dubuque and the DBQ Energy District, the City, and our residents and businesses. 🌿❤️🏠
- ❑ Continue to implement the Catfish Creek Watershed Management Plan to protect creeks, sensitive ecological habitats, and promote conservation-minded development. 🌿❤️

Clean Air + Energy

- ❑ Continue to implement the Climate Action & Resiliency Plan by focusing on waste reduction, transportation improvements, and energy efficiency of homes and businesses to achieve climate goals. This effort will require the work of the entire community, including non-profits like Green Dubuque and the Dubuque Energy District, the City, residents, and businesses. 🌿❤️🏠
- ❑ Support mobile air quality monitoring to increase citizen awareness and identify conditions contributing to sub-optimal/poor air quality. 🏠

Healthy Neighborhoods

- ❑ Continue Healthy Homes strategy as part of the CHANGE and Bee Branch revitalization efforts and educate the community on Healthy Home principles. 🌿❤️🏠
- ❑ Continue to implement the Emerald Ash Borer Readiness Plan and Urban Forestry Goals to maintain safe and healthy neighborhoods. 🏠
- ❑ Seek partnership opportunities to increase localized native plant, pollinator habitat, and edible landscaping in public spaces. 🌿❤️

Land Conservation

- ❑ Conserve areas near waterways shown on the Environmental Factors Map, including rivers and creeks, to provide serene places to escape the city and viewpoints to watch migratory birds. 🏠

Eco-Education + Participatory Conservation

- ❑ Promote educational programming and partnerships that enable children to experience nature. ❤️🏠
- ❑ Explore incentives for backyard and curbside composting that reduce the proportion of landfilled food waste. 🌿🏠
- ❑ Explore a community-wide Zero Waste Policy that creates a closed circuit economy of low-impact or reduced consumption lifestyles and marketplace for post-consumer products. 🌿❤️🏠

🌿VIABLE..... 🌿
❤️LIVABLE..... ❤️
🏠EQUITABLE..... 🏠

Each recommendation listed relates to making Dubuque more viable, livable, and equitable. The symbols noted above correspond to these guiding principals and are listed along with the recommendations they pertain to.



Page Intentionally Left Blank for Double-Sided Printing