

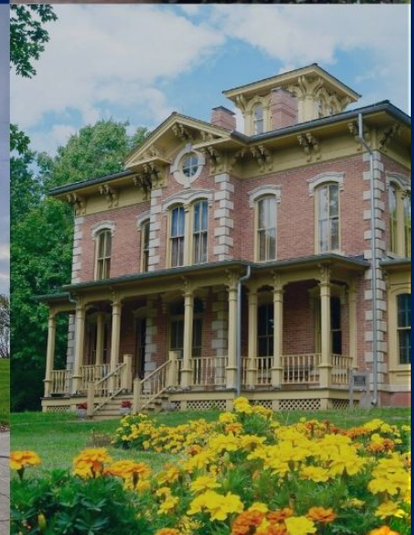


Sustainable Urbandale Action Plan

City of Urbandale, Iowa





PREFACE

The Department of Community and Regional Planning (CRP) at Iowa State University (ISU) has a long tradition of working with communities across the state. In the fall of 2023, knowing that I was going to be the instructor for the upcoming CRP 432 (Community Planning Studio), an undergraduate required course, I contacted the City of Urbandale. At that point, I had learned about Urbandale efforts to increase sustainable practice in the community for all residents. And that was a perfect match because my goal was to identify a client for my spring 2024 undergraduate students – a client that wanted to develop a plan related to sustainability.

My November visit to Urbandale was very successful, as John Konior (Director of Risk Management/ Support Services) shared that the City Council was working on the adoption of the Urbandale Sustainability Statement. By December, I had committed to teach the Community Planning Studio course based on developing a sustainability-related plan with Urbandale. In the spring of 2024, working collaboratively with Urbandale staff – led by John Konior and Kristi Bales (Assistant Director of Community Development) – CRP 432 undergraduate students undertook the challenge and developed the plan presented in this document. Additionally, MidAmerican Energy staff participated in the planning process.

From a pedagogical perspective, CRP 432 gave students an opportunity to comprehend and analyze a unique geographic context pertinent to community planning, using tools and techniques in an applied setting. It also allowed students to engage in the process of making a community plan, exploring historical patterns, current conditions, and strategies for planning. Although the work was developed in an academic setting during a short time period, every effort was made to outline and structure the entire process.

Community engagement was a central element in the teaching and learning process. Students were responsible for defining and conducting each community engagement event.

Natalia Nery De Farias was an outstanding teaching assistant for the studio class. She was always engaged in supporting students and providing valuable insights to the SUAP.

The Renewable Rescuers Game was developed by Jackson Vanderheyden under the guidance of Dr. Aaron Yang, with graphic design by Hina Malik. These three were superstars and did an amazing job from start to end of the game. A big thank you to Jackson, Hina, and Dr. Aaron Yang.

This accomplishment would not have been possible without the editorial and layout design efforts of Ella Tollefsrud. In addition, Kristen Hoss' dedication was indispensable to achieve the quality of the plan presented here. This plan has the potential to make the City of Urbandale a strong leader of sustainable practices in Central Iowa. Hopefully, it will!

Mônica A. Haddad, Professor

Department of Community and Regional Planning, Iowa State University

August, 2024, Ames, IA

EXECUTIVE SUMMARY

The community of Urbandale is committed to becoming a leader in sustainable strategies to foster resilient and equitable outcomes for the city's future. The Sustainable Urbandale Action Plan (SUAP) outlines citywide goals that address issues related to decreasing fossil fuel use, diminishing greenhouse gas emissions (GHG), and combating urban sprawl.

Within each goal, this plan defines ambitious actions that reflect community priorities, centering on Urbandale's residents and environment. These multidimensional goals intersect, leading to various co-benefits. The interconnected nature of these goals and actions enhances overall effectiveness and amplifies the positive impact on multiple fronts. Knowing that changes in the climate impact socially vulnerable areas and historically marginalized communities disproportionately, the SUAP is rooted in the principle of equity to ensure that all residents thrive in a just city.

From the beginning, the key sustainable development codes that built the SUAP are promoting renewable energy with incentives, density bonuses for the installation of solar energy panels, net-zero energy buildings, and infill development. The SUAP considers environmental, social, and economic transformations to make bold and necessary steps toward a stronger future, ensuring that Urbandale achieves these sustainable development codes throughout its diverse initiatives.

The vision statement for the SUAP outlines an ambitious and holistic approach to implementing sustainable goals in Urbandale. It reflects the city's dedication to sustainability, resiliency, and equity. This vision was created during the scenario presentation event, which will be described in greater detail further in the document. At this event, three visions were presented: *Green Prosperity, Smart Growth,* and *Conservation & Ecosystems*. The plan's final vision is a combination of the three presented scenarios.

The City of Urbandale is an innovator in low-carbon solutions across Central Iowa. Urbandale members prioritize the environment while being mindful of resources, fostering a community where people and nature thrive.

This statement articulates a comprehensive vision for a sustainable future in Urbandale, emphasizing a commitment to innovation, enhancing communal well-being, and conserving natural resources and ecosystems.

To ensure that these sustainable development codes will become a reality for all Urbandale residents, the City of Urbandale will adopt high-impact goals and actions to leverage existing resources and ensure sustainable future development. The codes inspired a comprehensive list of goals across multiple domains to enhance quality of life and environmental stewardship. These goals include:

People Goal

Goal A: Increase awareness about sustainable practices and education opportunities focusing on low-carbon solutions.

Renewable Energy

Goal B: Expand the availability and usage of solar renewable energy to reduce future greenhouse gas emissions.
Goal C: Reduce fossil fuel usage for all buildings' energy consumption.

Net-Zero Energy Buildings

Goal D: Ensure that new commercial and industrial buildings maximize energy efficiency through weatherization.
Goal E: Retrofit existing buildings to reduce energy consumption.

Infill Development

Goal F: Integrate nature-based solutions into built environments to support sustainable urban growth.

Goal G: Enhance ecosystem services as a critical component of resiliency, promote biodiversity, and protect environments from the effects of urbanization.
Goal H: Increase access to walking and biking infrastructure to reduce carbon emissions.
Goal I: Improve access to nutritious, affordable, and culturally desirable food for all.
Goal J: Promote land-use development patterns to improve the utilization of assets in the built environment.

This plan presents an opportunity for Urbandale to direct investments into renewable sources and upgrade existing assets to provide local job creation, support collective social change, and mitigate GHG emissions. This plan envisions Urbandale to be an innovator in low-carbon solutions across Central Iowa, prioritizing the environment while being mindful of resources to foster a community where people and nature thrive.

The City of Urbandale has a rich array of features and amenities. By leveraging existing opportunities and capitalizing on current city assets, Urbandale aims to ensure that all improvements and initiatives under the SUAP are affordable and reasonable. The city will forge partnerships with diverse stakeholders to fund and support the progression of the various goals and actions outlined in the SUAP. This collaborative approach will allow the city to maximize resources, foster innovation, and further sustainable development goals that benefit the community for all.

Community engagement played a pivotal role in the development of an effective sustainable action plan to ensure that diverse perspectives and local knowledge are integrated in the creation of the SUAP. By actively involving residents in discussions and presentations, specific environmental and local concerns were identified, and data was gathered from participants. The first community engagement event was held at the Chamber of Commerce, with 20 attendees. The second event was at Urbandale's Public Library with 35 attendees, the third event being a focus group of refugees and immigrants to Urbandale with 15 participants, and finally a scenario presentation with 25 attendees.

To ensure transparency and continuous improvement, the progress of the SUAP will be tracked through a comprehensive monitoring framework. Key quantitative and qualitative performance metrics will be annually reviewed and publicly reported to receive feedback from residents and stakeholders to confirm satisfaction and growth, enhancing the overall effectiveness of the plan's goals. A flexible monitoring approach will be used to manage continuous feedback and allow for adjustments throughout the implementation of the SUAP's goals and actions. By adhering to the SUAP and these ambitious targets, Urbandale aims to create a more sustainable, equitable, and resilient future that improves life for all residents.

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Community Planning Studio Participants:

Ahillan Kumar
Ashton Wheeler
Carla Prochaska
David McGee
Ella Tollefsrud
Ezekiel Newell
Greenlee Dahle
Jack Harris
Jack Miller
Kristen Hoss
Lindsey Wilson
Myer Loeb
Nicholas Alexander
Paige Harman
Sophia Wepking

Instructor: Dr. Mônica A. Haddad

Teaching Assistant: Natalia Nery De Farias

Editors and Layout Designers: Ella Tollefsrud and Kristen Hoss

In Partnership with:

City of Urbandale:
John Konior, Director of Risk Management/Support Services
Kristi Bales, Assistant Director of Community Development

Urbandale Partners Chamber of Commerce:
Tiffany Menke, President of the Urbandale Chamber of Commerce

Urbandale Library:
Nicholas Janning, Library Director

MidAmerican Energy:
Erin Rasmussen, Director, Energy Efficiency

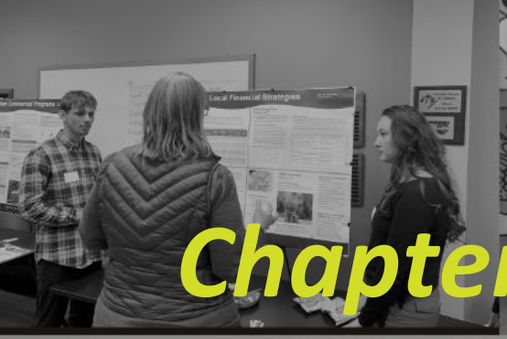
Urbandale Community Action Network (UCAN):
Betty Devine

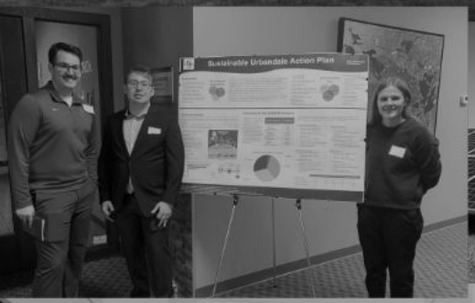
EMBARC:
Ruth Fifield

Urbandale Community

Thank you to all members of the Urbandale community who participated in the public engagement events that helped progress the Sustainable Urbandale Action Plan. Your attendance and participation helped identify and strengthen the goals and actions for the city's future outlined in this report.

Chapter 1: Introduction





INTRODUCTION

In April of 2023, the City Council of Urbandale adopted the Urbandale Sustainability Statement:

> *The City of Urbandale aspires to model the key pillars of a sustainable community. Urbandale will be an environmentally sustainable community that promotes natural resource stewardship and waste reduction efforts. It will be a resilient community prepared for natural, social, and economic shocks that are driven by a changing world. We work to be an inclusive community that brings all dimensions of our society together to achieve these goals. And Urbandale will be a competitive community that promotes its strong labor force and economic advantages efficiently to limit its intended or unintended negative impacts on our community.*

The City Council letter (dated April 4, 2023) describes:
"In 2021, the City of Urbandale engaged the University of Northern Iowa's Center for Energy and Environmental Education (CEEE) to complete a community-wide greenhouse gas (GHG) emissions inventory report. The data used to complete that report was from the calendar year 2020. CEEE completed its emissions report in the second quarter of 2022 and presented its findings to the City Council at its August 16, 2022, Lunch & Learn work session. The Urbandale GHG Emissions report defined the three largest sectors that contribute to Urbandale's total emissions. Those sectors are transportation (34.5%), residential energy usage (31.6%), and commercial/industrial energy usage (29.3%)." The report then provided climate action plan recommendations and four reference cities of comparable size and location within a metropolitan area. The report provided a goal for Urbandale, which stated 'Urbandale should aim to reduce greenhouse gas emission 50% by 2030, 80% by 2040, and net zero by 2050' (City of Urbandale, 2023).

"The question still unanswered for Urbandale's climate action plan strategy is where to start and how to proceed forward. In drafting the following recommendations, staff recognizes the complexity of the topic and the nuanced political points of view surrounding GHG emissions and climate change. In addition, regardless of the source that changes the weather patterns, we all agree that natural conditions change over time. Those changes directly impact our community through natural disasters, a shift in the economy based on national and international economics, and our health as weather changes affect our natural surroundings and temporal zones. It is recommended that the City adopt a sustainability statement to provide a structural framework to this issue. Think of this as a community-wide vision statement. Staff proposes the [former] statement, which was tailored from other statements published by the World Bank, United Nations, and the State of Iowa" (City of Urbandale, 2023).

SUSTAINABLE DEVELOPMENT CODES

"To implement action items, staff recommends leveraging partnerships, sourcing best practices, and leading by example. […] To impact residential and commercial/industrial energy usage, the city would use the Sustainable Development Code's website" (City of Urbandale, 2023). The website can be found at www.sustainabledevelopmentcode.org.

The Urbandale Sustainability Statement was the starting point for the Sustainable Urbandale Action Plan (SUAP). After the adoption of the statement, city staff explored the Sustainable Development Codes, which are recognized as best practices for community development. These codes are based on research and case studies to help city officials and the public identify options for removing environmental obstacles. The City of Urbandale staff examined these codes and selected four Sustainable Development Codes to act as the basis of this plan:

- *Promote renewable energy with incentives:* Local governments incentivize renewable energy adoption through various measures, like rebates, tax incentives, and expedited permitting, aiming to reduce reliance on fossil fuels and mitigate emissions.
- *Density bonus for installation of solar energy panels:* Providing density bonuses for installing solar energy systems incentivizes green energy adoption in residential areas, promoting sustainability while addressing urban sprawl concerns.
- *Net-zero energy buildings:* These buildings produce as much energy as they use through renewables, like solar or wind power, with government mandates or incentives promoting sustainability and emissions reduction.

- *Encourage infill development:* Infill development revitalizes communities by repurposing vacant land within developed areas, promoting conservation and community vitality through various projects and incentive programs.

THE PLANNING PROCESS

The SUAP is a goal- and action-based plan driven by collective visions for community and city enhancement. This sustainable action plan is designed as a resource for future policy and program decision-making and implementation. The SUAP outlines 10 goals and 56 total supporting actions to protect the environment and reduce pollutants that contribute to climate change and greenhouse gas (GHG) emissions.

Urbandale recognizes the value of young voices and perspectives to ensure quality and desired futures. With Iowa State University's (ISU) assistance, the City of Urbandale collaborated with 15 undergraduate students from the College of Design's Department of Community and Regional Planning to develop this plan in the spring of 2024.

The undergraduate students were enrolled in the CRP 432 Community Planning Studio course. The class worked for 16 weeks, approximately 15 hours per week, sometimes individually or as small groups, but continuously operating as a united team. The course was based on a planning process that encompassed six distinct phases, which can be defined as 1) Introducing sustainability planning, 2) Learning from other cities, 3) Implementing community engagement events, 4) Building scenarios, 5) Developing goals and actions in detail, and 6) Writing the SUAP.

First, the CRP 432 students were introduced to sustainability planning. They researched various sustainable/climate action plans across the United States and Canada to understand a plan's structure. Taking inspiration from leading sustainable cities, the students noted feasible ideas, partnerships, and funding sources for each goal/action, and how to implement equity properly. The students noted the best practices and policies from which the City of Urbandale could benefit from. To further assess the viability of these ideas, students collected secondary data about Urbandale and examined their relevance to the city.

The students also collected primary data from Urbandale residents. The students held several community engagement events in Urbandale to present their ideas and gather feedback from residents.

The City of Urbandale and the ISU students value their partnership with MidAmerican Energy, as the company participated in the entire process by providing guidance and support for the students. From the beginning of this plan, collaboration and understanding were prioritized. The students ensured that all community engagement events were scheduled to incorporate the perspectives and opinions of Urbandale residents. Public feedback was integral to shaping each of the goals and actions included in the final SUAP.

Community Engagement

Chamber of Commerce Event

In order to secure support from planning officials, city staff, and MidAmerican representatives, the Community Planning Studio team conducted a community outreach event. The Urbandale Chamber of Commerce hosted this event on March 4, 2024 and held 20 attendees. It was open-house-style, allowing the students to share the information they gathered on various sustainability-related topics. The students brought posters that covered the following topics:

- *Greenhouse gas emissions:* Greenhouse gases (GHGs) are gases in the Earth's atmosphere that trap heat contributing to climate change.
- *Solar energy:* Providing Urbandale residents with information about this renewable energy source and incentive programs offered.
- *Geothermal and Biomass energy:* Geothermal harnesses the Earth's internal heat, providing a sustainable source of electricity and heating. Biomass energy utilizes organic materials such as wood, crop residues, and animal waste to produce heat or electricity.
- *Net-zero energy buildings:* Net-zero energy buildings generate enough energy from renewable sources to offset their annual energy consumption.
- *Infill development:* Infill development involves the development of vacant or underutilized land

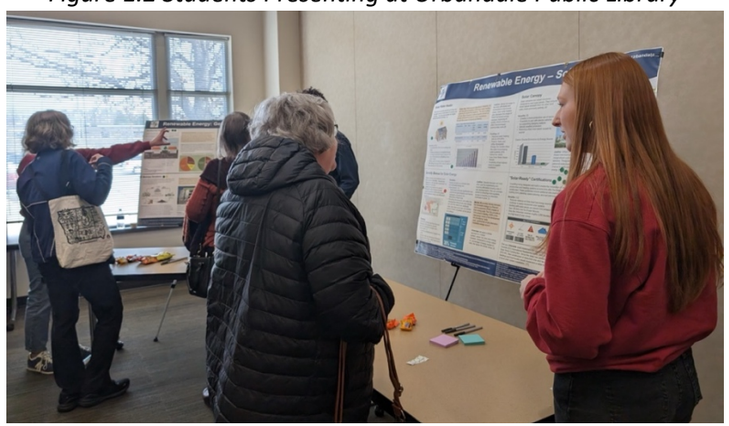
Figure 1.1 Students Presenting During the Event at the Chamber of Commerce

Each poster provided thorough explanations, images, funding sources, potential partners, and proposed strategies on how Urbandale can implement these ideas (Figure 1.1). Each attendee was offered green, yellow, and red stickers—green showing support, yellow indicating neutrality, and red for rejection—to visually display their response to a potential plan. Information was also provided about MidAmerican Commercial Programs and local financial strategies that could support the ideas. The aim of this event was to engage the representatives of Urbandale's business community and gather feedback on the feasibility and appeal of various proposed plans. At the end of the event, an optional survey could be taken by participants to leave general feedback about their thoughts on the given topics (see Appendix A). There were 13 respondents to the survey, and many shared similar opinions that the proposed ideas were feasible for Urbandale.

Public Library Event

On March 6, 2024, the team of students held a community engagement event at the City of Urbandale's Public Library. At this event, the posters from the Chamber of Commerce event were used again. This allowed the same information to be shared with a new group of Urbandale residents, providing the Community Planning Studio with broader feedback from 35 attendees (Figure 1.2). This was also an open-house style event, in which attendees freely walked to each poster and asked questions as needed. When first arriving, participants were handed a punch card to encourage them to visit each poster. Each person was also offered green, yellow, and red stickers—green showing support, yellow indicating neutrality, and red for rejection—to visually display their response to a proposed plan. If the attendees went to each poster and finished their punch card, they received an Earth keychain on their way out.

Figure 1.2 Students Presenting at Urbandale Public Library



The Public Library event was a milestone in the planning process as it allowed the students to present their ideas for public opinion. The students noted every comment to ensure that the SUAP is plentiful in addressing communal needs. At the end of the event, an optional survey could be taken by attendees to leave general notes about the presented sustainability topics (see Appendix B). 24 participants took the survey, providing helpful feedback. Over 75% of the survey respondents favored affordable housing, renewable energy, infill development, and constructing net-zero energy buildings.

Refugees/Immigrants Focus Groups

On March 26, 2024, four refugees/immigrants focus groups was held at Aldersgate United Methodist Church in partnership with two Non-Government Organizations (NGOs). The NGOs were Ethnic Minorities of Burma Advocacy and Resource Center of Iowa (EMBARC) and Urbandale Community Action Network (UCAN). During this engagement event, 15 Urbandale refugee and immigrant residents shared their experiences in Urbandale. There were three participants from Mexico, ten from Burma, and two from Iraq. Four focus groups were conducted. The Community Planning Studio team asked the participants various questions regarding safety, affordable housing, food access, and walkability in Urbandale (see Appendix C). This event provided important insight into the perception of Urbandale from refugee and immigrant residents and allowed for their experiences and suggestions to be heard.

Figure 1.3 Students and Interpreter with Local Refugees and Immigrants

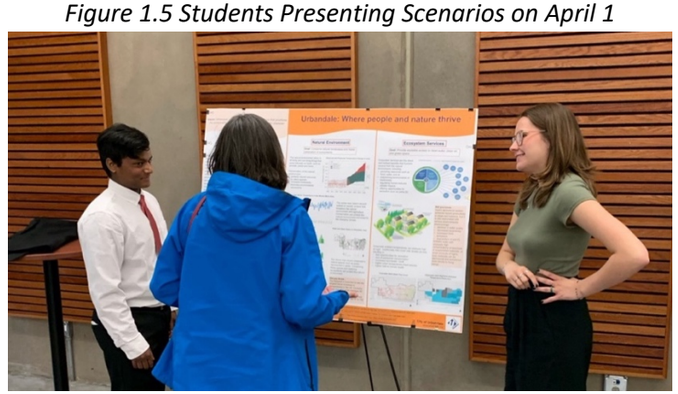
The students appreciated the interpreters from ISU and EMBARC for facilitating a conversation on such important topics (Figure 1.3). They ensured this event was as welcoming and easy as possible for all participants. All conversations had during the focus group were recorded, with consent, and later used to find common themes and meaningful quotes that apply to each of the goals in the SUAP. As the refugee and immigrant residents were discussing with some of the ISU students, other members of the Community Planning Studio team were able to interact and watch the children who came with their parents (Figure 1.4). To encourage participation, a $20 Walmart gift card and free snacks/food were offered to anyone who attended.

Figure 1.4 Focus Group Participants

Scenarios Presentation

On April 1, 2024, the Community Planning Studio team held another community engagement event at the Giovannetti Community Shelter to present scenarios based on feedback from the previous events. This was hosted as an open-house-style event with three overarching visions (Figure 1.5). Each vision had a correlating goal and three sub-pillar scenarios.

Figure 1.5 Students Presenting Scenarios on April 1



25 residents attended this event. As attendees walked to each poster, the information was presented on the purpose of the visions and the actions to support each one. Residents were given green and red stickers to share feedback–green showing support and red for rejection. Notes were taken of these stickers and other comments received to ensure they are addressed in the SUAP. This event aimed to gather public opinion about the feasibility and desirability of implementing the visions and scenarios in the city. The visions are as follows:

Green Prosperity: Urbandale is a leading innovator in low-carbon solutions across Central Iowa that supports a green economy and prioritizes the environment while being mindful of resources.

- Economic Growth: Expand low-carbon economic activities.
- Human Capital: Foster a diverse, green labor force through workforce development, job growth, and economic mobility.
- Green Innovation: Bolster the adoption of a wide range of technologies that preserve the environment and diversify businesses,

Smart Growth: Urbandale is a dynamic city in Central Iowa, where seamless connectivity, pleasant livability, and various choices are part of all residents' lives.

- Land Development: Utilizes mixed-use development through diverse commercial and residential opportunities.
- Public Health and Safety: Enhance the community's health, wellness, and environment with safe and walkable areas.
- Downtown: Strengthen Urbandale's downtown identity, focusing on social and economic experiences.

Conservation and Ecosystem: Urbandale maintains itself as a suburban oasis that prioritizes the conservation of existing landscapes and community character where people and nature thrive.

- Built Environment: Ensure that development is sustainable by preserving and protecting the existing built environment.
- Natural Environment: Conserve natural landscapes and foster restoration of ecosystems.
- Ecosystem Services: Provide equitable access to clean water, clean air, and green space.

Plan Presentation

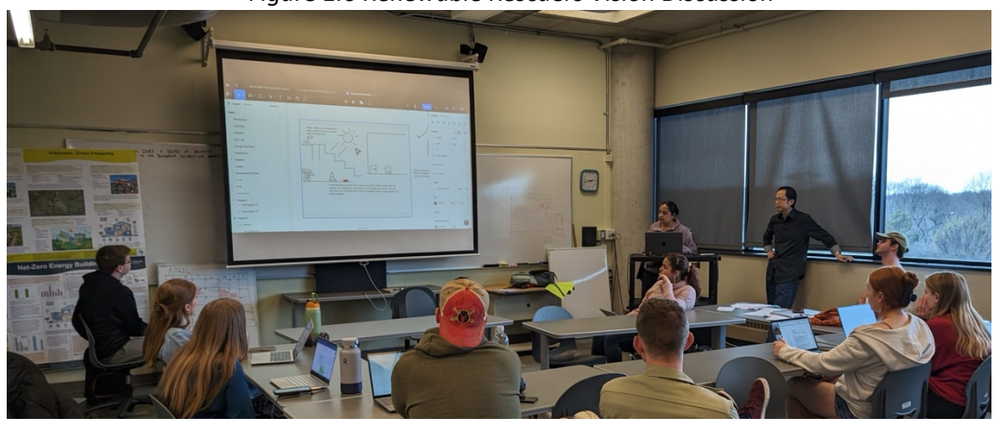
On May 1, 2024, the Community Planning Studio team presented the goals and actions at the Ralph Whitten Shelter at Lions Park. The presentation included one action from each of the 10 goals in a PowerPoint for Urbandale residents. A comprehensive list of the SUAP's goals and actions was provided as a handout to those who attended. Residents were encouraged to ask questions and give feedback on the goals to make the necessary changes before the final plan was developed.

Renewable Rescuers Game

The SUAP helped launch a new game called *Renewable Rescuers* to educate players about renewable energy sources and sustainability practices (Figure 1.6). The game is divided into worlds that reflect the plan's principal sustainability codes: renewable energy, net-zero energy buildings, and infill development. The players progress through different worlds by solving puzzles and collecting resources, gradually reducing smog or pollutants displayed on a meter. The game culminates in a final confrontation with an evil villain, symbolizing overcoming environmental challenges. The development process involved refining gameplay mechanics, simplifying features, and incorporating educational content such as fun facts and questions related to sustainability. Collaboration between the Community Planning Studio students and the game development team resulted in a captivating game that promotes awareness of renewable energy and sustainability.

The game is offered for Urbandale youth and other youth interested in the topic. The game can be accessed with the following link: https://jvandy.itch.io/renewable-rescuers. Anyone can find and play the game for free. It can be played from either a mobile device or on a computer. Mobile controls can be enabled in settings on any mobile device.

Figure 1.6 Renewable Rescuers Vision Discussion



Travel Days

Urbandale City Hall

On January 22, 2024, the Community Planning Studio team visited Urbandale for the first time to meet with professionals and discuss the beginning steps in creating the SUAP. The students met with Urbandale City Council Members, planners, and a representative from MidAmerican. This took place at the Urbandale City Hall. This opportunity allowed the ISU students to gain an understanding of Urbandale and to ask any questions about the city and the plan.

Ingersoll Net-Zero Building

On April 1, 2024, the Community Planning Studio team visited a net-zero energy building in Des Moines (Figure 1.7). It is located at 2701 Ingersoll Ave and is Iowa's first zero-carbon certified building. It was formerly a Star Gas Station and is now becoming a three-story, mixed-use complex with commercial stores on the first floor and affordable housing on the two floors above.

The Community Planning Studio team spoke with the developers from Cutler Development and the lead construction manager and asked questions about how they accomplished their goals. The developers were committed to making this building contain affordable housing and further their sustainability initiatives. They utilized a design/build project delivery method, valued engineer designs, and put great effort into staying within the budget to make this possible. The Community Planning Studio was able to learn about a real-world case study that was able to accomplish zero-carbon certifications while also offering affordable housing, which is a growing need everywhere.

Figure 1.7 Students Learning about Constructing Net-Zero Buildings

Iowa City

On April 3, 2024, the Community Planning Studio traveled to the City of Iowa City to learn more about developing a Climate Action Plan. Iowa City has one of the oldest Climate Action Plans in the state of Iowa, adopted in 2018. The class met with city staff and several of their partners to learn about the various programs Iowa City has utilized to implement its plan (Figure 1.8). The class began by touring the Environmental Education Center and engaging with city staff about the development of their plan. Next, a local Habitats for Humanity representative spoke about sustainable building practices. The class ended the day by visiting the Bike Library (Figure 1.9). This non-profit organization is working to implement sustainable practices within its building and provides educational opportunities to encourage biking within the community. The Bike Library hosts various community engagement events, prioritizing inclusivity for minority communities.

Figure 1.8 Students Learning about Net-Zero Buildings in Iowa City

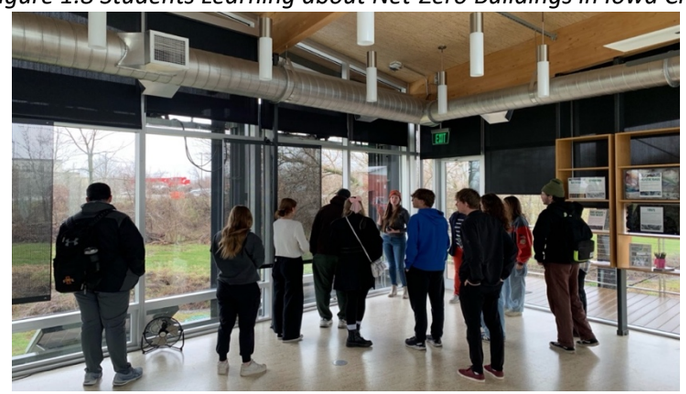


Figure 1.9 Students at the Bike Library in Iowa City

GUIDING PRINCIPLES

In addition to the four Sustainable Development Codes, each goal of the SUAP is based on three principles: The United Nations Sustainable Development Goals, Co-Benefits, and Equity & Justice.

United Nations Sustainable Development Goals

In 2015, world leaders of the United Nations (UN) adopted the 2030 Agenda for Sustainable Development and the 17 Sustainable Development Goals (SDGs). The Agenda and SDGs serve as a roadmap for peace and prosperity for the planet and its people–tackling human rights abuses, ending poverty, violence, and inequalities, and working to preserve the environment. The SDGs highlight the intersectionality of sustainable development's environmental, social, and economic aspects. This recognition is crucial for addressing global challenges comprehensively and ensuring inclusivity and sustainability are at the center of development (United Nations, n.d.).

The United Nations assigns unique symbols to each of the 17 SDGs and offers detailed explanations for each, aiming to achieve a collective understanding of the objectives of the Agenda and the SDGs. The students identified the SDGs as valuable tools for the SUAP to

strengthen the community. These goals were recognized throughout the planning process of the SUAP and have been identified in each of its actions. The corresponding image for each goal will appear throughout the plan whenever an action aims to advance that specific SDG. The 17 SDGs are listed and explained below:

SDG 1: No Poverty – End poverty in all its forms everywhere.

***SDG 2:* Zero Hunger** – End hunger, achieve food security and improved nutrition, and promote sustainable agriculture.

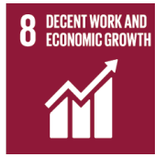
***SDG 3*: Good Health and Well-Being** – Ensure healthy lives and promote well-being for all ages.

***SDG 4:* Quality Education** – Ensure inclusive, equitable, and quality education and promote lifelong learning opportunities for all.

***SDG 5:* Gender Equality** – Achieve gender equality and empower all women and girls.

***SDG 6:* Clean Water and Sanitation** – Ensure availability and sustainable management of water and sanitation for all.

***SDG 7:* Affordable and Clean Energy** – Ensure access to affordable, reliable, sustainable, and modern energy for all.



***SDG 8:* Decent Work and Economic Growth** – Promote sustained, inclusive, and sustainable economic growth, full and productive employment, and decent work for all.

***SDG 9:* Industry, Innovation, and Infrastructure** – Build resilient infrastructure, promote inclusive and sustainable industrialization, and foster innovation.

SDG 10: **Reduced Inequalities** – Reduce inequality within and among countries.

SDG 11: **Sustainable Cities and Communities** – Make cities and human settlements inclusive, safe, resilient, and sustainable.

SDG 12: **Responsible Consumption and Production** – Ensure sustainable consumption and production patterns.

SDG 13: **Climate Action** – Take urgent action to combat climate change and its impacts.

SDG 14: **Life Below Water** – Conserve and sustainably use the oceans, seas, and marine resources for sustainable development.

SDG 15: **Life on Land** – Protect, restore, and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and biodiversity loss.

SDG 16: **Peace, Justice, and Strong Institutions** – Promote peaceful and inclusive societies for sustainable development, provide access to justice for all, and build effective, accountable, and inclusive institutions at

SDG 17: **Partnerships for the Goals** – Strengthen the means of implementation and revitalize the Global Partnership for Sustainable Development.

Co-Benefits

The 15 undergraduate students identified and defined various co-benefits associated with the actions and goals within the SUAP. A co-benefit is a positive outcome that results from climate action that is not the primary goal of the action. While sustainability and resiliency remain at the forefront of the plan, these actions contribute to community flourishing in more than one way.

Below is a complete list with the definition of all the SUAP's co-benefits. Throughout the plan, these terms will be listed with their associated action.

- *Barrier Reduction:* The increased access to renewable energy device installation in socially vulnerable areas within the community.
- *Community Development:* The enhancement of well-being and the community's quality of life through various social, economic, and environmental initiatives.

- *Connectivity Enhancement:* The development of trail networks that link important community-recognized destinations, providing a variety of movement options for residents.
- *Energy Efficiency:* The process of reducing the amount of energy required to power infrastructure and raising awareness about the deficiencies in building design to improve GHG emissions levels and societal well-being.
- *Future Prosperity:* The anticipation of sustainable economic growth and overall well-being for individuals and communities through investments and planning in emerging sectors.
- *Livability Refinement:* The promotion of quality and stable housing units/commercial structures for a more efficient community.
- *Partnership Formation:* The formation of financial support from businesses that align with the city's mission and vision statements that incentivize sustainable business practices and indirectly foster sustainable residents.
- *Stormwater Management:* The process of managing excess water and removing pollutants from runoff into natural water systems, intended to improve local water quality, reduce the severity of flood events, and minimize the overall impact of stormwater on the community.

Equity & Justice

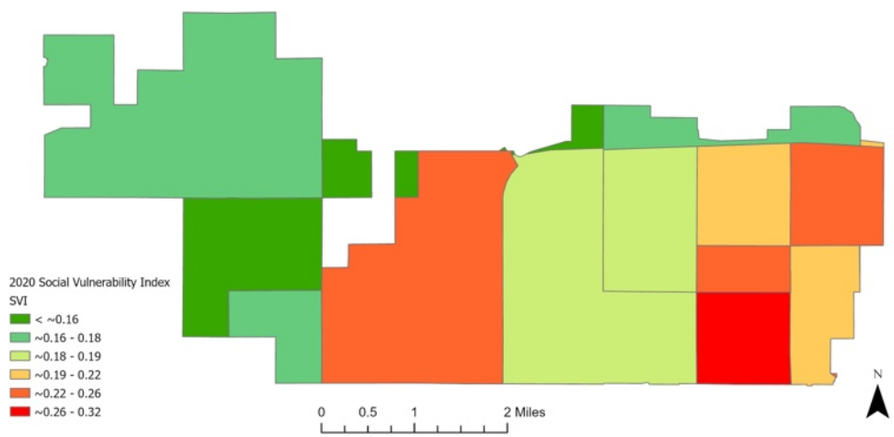
The Community Planning Studio team was committed to integrating equity and justice throughout the SUAP. Equity and justice ensure that the benefits and burdens of environmental initiatives are distributed fairly across communities, addressing historical disparities and systemic injustices. By prioritizing equity and justice, marginalized groups are empowered to actively participate in decision-making processes, ensuring that all voices are heard, and all needs are met. Cultivating inclusive and lasting change is essential to a strong sustainability plan. A sustainable future can only be achieved when equity and justice are embedded within policies and practices, fostering a harmonious balance between people, the planet, and the city.

Social Vulnerability

The 2020 Social Vulnerability Index (SVI) was calculated for Urbandale using the Human Development Index methodology (before 2010), displayed in Figure 1.10. The SVI varies from 0 to 1, 0 being very low vulnerability and 1 being very high vulnerability. The eight selected variables below were used to create the index and were gathered from literature on social vulnerability to climate change:

- Percentage of people in poverty
- Percentage of people unemployed
- Percentage of housing burden
- Percentage of people with no high school diploma
- Percentage of people 65 and older
- Percentage of people 17 and younger (
- Percentage of people who speak English "less than well"
- Percentage non-white

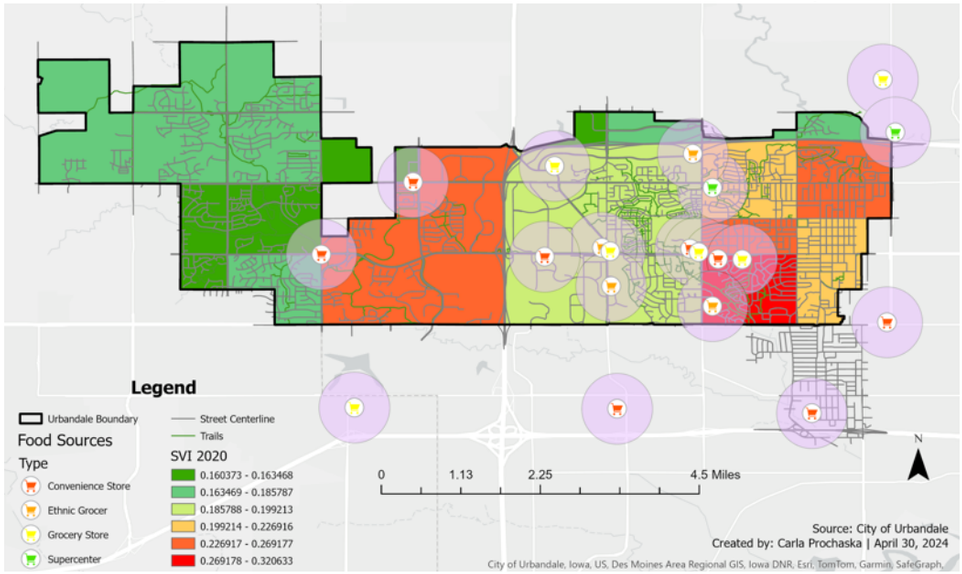
Figure 1.10 2020 Social Vulnerability Index (SVI)



Source: Calculated by the CRP 432 students

The map shown in Figure 1.11 highlights the different food sources in Urbandale, including their service areas. Using a 1-mile buffer, these service areas were identified. The 1-mile buffer was selected because it is the less conservative measure used by the United States Department of Agriculture (USDA) to define food deserts. This map helps to identify areas lacking access to healthy and affordable food, known as food deserts. Food deserts have many harmful effects on communities, including increasing health risks, increasing carbon emissions, and harming economic development. By identifying food deserts, Urbandale can prioritize targeted intervention for grocery store development in underserved and socially vulnerable areas.

Figure 1.11 Grocery Store Service Areas and Social Vulnerability



Source: Calculated by CRP 432 students

STRUCTURE OF THE SUAP

The Vision

The City of Urbandale is an innovator in low-carbon solutions across Central Iowa. Urbandale members prioritize the environment while being mindful of resources, fostering a community where people and nature thrive.

Outlining the Goals

Urbandale is committed to creating and supporting comprehensive sustainability goals and actions. The SUAP includes numerous factors to bolster impactful and achievable goals and actions that benefit the city, its residents, and its businesses the most.

Table 1.1 summarizes all of the SUAP's goals, divided by their respective chapter. There are four chapters in total, describing different goals that were inspired by the selected sustainable development codes. Throughout the plan, the goals are listed alphabetically, and their associated actions are labeled numerically.

Table 1.1 SUAP Goals

PEOPLE	RENEWABLE ENERGY	NET-ZERO ENERGY BUILDINGS	INFILL DEVELOPMENT	
GOAL(S):	**GOAL(S):**	**GOAL(S):**	**GOAL(S):**	
Goal A: Increase awareness about sustainable practices and education opportunities focusing on low-carbon solutions.	**Goal B:** Expand the availability and usage of solar renewable energy to reduce future greenhouse gas emissions. **Goal C:** Reduce fossil fuel usage for all buildings' energy consumption.	**Goal D:** Ensure that new commercial and industrial buildings maximize energy efficiency through weatherization. **Goal E:** Retrofit existing buildings to reduce energy consumption.	**Goal F:** Integrate nature-based solutions into built environments to support sustainable urban growth. **Goal G:** Enhance ecosystem services as a critical component of resiliency, promote biodiversity, and protect environments from the effects of urbanization.	**Goal H:** Increase access to walking and biking infrastructure to reduce carbon emissions. **Goal I:** Improve access to nutritious, affordable, and culturally desirable food for all. **Goal J:** Promote land-use development patterns to improve the utilization of assets in the built environment.

Throughout the SUAP, each of the goals are organized with pillars of support. This allows each action to follow a clear pathway in achieving the desired outcome.

- **The Big Picture:** Each goal defines a problem statement and solution. The 'Big Picture' describes why the goal was created and the plan's overarching intention for change.
- **UN Sustainable Development Goal(s):** The UN Stainable Development Codes provide guidance to each goal to maintain inclusive and comprehensive sustainability strategies.
- **Sustainable Development Code(s):** The Sustainable Development Codes identify best practices for community development and removing environmental obstacles
- **Co-Benefits:** The 'Co-Benefits' identify positive intersectionality among the goals.
- **City Assets:** The goals identify existing city assets within Urbandale that can help progress the implementation of its various actions.

After the goal is entirely defined, each action is structured with various features to ensure stability and consistency. This approach enables the efficient allocation of resources, minimizes potential obstacles, and ensures that every step is purposeful and aligned with the overall goal.

- **Funding:** For the actions that require funding, potential opportunities are paired, based on research and inspiration from other cities (see Appendix D).
- **Case Study:** Some actions take inspiration from research and the student's travel events.
- **Community Engagement:** For every action, the SUAP describes how the community is going to be involved in the implementation process.
- **Equity & Justice:** Every action highlights the importance of justice describing how the action will advance equity.
- **Monitoring Success:** Each action will be monitored by one, or more, quantitative and qualitative metric.

Timeline

The SUAP outlines each goal into achievable timeframes. This allows the City of Urbandale to accurately meet targets and gauge the plan's success. Following the format set forth in the *Urbandale Comprehensive Plan*, the SUAP identifies timelines for goals on the following basis:

'S' = Short-Term (1-2 years)
'M' = Mid-Term (3-5 years)
'L' = Long-Term (5+ years)
'O' = Ongoing (Requires immediate action and continued attention throughout the life of the plan)

Mitigation and Adaptation

The SUAP is designed as a multifaceted and comprehensive action plan, incorporating both mitigation and adaptation strategy types. This approach ensures a thorough and adaptable framework, addressing multiple dimensions and needs of the city. The distinction of each action is noted within the action sentence.

Mitigation involves actions aimed at reducing GHG emissions and fostering eco-friendly practices. It encompasses strategies like transitioning to renewable energy sources, enhancing energy efficiency, promoting afforestation, adopting sustainable land use practices, and implementing waste management solutions. Mitigation efforts are important to local communities that aim to minimize environmental impact, promote resource efficiency, and foster a resilient future.

Adaptation involves strategies and actions that enhance resiliency to environmental changes and promote sustainable development practices. It encompasses measures to reduce risks, address vulnerabilities, and build the capacity to withstand and respond to various environmental challenges, such as extreme weather events, water scarcity, biodiversity loss, and resource depletion.

INTRODUCTION

This section focuses on initiatives designed to increase awareness and accessibility, ensuring that knowledge becomes a catalyst for sustainable action. Through education and collaboration, Urbandale will empower its residents with the knowledge and tools needed to create a more sustainable and resilient city. By utilizing the collective power of education and outreach, Urbandale is paving the way for a more resilient and sustainable future for generations to come.

To Better Understand People Goal:

This section is intended to ease the understanding of the *People Goal*. Below is a brief glossary with critical terms and their definitions.

- *Carbon footprint:* The total amount of greenhouse gases produced to support human activities directly and indirectly.
- *Green business incubator:* A program that supports the development of new environmentally sustainable businesses.
- *Green economy:* An economy that aims for sustainable development without degrading the environment, focusing on green jobs and low-carbon technologies.
- *Green jobs:* Employment opportunities focused on promoting environmental sustainability by reducing pollution, conserving resources, and advancing renewable energy.
- *Greenhouse gas emissions (GHG):* Gases like carbon dioxide and methane that trap heat in the atmosphere, contributing to global warming.
- *Infill development:* Developing vacant or underused parcels within existing urban areas rather than expanding outward.
- *Low-carbon solutions:* Reduces greenhouse gas emissions. They include using renewable energy, improving energy efficiency, and adopting sustainable practices. The goal is to lower our carbon footprint and help the environment.
- *Net-zero energy buildings:* Buildings that produce as much energy as they consume, usually through renewable energy sources.
- *Renewable energy:* Energy from sources that are naturally replenishing. This includes solar energy, wind energy, geothermal energy, etc.
- *Sustainable development:* Development that meets the needs of the present without compromising the ability of future generations to meet their own needs.
- *Sustainable practices:* Methods of using resources that do not deplete them and can support long-term environmental health.
- *Urban sprawl:* When a city spreads outwards, taking up more and more land. This often means more houses farther apart, more roads, the loss of natural resources, and an increasing distance between homes and necessary amenities.

PEOPLE GOAL A

Goal A: Increase awareness about sustainable practices and education opportunities focusing on low-carbon solutions.

The Big Picture: As Urbandale expands outward, the city, its residents, and businesses may face challenges like higher infrastructure costs, loss of natural resources, and increased greenhouse gas emissions. To combat these issues and foster a more sustainable future, Urbandale will raise awareness about sustainable practices and education opportunities focused on low-carbon solutions. Engaging directly with the residents of Urbandale is a crucial aspect of furthering sustainability at the community level. Along with general education opportunities, Urbandale supports local economic growth through business startup assistance and job training programs focusing on sustainable development. By empowering residents with knowledge about environmentally friendly solutions, Urbandale collectively works to reduce the carbon footprint and maintain a sustainable city.

UN Sustainable Development Goal(s):

Sustainable Development Code(s): Net-zero energy buildings, promote renewable energy with incentives, and encourage infill development.

Co-Benefits: Entrepreneurship, community development, future prosperity, partnership formation, and barrier reduction.

City Assets: Urbandale can implement some of the actions described below during a few of their community events. First, Urbandale can use the Party in the Park event to host workshops or set up kiosks to teach residents the most effective ways to reduce energy, save resources, and integrate low-carbon solutions through actionable goals. These kiosks

can offer fun activities that relate to sustainability, like recycling games, seed bomb making, and using the carbon footprint calculator. When offering these activities and education opportunities, it is important to think about the refugee and immigrant community. The Urbandale NGOs and translators will also be made aware of these events and opportunities so that all residents can access and understand the information provided. Party in the Park brings much of the community together and can be a great opportunity to increase awareness about sustainable practices and education opportunities about low-carbon solutions.

Second, Urbandale can also further utilize its annual Sustainability Fair event. The city can host vendors and organizations that share information, resources, and activities to help educate residents on sustainability. This event can serve as an opportunity to learn about nature-based solutions and the importance of ecosystem services. The Sustainability Fair allows the City of Urbandale to achieve its goal of increasing awareness about sustainable practices and education opportunities about low-carbon solutions.

Connection to Existing Plans: This goal relates to one of Urbandale's overarching planning themes. In the *Forward Urbandale Comprehensive Plan*, environmental stewardship is the first planning theme. It is the city's community-wide focus built on sustainability outreach and education for resiliency. It represents the belief that all people, regardless of race, ethnicity, or economic status, have the ability to enjoy the benefits of environmentally related actions. This can only be achieved by coordinated efforts between the public and private sectors along with impactful community engagement. By utilizing the actions in this chapter, Urbandale can achieve environmental stewardship, promote the protection of natural resources, and ensure that its growth is responsible and sustainable for all people. This focus on people in sustainable, city-wide actions will foster a resilient Urbandale community that thrives.

Learning from Data

During the focus groups, several themes and needs were identified that the participants do not feel the community has addressed. Some participants expressed difficulties finding a job when first moving to Urbandale, or even now. Several participants have lived in the city for many years, and they are still struggling to find a consistent job.

I am still applying for jobs, so I don't have any job right now.

The language barrier and differing levels of education presented an obstacle to being able to communicate effectively with the community that they are a part of. This caused feelings of isolation from the community and the decisions made that could impact them.

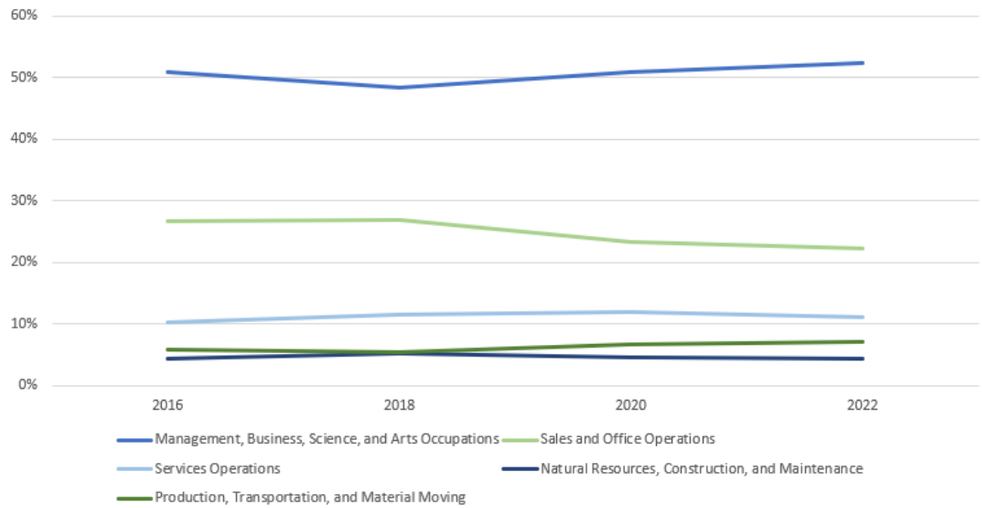
Because of the language barrier, we aren't really involved with the community and what they do.

Some of the participants also expressed concern about the language barrier and how it may impact their children and the resources that they are able to receive. Urbandale is a new and unfamiliar environment to some of these participants, and without access to proper communication and interpretation, they are worried that they are not receiving all of the necessary information.

Problems with translation and interpretation issues with the Burmese with the school districts and the city, especially when communicating with where their children are able to go to school.

Figure 1.12 represents Urbandale's economy in general and what industries are experiencing the most employment from 2016 to 2022. In an economy developing new green technologies, primary sector jobs include management, business, science, and arts occupations, which are the biggest industries in Urbandale, around 50%. These industries can reap the benefits of new green technologies to further advance the industry along with being more environmentally sustainable. Tracking this change can show how new technology shapes the job market.

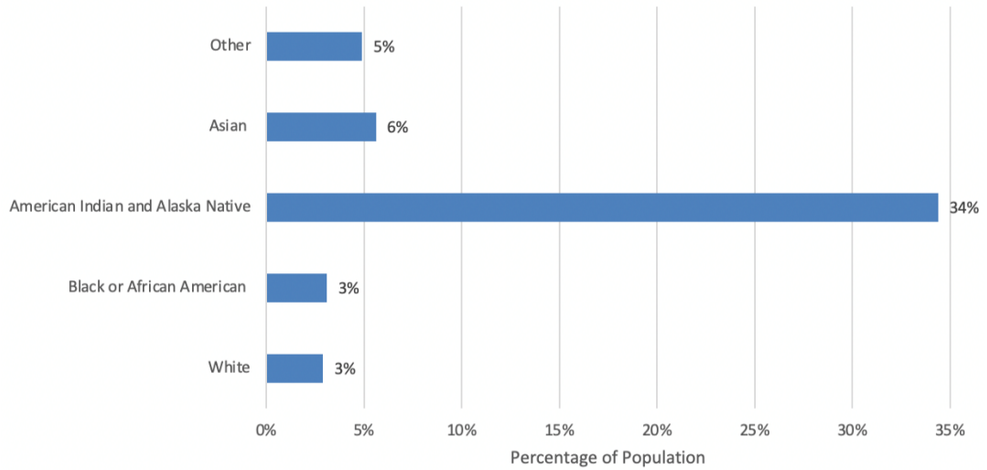
Figure 1.12 Urbandale Employment by Industry 2016 to 2022



Source: 5-Year Estimate 2016-2022 ACS, U.S. Census Bureau

Understanding the racial composition of Urbandale's workforce is crucial when discussing sustainable practices and educational opportunities for low-carbon solutions. Figure 1.13 depicts the relationship between unemployment rates in Urbandale and the city's racial groups. Urbandale's unemployment rate is highest for American Indians at 35%. This is a prime population for targeted intervention. By examining employment demographics, we can identify disparities and ensure that the benefits of green initiatives reach all communities. Acknowledging racial diversity in employment also enables tailored educational programs that address specific needs and challenges faced by different racial groups, fostering a more inclusive and effective approach to sustainability.

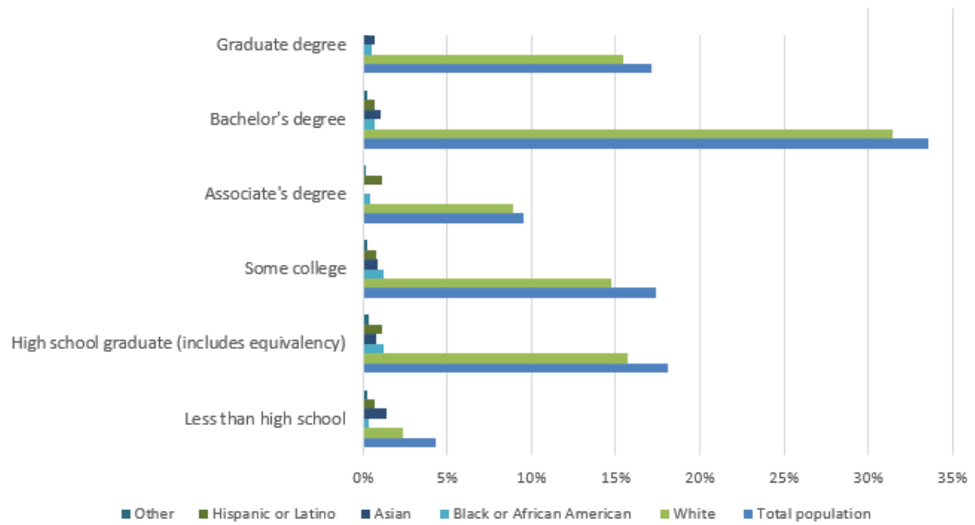
Figure 1.13 Urbandale Unemployment by Race 2019



Source: 5-Year Estimate 2019 ACS, U.S. Census Bureau

Figure 1.14 shows the educational attainment of Urbandale residents in 2021. Educational attainment is an important indicator of human capital, as it can help show workforce development. In the context of a green economy, it can represent the knowledge and skills needed for green innovation, promote sustainability, and foster a new job market for green jobs. Roughly, 37% of Urbandale's residents have not obtained any sort of college degree. This can make finding employment and job opportunities much harder for this specific population. Green jobs are a great solution as they don't require a particular degree but instead provide training and seminars in building and energy trades. It supports the growth of Urbandale's green economy while also creating employment opportunities for those who cannot attain higher education.

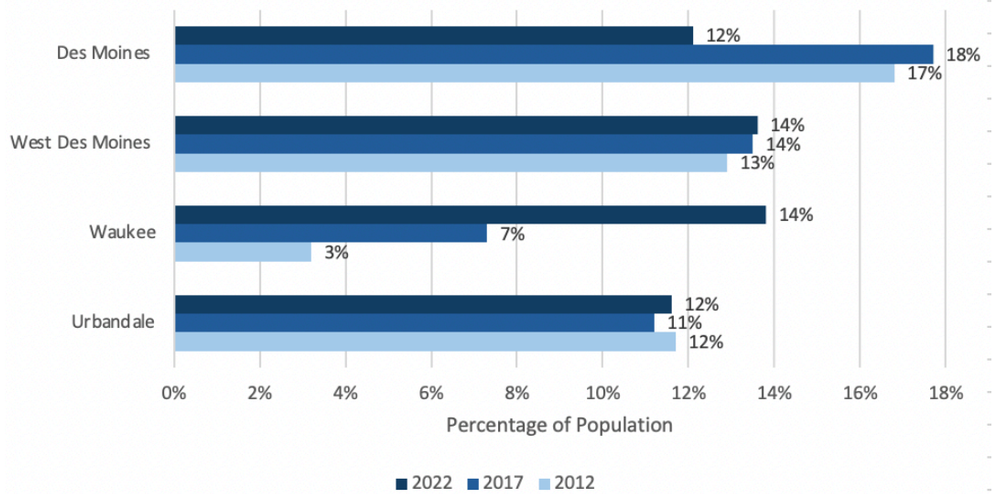
Figure 1.14 Urbandale Highest Education Attainment 2021



Source: 5-Year Estimate 2021 ACS, U.S. Census Bureau

Knowing the number of residents potentially impacted by a language barrier is important to supporting inclusivity. The percentage of other languages spoken in the Des Moines Metro is shown in Figure 1.15. As of 2022, almost 12% of Urbandale's population speaks a language other than English. The language barrier makes it harder for this group of people to receive information, especially about sustainability and low-carbon solutions. Communication is essential for engaging with diverse communities and ensuring that green initiatives are understood and accessible. This information can create pathways to establish green employment opportunities for residents with diverse linguistic backgrounds in Urbandale.

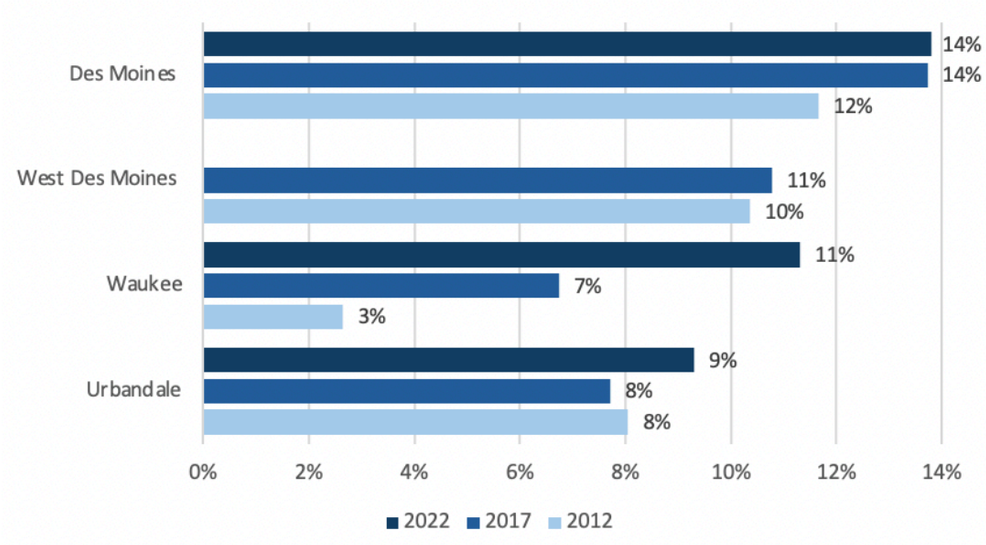
Figure 1.15 Language Spoken Other Than English in the Des Moines Metro 2012-2022



Source: 5-Year Estimate 2012-2022 ACS, U.S. Census Bureau

Knowing the foreign-born population in Urbandale is important for promoting cultural diversity, addressing environmental justice, having immigrant/refugee contributions to the green economy, facilitating community engagement, and fostering a global perspective to innovate local sustainability efforts. The growing population of foreign-born residents in the city can also offer unique economic and employment ideas. A little over 9% of Urbandale's population is foreign-born and likely faces challenges that most of the population does not face, as shown in Figure 1.16. It is important to consider the challenges for this population when including equity and justice in the sustainable goals that Urbandale implements.

Figure 1.16 Foreign-Born Population in the Des Moines Metro 2012-2022



Source: 5-Year Estimate 2012-2022 ACS, U.S. Census Bureau

ACTIONS FOR GOAL A

Action A1: Create and fill a sustainability coordinator position (long-term, adaptation).

The Urbandale Sustainability Coordinator works within the city to implement the goals and actions stated in the Sustainable Urbandale Action Plan (SUAP). Their role includes policy development, program implementation, community engagement, collaboration with other organizations, and data monitoring and reporting. In Urbandale, a sustainability coordinator could more effectively manage, implement, and monitor actions from the Sustainable Urbandale Action Plan.

This action will greatly increase education and awareness in the community. Additionally, this can further prioritize sustainable initiatives and the co-benefits that they provide. Therefore, this action should be the top priority, and the rest of the actions follow.

Potential Partners: None.

Funding: No specific funding source was identified for Action A1.

Community Engagement: The Urbandale Sustainability Coordinator is the liaison between the SUAP's goals/actions and the residents of Urbandale. They will communicate with residents and take all feedback into consideration through social media forums and surveys located on the city website.

Equity & Justice: The city will interview a diverse pool of applicants for the sustainability coordinator position. Advertisements for the position should be shared with the rest of the country. This allows local and out-of-state residents to be notified of the new opportunity.

Monitoring Success of Action A1:
Quantitative Metrics: 1) Date when the position was filled. 2) Tracking annually how many actions/goals in the SUAP are set in motion by the new position.

Qualitative Metrics: City Council and resident feedback on the productivity and usefulness of the position through open forums and a first-year review.

Action A2: Enhance the city website to provide residents easy access to sustainable practices and low-carbon solutions (short-term, adaptation).

An enhanced city website provides residents easy access to sustainable practices and low-carbon solutions. Information on the website will include ways for residents to incorporate renewable energy, learn more about conservation, and begin to understand infill development in their community. The enhanced website includes a user-friendly interface, diverse information, localized content, interactive tools, case studies and success stories, educational resources, partnerships, and a feedback mechanism. It serves as a comprehensive resource for residents.

Potential Partners: Urbandale Chamber of Commerce.

Funding: This action does not require funding.

Community Engagement: The city will post public forums or webinars to gather input on desired features and content for the portal. The forums and webinars encourage the public to share ideas, suggestions, and feedback openly. Urbandale's social media platforms will be utilized to promote the portal and receive feedback via comments.

Equity & Justice: Urbandale will enhance the city website for equitable distribution of resources. This ensures that the information is easily accessible to all Urbandale residents. With the immigrant and refugee communities in Urbandale, the website must have the option to be translated into different languages common to the residents in the city.

Monitoring Success of Action A2:
Quantitative Metrics: 1) Number of unique visitors to the online portal per month. 2) Number of downloads of the resources and tools available on the portal.

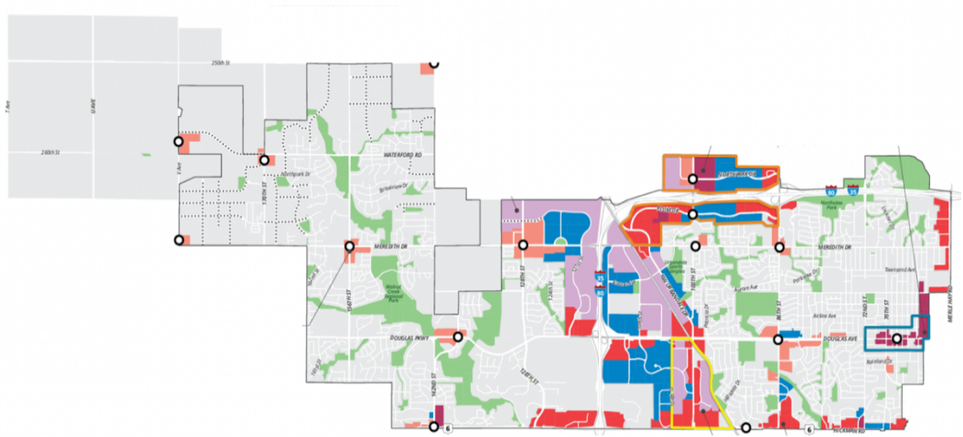
Qualitative Metrics: 1) Feedback mechanism offered on the website for residents to comment about the usability and effectiveness of the portal. 2) Testimonials collected from resident focus groups on the impact of the portal on their awareness and action related to sustainability.

Action A3: Partner with other organizations to develop a green business incubator (mid-term, adaptation).

A green business incubator is a specialized facility or program designed to support and nurture the development of environmentally sustainable businesses. It will provide support services, access to resources, networking opportunities, education, training, and access to funding. Regarding low-carbon solutions, it aims to reduce overall carbon emissions in the community. This will be most commonly done with renewable resources and energy efficiency in buildings and homes.

An Urbandale green business incubator should be implemented into the Urban Loop. The Urban Loop is a premier location for future business parks and industrial development. Having the green business incubator in this area will allow it to be in the same area as new businesses and developments, providing easy access to information about environmentally sustainable business practices. Figure 1.17 highlights potential areas within the Urban Loop for green business incubators. These areas are shown in blue, designated as 'Office/Business Park', and in purple, designated as 'Industrial'.

Figure 1.17 Green Business Incubator Potential Locations



Source: Forward Urbandale Comprehensive Plan

Potential Partners: Urbandale Chamber of Commerce, MidAmerican Energy, Iowa Economic Development Authority.

Funding: The Redevelopment Tax Credit (RTC) for Brownfield or Greyfield Sites.

Case Study: The City of San Francisco, California, has a Green Business Incubator that recognizes businesses working towards environmental sustainability, shown in Figure 1.18. The incubator offers guidance on regulations and other renewable energy programs, rebates and pre-bates, and other services for area businesses. It also provided services tailored to the needs of startups, including mentoring, assisting in funding and networking, and conducting workshops.
Source: Green business incubators, 2022.

Figure 1.18 Green Business Incubator

Community Engagement: Urbandale will host information sessions and workshops for aspiring entrepreneurs in Urbandale. It will solicit input from local residents and businesses on the services and resources they would like to see offered by the incubator. This input can be gathered through surveys, focus groups, city meetings, and feedback mechanisms offered on the city website. The city will also engage with community organizations to raise awareness about the benefits of green business development.

Equity & Justice: The city will develop a green business incubator to support sustainable business growth and provide inclusive entrepreneurship and economic development opportunities in Urbandale. This will reduce the barriers to becoming a business owner. It also contributes to creating inclusive and sustainable employment opportunities for the socially vulnerable communities in Urbandale. Partnerships with Urbandale NGOs can allow non-English speaking residents to benefit from the incubator as well.

Monitoring Success of Action A3:
Quantitative Metrics: 1) Number of startups accepted into the incubator program. 2) Percentage of startups that successfully graduate from the program. 3) Number of jobs created by startups within the incubator.

Qualitative Metrics: 1) Feedback from startups on the effectiveness of the services provided collected by comments made on social media pages. 2) Perception of the incubator's contribution to the local green economy by key stakeholders collected through an optional form located at the green incubator.

Action A4: Partner with local organizations and education institutions to organize workshops and seminars on sustainability and low-carbon solutions (mid-term, adaptation).

These workshops and seminars can be introduced to the public through the city events, Party in the Park and the Sustainability Fair. These partnerships will also make sustainability related information more easily accessible for Urbandale residents and will allow for a deeper understanding to be obtained. During the workshops and seminars, the greenhouse

gas emission inventory is shared so that residents can continue to keep up with the progress.

Potential Partners: Des Moines Area Community College (DMACC) and the Urbandale Chamber of Commerce.

Funding: The Environmental Workforce Development and Job Training (EWDJT) Grant and The Workforce Training and Economic Development (WTED) Fund.

Case Study: The City of Iowa City has an Environmental Education Center that provides a test site for environmental technologies, while acting as a community center focused on education, displayed in Figure 1.19. They have virtual resources on waste reduction, landfilling, composting, recycling, and environmental protection. Residents can also access facts about Iowa City on their website, including community-wide emissions by sector. Their Environmental Education Center also makes learning about sustainability fun by offering activities and handing out eco-friendly gifts, like vegan chapstick. This center has made learning about sustainability and environmental production more engaging and accessible to the community.
Source: Facilities and rentals, n.d.

Figure 1.19 Iowa City's Environmental Education Center

Community Engagement: The city will conduct surveys to gather input from residents on topics of interest for workshops. They will also host interactive sessions where residents can share their experiences and ideas for sustainability initiatives. The workshop will be promoted, and feedback will be gathered using the city's social media platforms.

Equity & Justice: The city will provide workshops and seminars on sustainability and low-carbon solutions to empower Urbandale residents through education. Contact with the NGOs in Urbandale is essential to ensure the information at these workshops/seminars is accessible to all populations in the city. Having translators and interpreters will allow the non-English speaking residents to understand the information being presented, which is roughly 12% of Urbandale's total population. The city can also implement one-day events distributing energy-efficient products to socially vulnerable areas.

Monitoring Success of Action A4:
Quantitative Metrics: 1) Number of workshops and seminars organized per year. 2) Attendance rates at workshops and seminars. 3) Percentage change in awareness about sustainability issues and low carbon solutions, measured by pre- and post-event surveys.

Qualitative Metrics: 1) Feedback from workshop participants on the relevance and usefulness of the information provided, measured by an optional post-event commentary form. 2) Testimonials from residents on behavioral changes or actions taken after attending workshops and seminars, measured by focus groups.

Action A5: Partner with other organizations to provide green jobs training to enhance the labor workforce (mid-term, adaptation).

Green job training refers to programs and initiatives designed to equip individuals with skills, knowledge, and qualifications to work in sustainable industries or occupations. These training programs focus on preparing workers for careers that contribute to environmental protection, resource conservation, and the transition to a low-carbon economy. Some examples of green jobs include waste management, solar and wind turbine service technicians, green construction, forest and conservation workers, energy consultants, etc. Green jobs are becoming more relevant in today's economy and green job training can provide opportunities for Urbandale residents to find a career in the field. It can also further connect Urbandale residents to renewable energy and the implementation of those energy sources into their community.

Potential Partners: Iowa Department of Natural Resources (DNR), DMACC, Iowa State University Extension, Community and Economic Development.

Funding: The Energy Efficiency Conservation (EEC) Block Grant.

Community Engagement: Consultations with stakeholders, residents, local businesses, and other organizations will provide valuable insights into the specific needs and priorities of the community regarding green jobs training.

Equity and Justice: The city will partner with local workforce development organizations to support green job training and job placement opportunities to socially vulnerable residents. Green jobs training creates inclusive economic development by creating pathways to employment for individuals in Urbandale from diverse backgrounds.

Monitoring Success of Action A5:
Quantitative Metrics: 1) Total count of green jobs training initiatives launched within the specified timeframe. 2) Number of individuals engaging in the training programs. 3) The proportion of trained individuals successfully securing green job placements post-training.

Qualitative Metrics: Collect feedback/comment forms after all of the green job training from participants assessing the relevance, quality, and impact of the programs.

Action A6: Launch and publicize the game Renewable Rescuers to allow for fun and free education on renewable resources and sustainability (short-term, adaptation).

Renewable Rescuers educates players on renewable energy, net-zero energy buildings, infill development, and their benefits. It offers a fun way to explain complex sustainability concepts to young Urbandale residents. The target audience is middle and high school students, 11-18 years of age, and it will be free to play.

Potential Partners: None.

Funding: No specific funding source was identified for Action A6.

Community Engagement: The city will allow for game feedback and comments through surveys posted on the city's social media platforms.

Equity and Justice: The game is free and easily accessible. This ensures all Urbandale residents have access to Renewable Rescuers, regardless of socioeconomic status, for free education on renewable resources and sustainability. This helps bridge the gap between those who can afford expensive educational materials and those who cannot.
Monitoring Success of Action A6:
Quantitative Metrics: 1) Track the number of game downloads from app stores or websites where it is available. 2) Monitor the engagement metrics–likes, shares, and comments–of social media posts related to the game and its launch. 3) Assess players' knowledge gain on renewable resources and sustainability through pre- and post-game surveys.

Qualitative Metrics: Gather feedback and reviews from players through the app or comments on the city's social media.

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Chapter 2: Renewable Energy
SUSTAINABILITY AT THE LIBRARY
Welcome!
UNIQUELY URBANDALE
Chamber

INTRODUCTION

For many American cities, the expansion of renewable energy use is considered a foundation to increase sustainability. Renewable energy typically refers to energy generated from lasting resources such as solar, wind, or geothermal—these sources are not depleted by their use. By prioritizing renewable energy sources, carbon emissions will be reduced. This opens a door for localized energy production and paves the way for a more sustainable future. The City of Urbandale will be committed to reducing reliance on fossil fuels for all residential, commercial, and industrial buildings' energy consumption. In 2020, Urbandale generated a total of 504,668 metric tons of carbon dioxide equivalent (CO2e) emissions (Urbandale GHG Report, 2020).

By implementing innovative strategies and adopting energy-efficient technologies, the city will diminish its carbon footprint associated with the built environment. It is understood that the key to achieving lasting change lies in embracing renewable energy sources. By harnessing power from wind, solar, and other clean energy sources, Urbandale can promote sustainable economic growth while ensuring healthier, and more resilient energy infrastructure for all its residents.

Guided by innovation, collaboration, and a steadfast commitment to sustainability, Urbandale prioritizes achieving renewable energy goals. Through partnerships with local stakeholders, businesses, and residents, Urbandale will leverage its collective expertise and resources to drive meaningful progress toward a renewable future. Urbandale aims to reduce energy consumption and minimize its GHG emissions by capitalizing on renewable energy sources to enhance the community's sustainability and well-being.

To Better Understand this Chapter

This section is intended to ease the understanding of the *Renewable Energy* chapter. Below is a brief glossary with critical terms and their definitions.

- *Accessory dwelling units (ADUs):* ADUs are smaller, independent residential dwelling units on the same lot as single-family units, typically rented to small households or used for various family stages.
- *Backdraft:* Backdrafts occur in enclosed spaces when combustion appliances consume the available oxygen and home appliances, like exhaust fans, pull the combustion gases back into the living space.
- *Commercial building:* A structure used in industrial, retail, business, or public uses that is not residential or governmental.
- *Density bonus*: This incentive allows developers to increase the maximum allowable development for a proposed project, as defined by a local zoning code, in return for support for specified public policy goals.
- *Economies of scale:* This refers to the economic principle that larger productions have a lower overhead expense per unit and thus are cheaper to operate than smaller productions.
- *Energy audit:* An energy audit is the process of measuring a building's energy usage and creating a checklist for property owners that will assist in increasing energy efficiency. An audit can reveal air leaks; backdrafts; insulation levels; heating and cooling equipment lifespan; lighting efficiency; and appliance and electronic efficiency (Do-It-Yourself Home Energy Assessments, 2024).
- *Fossil fuel:* Fossil fuels include oil, coal, and natural gas. These non-renewable resources are extracted to be used as energy sources, burned to produce electricity, or refined for heating and transportation.
- *Geothermal districts:* Geothermal districts use wells, piping, and pumps to pull the Earth's heat from the ground to warm buildings in winter and pull heat from the buildings back into the ground in summer to cool them.
- *Geothermal energy:* Geothermal energy is heat derived from the Earth, used for power generation and heating appliances.
- *Greenhouse gases (GHG):* Greenhouse gases such as carbon dioxide, methane, nitrous oxide, and fluorinated are gases that trap heat within the atmosphere.
- *Greenhouse gas inventory:* This is a measure of emissions associated with their given source. These inventories can be done in several different ways depending on their purpose.
- *Heating and Cooling Degree Days:* This is a measure of how warm or cold a location is, based on a 65°F day. When it is 65°F outside, heating and cooling are

often unnecessary to feel comfortable inside. It compares the daily temperature average—high temperature plus low temperature divided by two.

- *Leapfrog development:* Leapfrog development occurs when developers skip over more expensive land that is closer to city centers in favor of cheaper land, often on the outskirts of town. Developers do this to save on land costs, often leading to large areas of undeveloped land in the city. This can lead to higher municipal costs and decreased access for residents who do not have reliable transportation.
- *Maker spaces:* Maker spaces are places where community members can gather to learn new skills and collaborate with other residents. They often give residents access to technology and tools to make goods. They can also include small artisan businesses such as candle making, soap making, jewelry making, low-volume screen printing, small breweries, furniture refurbishing, and re-upholstery.
- *Power purchase agreement:* A power purchase agreement is a long-term contract to purchase power and associated renewable energy certificates. This is formed between a specific renewable energy generator and a purchaser of renewable electricity.
- *Residential building:* A structure used to house people that is not commercial or governmental.
- *Resilience hub:* Resilience hubs are community-serving facilities created to support residents, facilitate communication, distribute resources, and improve quality of life by reducing air pollution.
- *Smart growth:* Smart growth is a method of development that prioritizes efficient and compact construction. Smart growth is often characterized by mixed-use, mixed-income, and walkable areas.
- *Solar Group Buy:* Solar Group Buy is a program involving a solar installation company that comes for a limited amount of time to install a large number of solar panels throughout a community. Due to economies of scale, these installations are offered at a much lower price (What is a group buy?, n.d.).
- *SolSmart:* "A national recognition and technical assistance program for local governments, which seeks to drive greater solar deployment and make it possible for more American homes and businesses to access affordable and renewable solar energy to meet their electricity needs" (SolSmart Funding Program, n.d.).

SOLAR GOAL B

Goal B: Expand the availability and usage of solar renewable energy to reduce future greenhouse gas emissions.

The Big Picture: Urbandale is a city that is rapidly growing outward. With more development comes a higher demand for energy. To balance this growth and create a more resilient future for incoming residents, Urbandale should invest in renewable energy sources. These sources are beneficial because they do not emit carbon or other greenhouse gases while producing energy, reducing GHG emissions overall. By expanding the usage of renewable energy in Urbandale, the city can create more energy independence for households and businesses to become a greener, more sustainable city.

UN Sustainable Development Goal(s):

Sustainable Development Code(s): Promote renewable energy with incentives and density bonuses for installation of solar energy panels

Co-Benefits: Energy efficiency, community development

City Assets: Urbandale can utilize city-owned property to implement renewable energy sources. First, the city can begin to work through the SolSmart certification checklist, which begins by creating requirements for residential rooftop solar. The city can install rooftop solar panels onto city-owned buildings. An informational sign can educate passersby about the addition and value of solar energy. The sign can also show a plot of electricity grid energy consumption before and after the solar installation. As the city continues to work through the certification process, it will advance its sustainable practices throughout the community, such as installing

batteries at city-owned buildings to store solar-generated energy for use on cloudy days.

Second, as Urbandale is installing rooftop solar, the city can also partner with a solar installer to receive a discounted installation bill and commit to purchasing solar panels for a set number of city buildings. The Solar Group Buy will require feasibility assessments to address the scale of the purchase. Progress on the interactions with the installer, the installation process, and energy generation should be posted on the City of Urbandale's public website to show feasibility and manageability.

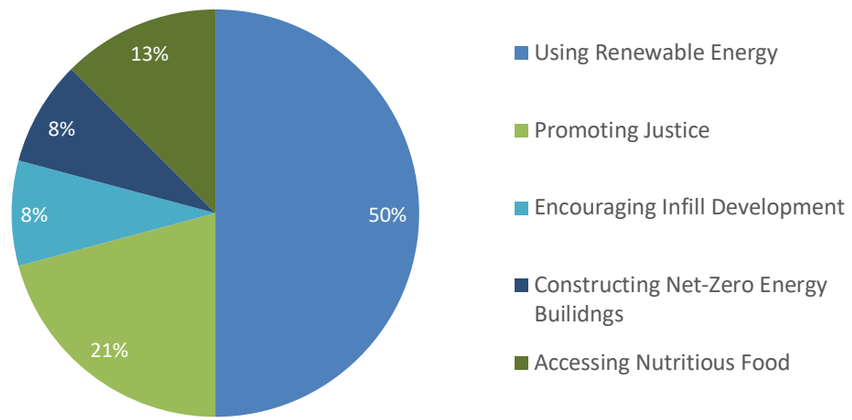
It is important to highlight the steps Urbandale has taken to reduce GHG emissions and promote the use of renewable energy. Notably, the City of Urbandale has completed a 225-kilowatt solar panel array system atop the City's Parks & Public Works Maintenance Facility. This $500,000 project positions the city as a leader in sustainable energy technology within the Des Moines metropolitan area (City of Urbandale, 2024).

Connection to Existing Plans: The *Forward Urbandale Comprehensive Plan* details smart growth to prevent leap-frog development. Buildings that engage in density bonuses to install solar panels can be located in infill lots, thereby participating in smart growth. The plan also promotes constructing accessory dwelling units (ADUs), which assist older adults to age in place. Installing solar panels on ADUs reduces the energy bill of the owner, which further incentivizes maximizing the allowable ADU square footage for construction. Downtown reinvestment is a priority that could benefit from density bonuses where solar panels are installed. The downtown can be presented as an innovative and pioneering district of Urbandale for implementing renewable energy technology. New and existing maker spaces can have high start-up and overhead costs; solar installation can reduce energy bills in the long run. If a maker space owner wants to scale up due to increasing demand and supplies of products, a density bonus fits their needs.

Learning from Data

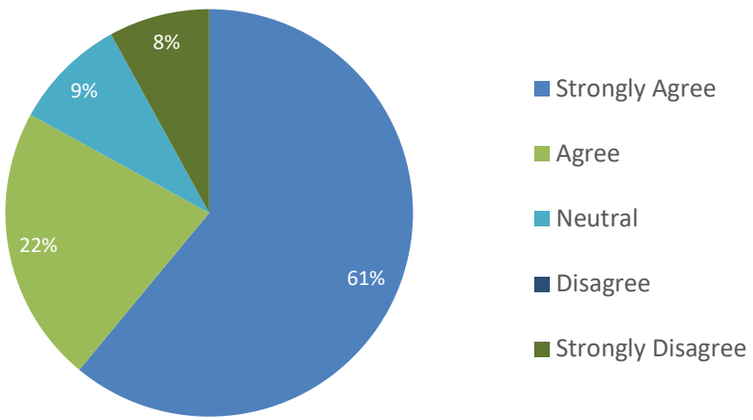
During the library event, residents were asked to rank which sustainability theme they found most important in the post-event survey. As seen in Figure 2.1, "using renewable energy" was ranked highly among respondents, as 50% made it their top choice. Renewable energy is valued in Urbandale. The city should continue to implement renewable energy technology throughout the city and increase accessibility to all residents.

Figure 2.1 Most Important Sustainability Themes



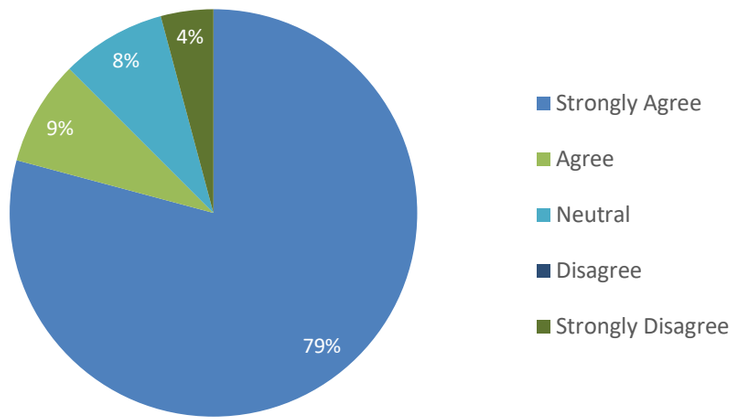
Residents were also asked whether they support the implementation of large-scale solar projects. Figure 2.2 shows that 61% of respondents strongly agree with large-scale solar implementation, making it an important asset to include in Urbandale.

Figure 2.2 Implementing Large-Scale Solar Projects



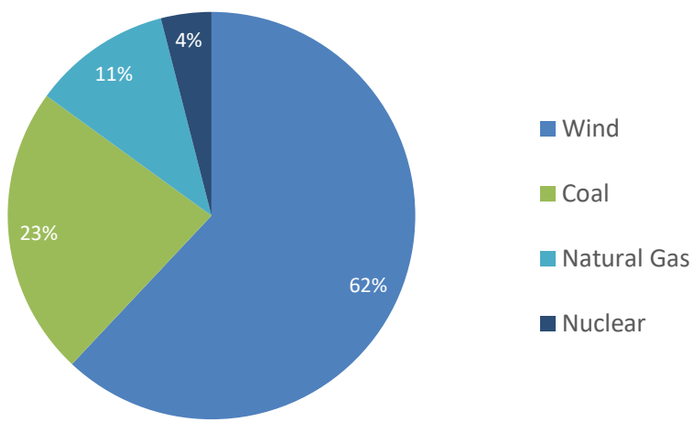
Additionally, residents were asked if they support renewable energy technologies for low-income households, as seen in Figure 2.3. A majority, 79%, would support renewable energy sources for low-income households. These results demonstrate widespread support for sustainable, low-income energy technologies. Urbandale should prioritize accessibility in socially vulnerable areas throughout the implementation process of renewable energy.

Figure 2.3 Renewable Energy Technologies for Low-Income Households



MidAmerican Energy provides a breakdown of the company's overall power generation, shown in Figure 2.4. MidAmerican Energy does not have a breakdown that is Iowa-specific. This data covers the power breakdown for the entire company, encompassing Iowa, Illinois, and South Dakota. MidAmerican Energy is a primary energy provider for Urbandale, making this data significant to the city, as it shows how much of MidAmerican's energy is generated from renewable sources. The company effectively uses renewable energy, with wind being the primary source of 62% of all energy generated. Coal and natural gas are still widely used at 34%, showing space to expand renewable energy use.

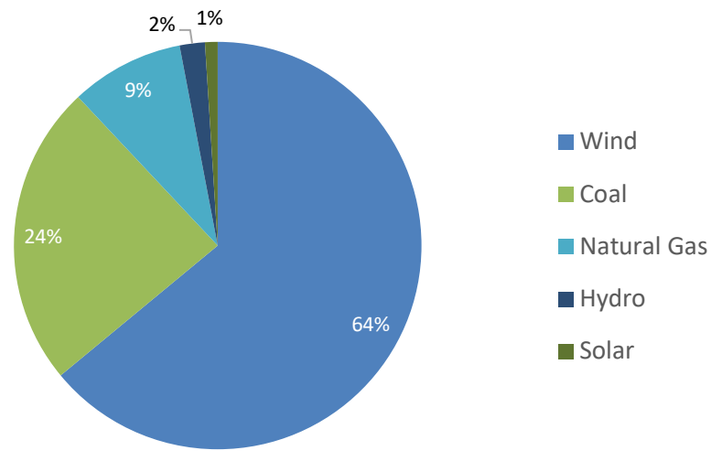
Figure 2.4 Energy Generation in Iowa, Illinois, and South Dakota



Source: MidAmerican Energy Generation Breakdown, 2023.

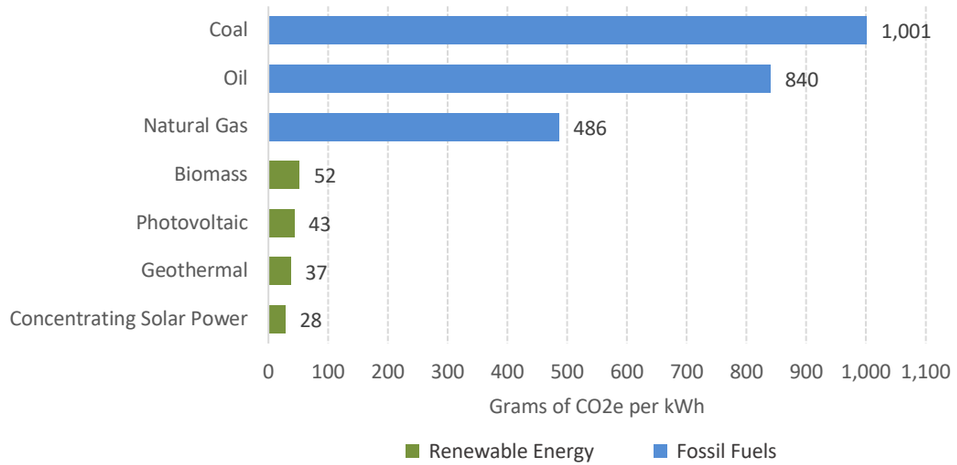
Figure 2.5 provides a visual representation of where Iowa gets its power from. In Iowa, wind energy is the most common form of power generation, at 64%. However, coal and natural gas are still significant generators of power for the state. By expanding the availability of renewable energy sources, the City of Urbandale aims to contribute to the increase in renewable power generation in Iowa.

Figure 2.5 Electric Grid Mix in Iowa



The National Renewable Energy Laboratory (NREL) recently led the Life Cycle Assessment (LCA) Harmonization Project. This study gives accurate estimates of life cycle GHG emissions for conventional and renewable energy generation. As technology advances, the NREL conducts regular assessment updates to ensure emissions information is consistently comprehensive and accurate. Shown in Figure 2.6 is the LCA update from 2021. Life cycle GHG emissions are significantly less than those from fossil fuel-based technologies. There is a 973-gram difference between the lowest and highest energy generation technology: concentrating solar power at 28 grams of CO2e/kWh and coal at 1,001 grams of CO2e/kWh.

Figure 2.6 Total Life Cycle (g CO2e/kWh): Fossil Fuel vs. Renewable Energy



Source: NREL, 2021.

ACTIONS FOR GOAL B

Action B1: Expand participation with the U.S. Department of Energy's SolSmart program to remove red tape on implementation (short-term, adaptation).

The SolSmart program is a certification program that seeks to assist municipalities that are implementing solar technology. The program has municipalities work through a checklist for various levels of certification by working through community engagement, planning practice, and technical assistance actions ("SolSmart Funding Program", n.d.). The SolSmart Bronze designation requires: a solar statement that commits the city towards pursuing solar; the checklist displays the necessary measures to get a solar permit on the city website; and the zoning review requires analyzing existing regulations that restrict solar implementation. Once Urbandale achieves a Bronze SolSmart designation, the city should continue to identify steps to achieve higher designations.

Potential Partners: U.S. Department of Energy (DOE) and MidAmerican Energy.

Funding: Local Government Energy Program: Communities Sparking Investment in Transformative Energy (C-SITE) and Environmental Protection Agency Air Grants and Funding (EPAAGF).

Case Study: The City of Iowa City received SolSmart designation level Gold in 2023. The city created a community-wide solar purchase program and updated zoning to allow for solar growth. They installed solar panels on government land and financially supported installing solar panels on low-income housing, exemplified in Figure 2.7. Notably, they provided clear regulations on solar installation in flood plains and on historic buildings. The designation gives notoriety and credentials to the city's program and values their continued effort.

Figure 2.7 SolSmart Rooftop

Source: SolSmart Funding Program, n.d.

Community Engagement: Urbandale will develop workshops that demonstrate solar feasibility and host them in public spaces. Small models will be displayed at public events to demonstrate solar feasibility without requiring travel to a test site. It is crucial to maintain a well-organized city webpage that displays event information for a wider audience and later reference. This will facilitate communication regarding improvements that have been made and what new solar programs exist.

Equity & Justice: The SolSmart Program works to establish solar energy sources equitably across communities. As part of the certification process, the city will analyze areas of the city that need additional assistance to implement solar energy and provide incentives, aid, and resources in developing renewables.

Monitoring Success of Action B1:
Quantitative Metrics: 1) Track the number of SolSmart action items completed by the city. 2) Monitor the city's progress toward achieving higher designation levels (Bronze, Silver, Gold). 3) Count the number of new residential and commercial solar panel installations.

Qualitative Metrics: 1) Gain community feedback on the implementation of the SolSmart program through meetings administered to residents, targeting socially vulnerable populations. 2) Organize focus groups to discuss community perceptions of the solar program. 3) Conduct field visits to solar installation sites to observe the implementation process and gather feedback from installers and property owners.

Action B2: Participate in a Solar Group Buy program to lower the initial costs of solar panels on residential, industrial, and commercial properties (mid-term, adaptation).

Solar Group Buy programs are offered by specific solar installation companies. A community must commit to purchasing a certain amount of solar panels, which reduces the cost as the company works in the city for a short period of time to install all of the panels. These programs work to remove cost barriers to purchasing solar panels.

Potential Partners: Midwest Renewable Energy Association (MREA), DOE, Economic Development, Chamber of Commerce.

Funding: Local Government Energy Program: Communities Sparking Investment in Transformative Energy (C-SITE) and Environmental Protection Agency Air Grants and Funding (EPAAGF).

Equity & Justice: Solar Group Buy programs help to reduce the initial cost of solar energy installation for all residents—helping to reduce the cost barriers for homeowners. Socially vulnerable areas will be identified using the Social Vulnerability Index and prioritized for solar installation. The Urbandale Chamber of Commerce can identify businesses in socially vulnerable areas and offer them participation in the group buy program.

Community Engagement: Urbandale will promote Solar Group Buy Programs at local events, like the farmers market, to reach a wide range of residents. Posters and flyers will be created to post at resilience hubs to generate dialogue and interest in the group buy programs. The city will send start up information, as well as the process of installing and maintaining solar panels to interested parties. Materials will be translated for additional languages.

Monitoring Success of Action B2:
Quantitative Metrics: Correlate the percentage of buildings with rooftop solar with the amount of total energy generated from rooftop solar.

Qualitative Metrics: Gain feedback on price, quality, and satisfaction through virtual or in-person meetings from customers who participate.

Action B3: Provide density bonuses for sites that include solar on the building and/or property (long-term, adaptation).

Density bonuses are increased density allowances for meeting public policy goals. Developers are allowed to build additional units, exceed height maximums, or reduce

parking minimums in exchange for implementing a specific amount of solar technology on-site. The bonuses must be granted through an approval process to ensure the community benefits from developer projects.

Potential Partners: Chamber of Commerce.

Funding: Local Government Energy Program: Communities Sparking Investment in Transformative Energy (C-SITE), Environmental Protection Agency Air Grants and Funding (EPAAGF), Tax Increment Financing (TIF) Districts.

Case Study: The City of McCall, ID created the Density Bonus Program. The Density Bonus Program offers a 10% density increase for any development that provides 50% or more of its power from renewable sources including solar, wind, geothermal, and other alternatives. This incentivizes developers to embrace renewable technology to increase the size or number of units in their developments. McCall applies the density bonus to planned unit developments which is a very educated implementation of the density bonus in city code, rather than as a variance.
Source: Sustainable City Code, n.d.

Community Engagement: Host community meetings in public spaces and resilience hubs with maps showing income to gather feedback from residents on where density bonuses should apply. The identified locations can be used as priority sites to target for density. Businesses should be a higher priority because they are likely to have more capital than homeowners. The City of Urbandale should support business owners with grant writing through workshops and grant writing services.

Equity & Justice: Density bonuses help to reduce energy costs to residents and place more residents closer to resources. The Chamber of Commerce can identify suitable locations using the Social Vulnerability Index and provide workshops to socially vulnerable residents on where and how they can redeem a density bonus. Business owners who have already received a density bonus can be paired with applicants to answer their questions.

Monitoring Success of Action B3:
Quantitative Metrics: Record the number of density bonuses granted.

Qualitative Metrics: Solicit community feedback of site owners and neighbors on developed projects as an ongoing part of the approval process through meetings.

MITIGATION GOAL C

Goal C: Reduce fossil fuel usage for all buildings' energy consumption.

The Big Picture: Urbandale is negatively impacted by greenhouse gases in the atmosphere. The environmental changes that occur from greenhouse gases impact utility bills and a home's ability to withstand changing weather. Through the implementation of energy-efficient actions, Urbandale residents can experience smaller variations in the amount of energy necessary to stay warm or cool in their homes as the seasons change, lowering utility costs. By promoting renewable energy sources, the city will have less GHG emissions, cleaner city-wide energy, smoother renewable energy technology implementation, lower energy bills, and valuable partnerships with financial institutions. A more energy-efficient city will improve the living conditions of Urbandale residents in both the short- and long-term.

UN Sustainable Development Goal(s):

Sustainable Development Code(s): Promote renewable energy with incentives.

City Assets: Urbandale can utilize city-owned buildings to make simple changes toward renewable and efficient energy consumption. First, Urbandale can perform an energy audit on all city-owned buildings to gain an understanding of how much energy each building

requires. With this information, the city can collect all utility bills and track energy consumption patterns with Degree Day calculations. By making city-owned buildings energy-efficient, business owners and homeowners will find such changes more feasible.

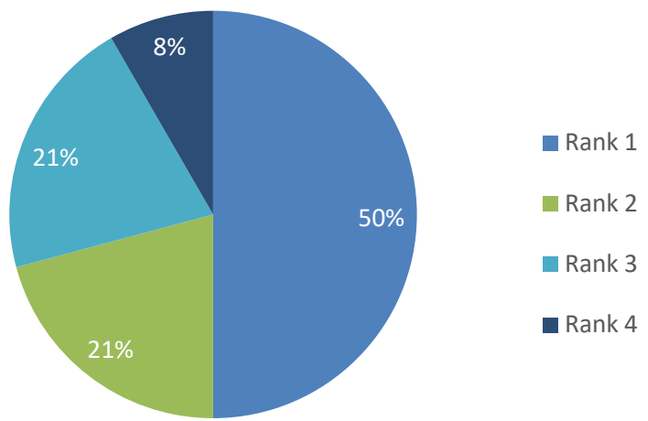
Second, Urbandale can convert all less-efficient, city-owned streetlight bulbs to LEDs. LED bulbs are brighter than the common incandescent bulbs, making them a better and safer alternative for public lighting. With such efficient lighting, the bulbs will need to be changed less frequently, the city will draw less energy from street lighting, and will indirectly reduce GHG emissions with decreased bulb production. The revenue spent on lighting maintenance and upkeep can be redirected to more pressing issues after the streetlight conversion is widespread. Urbandale can lead by example to reduce maintenance costs of city fixtures and amenities. The city can support sustainable action by advertising the financial and ethical benefits of efficient lighting for all homes and businesses.

Connection to Existing Plans: In the *Forward Urbandale Comprehensive Plan*, the City of Urbandale identifies Founding Neighborhoods, new subdivisions, and the Western Growth Area as ideal places to further energy efficiency. The Founding Neighborhoods are on the east side of Urbandale and generally house older residents. Old homes, if poorly maintained, waste energy by leaking air from poor insulation. If residents living in the Founding Neighborhoods decide to move, the *Comprehensive Plan* wants vacant buildings to be adaptatively reused and to make energy-efficient buildings more attractive to prospective property owners. In addition, there are several infill lots under Founding Neighborhoods, which can be revitalized with completely energy-efficient buildings.

Learning from Data

During the library event, survey respondents were asked to rank the use of renewable energy on a scale of one to four, with one being the highest and four being the lowest. As seen in Figure 2.8, the option of using renewable energy was ranked as the top priority for 50% of respondents. This reveals that citizens consider renewable energy use an important step toward sustainability. The city should continue to encourage and implement renewable energy sources in city-owned buildings.

Figure 2.8 Ranking Renewable Energy



During the library event, residents made an educated response after learning more about the feasibility of geothermal energy in Urbandale. When asked about converting their own home to geothermal/biomass energy in the post-event survey, 37% of respondents were likely to consider the change and 17% were very likely to switch, as shown in Figure 2.9. Many respondents remain unsure or unlikely. This demonstrates a need for more education and outreach on the benefits of geothermal/biomass energy. Overall, citizens are interested in converting their building's power source from non-renewable energy to geothermal. The data shows that geothermal energy is a valuable addition to Urbandale's energy generation portfolio and can be implemented with the support of the city's residents.

Figure 2.9 Likeliness to Switch to Geothermal/Biomass Energy

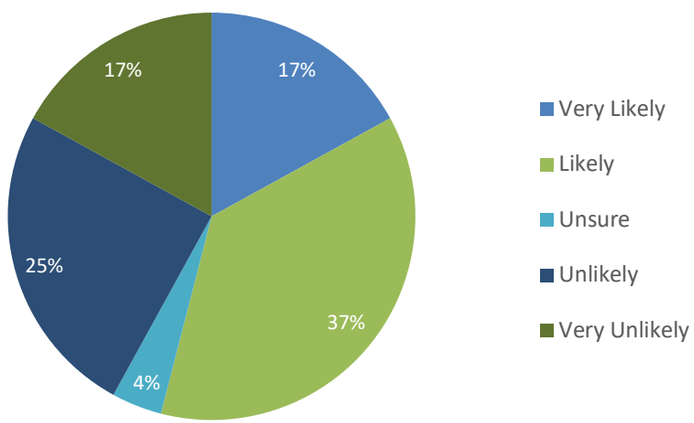
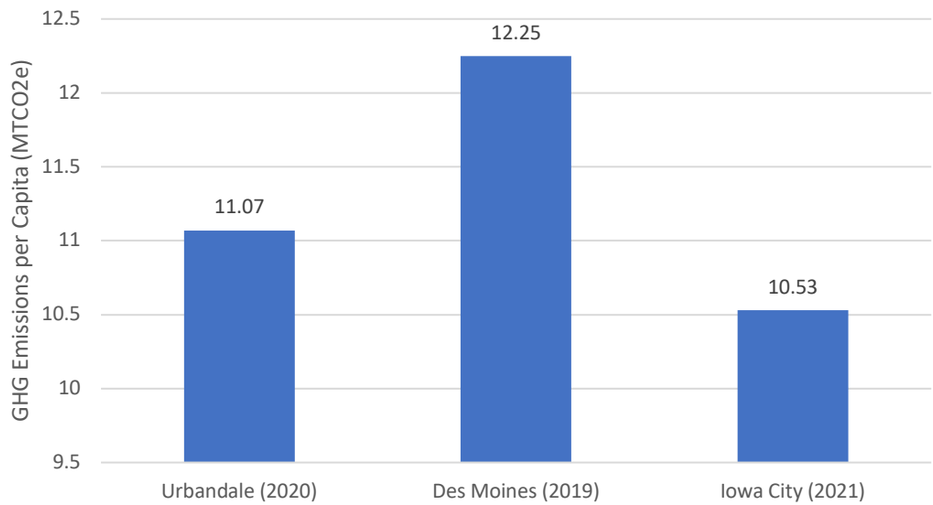


Figure 2.10 shows GHG emissions per capita in Urbandale, Des Moines, and Iowa City. This number describes the metric tons of carbon dioxide equivalent (MTCO2e) emissions for each city, per person. Measuring a city's emissions per capita is important because it reveals how much GHG, on average, each person is emitting. In 2020, Urbandale generated a total of 504,668 metric tons of carbon dioxide equivalent (CO2e) emissions (Urbandale GHG Report, 2020). Maintaining this amount of GHG emissions yearly will have adverse effects on the city and its residents. This value should be used to determine the amount of emissions Urbandale can reduce.

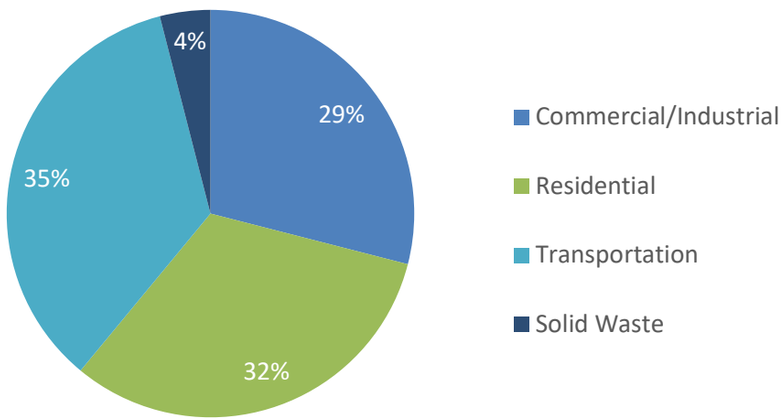
Figure 2.10 GHG Emissions Per Person



Sources: UGGER, 2022. DSMCGGER, 2019. Iowa City CAAP, 2020.

Numerous sectors add to the quantity of GHG emissions a city produces. Figure 2.11 shows the sectors responsible for GHG emissions in Urbandale. Transportation, residential, and commercial/industrial sectors contributed similar quantities of emissions to the overall inventory, varying around 30% each. With this data, Urbandale can accurately target which sectors would have the greatest impact in reducing the city's overall GHG emissions.

Figure 2.11 GHG Emissions by Sector



Source: UGGER, 2022.

ACTIONS FOR GOAL C

Action C1: Inventory GHG Emissions yearly to monitor plan effectiveness (short-term, mitigation).

Through this action, the city can use the *2020 Urbandale Greenhouse Gas Emissions Report* as a baseline for future GHG emission inventories to be compared. Yearly inventories can be made using the EPA Local Greenhouse Gas Inventory Tool, which is a spreadsheet that calculates GHG emissions on the community scale and government operations scale.

Urbandale can partner with MidAmerican and receive yearly GHG emission inventories, for a more accurate understanding of the city's emissions.

Potential Partners: MidAmerican Energy.

Funding: Local Government Energy Program: Communities Sparking Investment in Transformative Energy (C-SITE), Environmental Protection Agency: Environmental Justice (EPAEJ), Tax Increment Financing (TIF) Districts, Municipal Bonds.

Community Engagement: Urbandale will present the GHG Emission Inventory publicly to raise awareness for the plan and host an annual sustainability workshop to further education. The city will engage socially vulnerable residents with a citizen-focused program to gather annual GHG emission inventory data.

Equity & Justice: The city will install GHG sensors in socially vulnerable areas to track pollution levels. An action targeting socially vulnerable areas can address residential needs with intention and acknowledge the unique way socially vulnerable areas are affected by GHG emissions.

Monitoring Success of Action C1:
Quantitative Metrics: 1) Make annual comparisons of the GHG inventory to gauge the city's progress in lowering emissions. 2) Record air quality daily during peak transportation hours using AirNow. AirNow is an EPA-powered public service where users can input their location and receive an air quality index rating of their area. The rating indicates if the air quality is good, moderate, or poor.

Qualitative Metrics: Conduct annual interviews with residents on air quality to gather feedback on improvements and changes.

Action C2: Create an energy audit program with a checklist for improving efficiency for both residential and commercial properties (short-term, mitigation).

With an energy audit action, Urbandale's property owners will be more aware of their building's energy consumption. Per the audit's recommendations, many minor modifications can amount to major improvements; a building can have a 10-20% energy usage reduction just by sealing air leaks (Department of Energy, 2024). All property owners can opt-in to this program to increase energy efficiency and reduce energy costs. MidAmerican offers a residential and nonresidential energy audit program; the residential audit is a self-assessment, and the nonresidential program has specific requirements for qualification, such as square footage and energy costs. Business owners can receive grants to cover the cost of auditing a large space; homeowners may not need a grant unless the structure's size is comparable to a commercial building.

Potential Partners: MidAmerican Energy

Funding: Environmental Protection Agency: Environmental Justice (EPAEJ), Tax Increment Financing (TIF) Districts, Municipal Bonds.

Case Study: The City of Ames created the Ames Smart Energy Program, which is an opportunity for residential and commercial property owners to increase efficiency. By implementing renewable sources to generate clean energy, the city will reduce energy and water usage. To incentivize this, the City of Ames offers a variety of rebates, along with technical assistance to help property owners begin the transition to greater efficiency. The city has several residential programs and commercial programs. The residential program offers appliance rebates, HVAC rebates, EV charger rebates, and electric lawnmower rebates, amongst many others. The commercial programs offer similar rebate opportunities in addition to a power factor correction rebate.
Source: City of Ames, 2024.

Community Engagement: The energy audit program will be promoted at farmers' markets through the Chamber of Commerce. Urbandale will encourage citizen participation and evaluate the feasibility of energy audit recommendations. This will be done by surveying property owners via Urbandale's city website.

Equity & Justice: Urbandale will assist residents and small business owners with technical guidance. Resources and outreach to socially vulnerable areas will be provided to remove actual and perceived barriers to weatherization and appliance replacement. It is important to make sustainability actions individualized for socially vulnerable areas to ensure feasibility for all.

Monitoring Success of Action C2:
Quantitative Metrics: Track energy usage changes via MidAmerican metering processes and calculate the difference before and after implementing energy audit recommendations. The data will be weather-normalized for accurate measurements.

Qualitative Metrics: Solicit feedback from property owners via focus groups on the effectiveness of the program and the reasonableness of recommendations.

Action C3: Perform a code cleanup to reduce barriers for residents to implement renewable energy (mid-term, mitigation).

A "code cleanup" action involves writing explicit definitions for the various renewable energy technologies that will be implemented in Urbandale. Explicit definitions ensure that residents and government officials have a collective understanding of what constitutes a *renewable energy device* and clearly articulate the process of installing said renewable energy devices on buildings. The City of Urbandale can also deny homeowner associations (HOAs) from regulating the aesthetics of openly displayed renewable energy devices.

Potential Partners: Iowa Utilities Commission and U.S. Environmental Protection Agency (EPA).

Funding: Bipartisan Infrastructure Law (BIL): Resilient and Efficient Codes Implementation, Environmental Protection Agency: Environmental Justice (EPAEJ), Tax Increment Financing (TIF) Districts, Municipal Bonds.

Community Engagement: Engage the public at City Council meetings and through additional focus groups conducted at resilience hubs to gauge public perception and effectiveness of code modifications.

Equity & Justice: The city will prioritize educating residents on the newly revised code with a newsletter that is made available in various languages for Urbandale's diverse residents. Urbandale will build relationships and effective communication with socially vulnerable residents. Prioritizing relationships leads to effective partnerships that will support and connect communities long-term. This will create a sense of security in sharing necessary information that keeps the community supported.

Monitoring Success of Action C3:
Quantitative Metrics: Review the percentage of city codes "cleaned" before and after the process as a progress report.

Qualitative Metrics: Solicit community input with focus groups to determine which codes to add, keep, or remove. These meetings will be held in person and online.

Action C4: Collaborate with local financial institutions to offer low-interest loans for renewable energy projects and facilitate power purchase agreements between businesses and renewable energy providers (long-term, mitigation).

The City of Urbandale can continue its partnership with the Neighborhood Finance Corporation (NFC) to offer low- to moderate-income households solar opportunities, with the possibility of the loan being forgiven. The NFC also offers low- to moderate-income households loan opportunities to make their homes more efficient, which is recommended before committing to private generation. The City of Urbandale can provide NFC Home Improvement Loans to socially vulnerable areas. Identified areas can receive lower fixed interest rates with a longer payback period.

Potential Partners: Local financial institutions, renewable energy providers, MidAmerican Energy.

Funding:
Environmental Protection Agency: Environmental Justice (EPAEJ), Tax Increment Financing (TIF) Districts, Municipal Bonds.

Community Engagement: Urbandale will build partnerships with local businesses to advertise potential opportunities to residents. A list of local financiers will be created and posted on Urbandale's city website with a survey that allows users to post feedback regarding the financer's assistance.

Equity & Justice: The city will prioritize low-interest loans for socially vulnerable residents. Applicants will be provided with the choice to rank available loans and streamline the process by applying for all loans with one application, accompanied by specific documentation required for each specific loan. Based on qualifications, the application that best meets the criteria will be selected. If one does not receive a loan, they will be put on the top of the list for the next round of selection, provided they meet the basic requirements.

Monitoring Success of Action C4:
Quantitative Metrics: Record the number of low-interest loans given to residents.

Qualitative Metrics: Send out community feedback forms to gauge the applicant's prospective ease of use.

Action C5: Financially support low-income communities and identify local businesses or organizations that support the mission as resilience hubs (long-term, mitigation).

Resilience hubs are community-serving facilities established to support residents,

coordinate communication, distribute resources, and reduce carbon pollution. Resilience hubs can reduce carbon pollution by educating their visitors on GHG emissions with specific measures to offset personal carbon footprints. The sites of the resilience hubs should be well-trusted with wide community support. For example, the hub can be a bicycle shop that advocates emission-free travel, like cycling. They seek to enhance the quality of life for all and often target socially vulnerable areas.

Potential Partners: Local financial institutions, local non-governmental organizations (NGOs), NFC.

Funding: Local Government Energy Program: Communities Sparking Investment in Transformative Energy (C-SITE), Environmental Protection Agency: Environmental Justice (EPAEJ), Tax Increment Financing (TIF) Districts, Municipal Bonds.

Community Engagement: The City of Urbandale can hold open workshops in highly traveled and socially vulnerable areas to develop a list of potential resilience hub locations. It is beneficial to partner with local NGOs to identify and assist low-income communities. The locations can be narrowed with focus groups to determine which organizations align with the resilience hub mission.

Equity & Justice: Identify resilience hubs in socially vulnerable areas to improve quality of life while offering aid in disasters and lowering carbon emissions. Resilience hubs intend to connect and uplift residents by providing resources and education. Places of religious worship are often coordinated as resilience hubs. To ensure comfort for all, and maintain respect for differing perspectives, at least one non-religious resilience hub should be identified for every religious one.

Monitoring Success of Action C5:
Quantitative Metrics: Develop energy burden statistics from self-reporting percentages compared to a map of socially vulnerable areas.

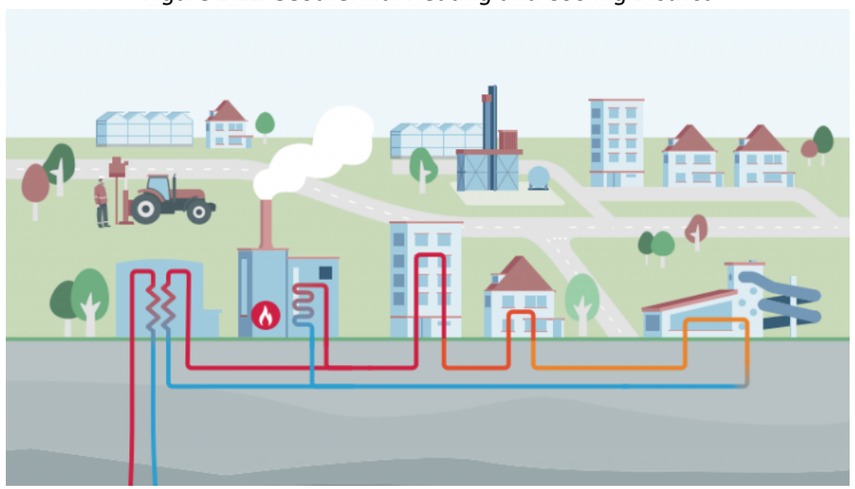
Qualitative Metrics: Hold open workshops to receive feedback from socially vulnerable community members on their interactions with resilience hubs.

Action C6: Implement a geothermal heating and cooling district (long-term, mitigation).

Geothermal districts use wells, piping, and pumps to pull the Earth's heat out of the ground to keep buildings warm in winter and cool in summer. When established at a larger scale, geothermal districts are less expensive and financially beneficial to homeowners.

Figure 2.12 visualizes the mechanics of a geothermal heating and cooling district. The underground tubing circulates hot water, indicated in red, and cold water, displayed in blue. In winter, hot water is pumped through the pipes to heat buildings within the district system, and the cooled water is then returned to be reheated and recycled. In summer, the system reverses.

Figure 2.12 Geothermal Heating and Cooling District



Source: ThinkGeoEnergy, 2020.

Potential Partners: Department of Energy.

Funding: Local Government Energy Program: Communities Sparking Investment in Transformative Energy (C-SITE), Environmental Protection Agency: Environmental Justice (EPAEJ), Tax Increment Financing (TIF) Districts, Municipal Bonds.

Case Study: The City of Framingham has selected three sites to be considered for a geothermal station. Using geothermal energy transfer, the city is partnering with MetroWest to install geothermal equipment. It is stated that the pilot project will determine the future scale of geothermal energy usage. The city provided a map that shows the location of the facility and those benefiting from the project, along with a schedule of events and the entire implementation process. Figure 2.13 shows the construction process of the underground tubing for the geothermal system.
Source: Eversource Geothermal Pilot Program, n.d.

Figure 2.13 Geothermal Construction

Community Engagement: Geothermal districts will be promoted at farmers' markets and other public events to increase awareness and demand. The outreach will include informational flyers and posters to present possible geothermal options in Urbandale.

Equity & Justice: The city will study the feasibility of implementing geothermal districts and/or heat pumps in socially vulnerable areas to save on heating and cooling to minimize energy burden. A pilot community with heat pumps would display feasibility for socially vulnerable areas. Urbandale will collaborate with residents to oversee the project and present progress reports.

Monitoring Success of Action C6:
Quantitative Metrics: Track the efficiency in geothermal and non-geothermal districts to compare changes in energy bills and energy burden statistics.

Qualitative Metrics: Conduct focus groups for homeowners in geothermal districts to gauge efficacy and ease of use.

Action C7: Replace all city-owned lights with LEDs for greater energy efficiency (long-term, mitigation).

This action focuses on street lighting as it helps public well-being and creates a sense of safety. Therefore, streetlights are a necessary part of the urban landscape and should be consistently functional at dark hours. Converting incandescent streetlights into LEDs improves the overall efficiency of streetlights, resulting in less energy usage. By switching to energy-efficient bulbs, the money allocated for streetlight maintenance and upkeep can be redirected to other actions.

Potential Partners: MidAmerican Energy.

Funding: Local Government Energy Program: Communities Sparking Investment in Transformative Energy (C-SITE), Environmental Protection Agency: Environmental Justice (EPAEJ), Tax Increment Financing (TIF) Districts, Municipal Bonds.

Case Study: In 2019, the City of Cleveland launched an effort to upgrade over 61,000 streetlights to LED technology under the city's SafeSmart CLE banner. This program was designed to reduce energy usage, improve lighting conditions across the city, and serve as a platform to build additional smart city solutions. As of February 12, 2021, approximately 90 percent of streetlights have been upgraded and the city is beginning an assessment of energy savings related to the project. The new lights provide higher visibility, increased safety, reduced maintenance costs due to longer-lasting bulbs, reduced energy consumption, and an automatic signal of lightbulb failure for timely repairs. Figure 2.14 exemplifies Cleveland streetlighting before and after this program. The image above shows the street before this program and the one below displays the newly installed LEDs. *Source: Center for Public Partnerships & Research, n.d.*

Figure 2.14 Streetlight Comparison

Community Engagement: The city should replace city-owned streetlights to promote the change to more efficient lighting for residents. Urbandale can provide a city-wide survey to report faulty or poorly maintained city lights to ensure that improvements are made as the topmost priority to residents.

Equity & Justice: LED lights are brighter, more energy-efficient, and cost-effective. This transition promotes safety and cost savings long term. Based on the Social Vulnerability Index, socially vulnerable areas will be identified for targeted intervention in LED replacement.

Monitoring Success of Action C7:
Quantitative Metrics: Compare pre- and post-implementation energy bills to gauge energy savings.

Qualitative Metrics: Host interviews to receive feedback from residents living on newly brighter streets.

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Chapter 3: Net-Zero Energy Buildings

INTRODUCTION

Energy-efficient practices are actions and technologies implemented to reduce the energy required for a building to function properly. These practices aim to optimize energy use by minimizing energy waste and consumption through weatherization and retrofitting. Net-zero buildings produce as much renewable energy as they consume, achieving an equal balance between production and usage each year. Currently, the combined energy exhaustion from Urbandale's commercial, industrial, and residential sectors accounts for 64.24% of the city's CO2 emissions (DSMAPO, n.d.). The City of Urbandale will pursuit a transition to clean energy sources and efficient energy consumption towards the betterment of the community and environment.

By utilizing energy-efficient resources and reducing dependence on fossil fuel and artificial heating, cooling, and lighting, Urbandale strives to support sustainable commercial, residential, and industrial buildings. Energy consumption can be reduced by weatherization improvements that ensure the interior is protected from the elements. By reducing the energy use of all properties, Urbandale can decrease its GHG emissions and empower residents to live in safe, comfortable, and environmentally friendly homes, strengthening the community's resiliency against changing environments.

Additionally, Urbandale aims to reduce energy consumption and promote communal resiliency and prosperity through retrofitting strategies. Retrofitting involves upgrading and modifying structures to enhance efficiency while promising substantial cost savings.

To Better Understand this Chapter:

This section is intended to ease the understanding of the *Net-Zero Energy Buildings* chapter. Below is a brief glossary with critical terms and their definitions.

- *Energy audit:* An inspection survey and an energy flow analysis for energy conservation in a building.
- *Geothermal heating and cooling:* Geothermal systems, for heating and cooling, source heat from the ground to regulate a building's temperature.
- *International Energy Conservation Code (IECC):* The IECC is a code that sets minimum standards and requirements for new building construction. This increases a structure's energy efficiency through improvements to the walls, floors, lights, windows, doors, and more (Insulation Institute, 2020).
- *International Living Future Institute's Zero Carbon Certification:* This certification verifies that a built project's operational and embodied carbon emissions have been neutralized (Living Future, n.d.).
- *Net-zero building:* A net-zero building is an energy-efficient structure where, on a source-energy basis, the actual annual delivered energy is less than or equal to the on-site renewable exported energy. Each year, a net-zero home would produce enough energy from renewable sources to generate the necessary amount of power for the entire structure.
- *Retrofitting:* Retrofitting is the installation of new, energy-efficient appliances, technology, or features to older systems that transition them closer to a net-zero building.
- *R-value:* An R-value measures your home's insulation—rating a building's insulating material's resistance to conductive heat flow. It is measured in terms of its thermal resistance. This is most easily gauged from the attic. The higher the R-value, the better the home's insulation is performing.
- *Tax credit:* A tax credit is a financial incentive provided by the government that allows residents to reduce the amount of tax they owe.
- *Weatherization:* Weatherization is the act of protecting a building against adverse weather impacts, especially cold, wind, or rain. Sufficient weatherization will minimize air leakage—stopping heat from escaping or drafts from entering the building.

ENERGY EFFICIENCY GOAL D

Goal D: Ensure that new commercial, industrial, and residential buildings maximize energy efficiency through weatherization.

The Big Picture: The promotion of sustainability is closely linked to the interior and exterior of buildings. Efficient building design reduces the need for artificial heating, cooling, and lighting systems, all of which require significant amounts of energy and produce large quantities of GHG emissions. Efficient energy design minimizes a building's energy demand. This approach emphasizes airtight construction, sufficient insulation, and balanced ventilation. Urbandale has numerous structures built before quality construction standards were established, leaving plenty of poorly insulated homes. As time passes, buildings age and new materials and codes are updated and approved. Ensuring that the blend of commercial, industrial, and residential buildings is properly upgraded and weatherized is crucial to withstand adverse climate effects. Through weatherization, Urbandale can support a sustainable community with energy-efficient and resilient buildings throughout the city.

UN Sustainable Development Goal(s):

Sustainable Development Code(s): Net-zero energy buildings

Co-Benefits: Energy efficiency, community development, livability refinement, partnership formation

City Assets: Urbandale can implement some of the actions below on city-owned buildings to set a model for efficient and sustainable building design. First, the city can enact an energy efficiency standard for new construction on city-owned land. This demonstrates sufficient weatherization and insulation installments and promotes an example of energy efficiency and sustainable development. The city can provide a model for residents to follow by emphasizing the feasibility of weatherization upgrades**.**

Second, Urbandale's city-owned buildings can further exemplify inclusivity in sufficient weatherization. Urbandale has many city-owned buildings that would have a large impact on reducing GHG emissions. Using city-owned buildings to promote sustainability includes moisture control, air sealing, ventilation, and upgrades to insulation, doors, and windows. By making these changes, Urbandale can improve the efficiency and sustainability of its infrastructure and provide a cost-effective model for residents.

Connection to Existing Plans: The *Urbandale Strategic Plan* focuses on community development through environmentally sustainable practices. A long-term objective of the strategic plan is to develop "green" city infrastructure. By utilizing weatherization strategies, the city can reach this sustainability objective and be recognized for its resilient, "green" city infrastructure.

Learning from Data

Several themes were identified by local refugees and immigrants in the focus group, indicating unaddressed needs from the city. Regarding weatherization, there were themes of poor housing quality. Some participants expressed the frustration of wanting to buy a new home in areas of Urbandale that are aging. This emphasizes the need for housing quality improvements throughout the city.

The area is becoming old. There is a lot of people who want to sell their house and buy new.

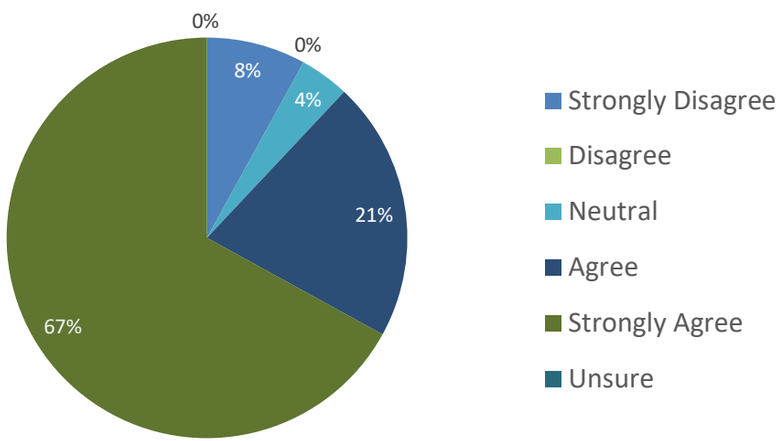
Some participants of the focus groups preferred to speak in their native language and were offered a translator. These groups noted themes of language barriers in Urbandale, which presented as a major obstacle to community involvement. One participant in the focus group emphasized the hardship of first buying a home in Urbandale due to the language barrier. For these individuals, the house-buying process is a lot longer and slower. In some cases, they would lose the house they wanted because of it. This focus group noted the importance of providing access to information in various languages to increase their awareness of programs that the city offers.
Because of the language barrier, we aren't really involved with the community and what they do.

Since there is a language barrier, it takes more time to buy the house. We have to wait for someone who speaks Burmese to help speak with the realtor.

While they are waiting [for an interpreter], other people will get that house, so they have to wait for another house.

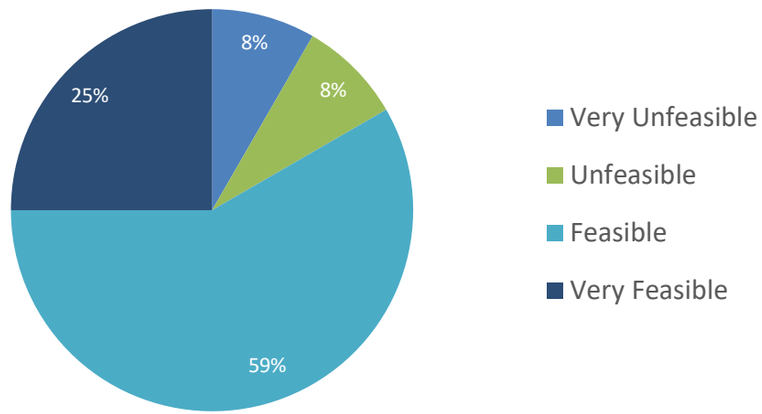
At the library event, participants were asked where they stood on the construction of net-zero energy buildings. As seen in Figure 3.1, this question revealed that 67% of respondents strongly agree that net-zero energy-building strategies should be implemented in the city. This feedback demonstrates support for net-zero energy buildings, making weatherization a crucial tool to reach this point.

Figure 3.1 Constructing Net-Zero Buildings



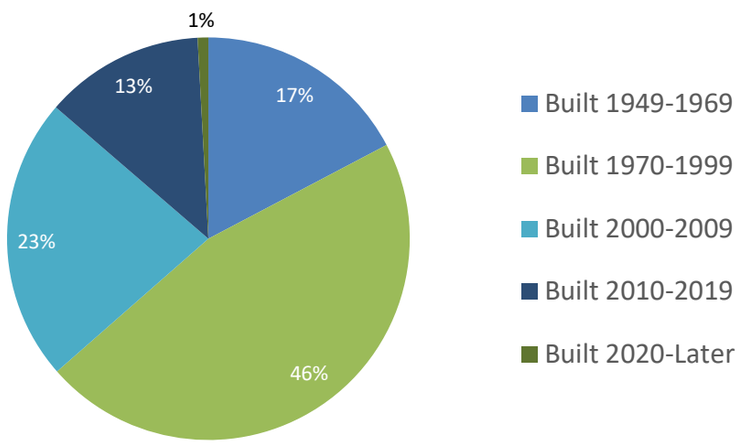
Survey participants were also asked for their opinion on the feasibility of constructing net-zero energy buildings in Urbandale. Figure 3.2 reveals that 59% of respondents find it feasible, and 25% find it very feasible. There is a low portion of respondents who do not find net-zero energy buildings viable for Urbandale. This data highlights the city's overall support for net-zero energy strategies and emphasizes a need for education and low-cost weatherization upgrade assistance for those who find it attainable for the city.

Figure 3.2 Feasibility of Net-Zero Energy Buildings



Iowa adopted the 2012 International Energy Conservation Code (IECC) with local amendments in 2014. Homes built after 2012 are sufficiently insulated, but those built before may need upgrades. Figure 3.3 expresses the percentage of housing units constructed in Urbandale by year, emphasizing the number of older homes in the city. Only 14% of all houses in Urbandale were built after 2010. This is a low percentage of the city's overall housing supply, demonstrating the need to expand appropriate insulation to older homes to save on energy consumption.

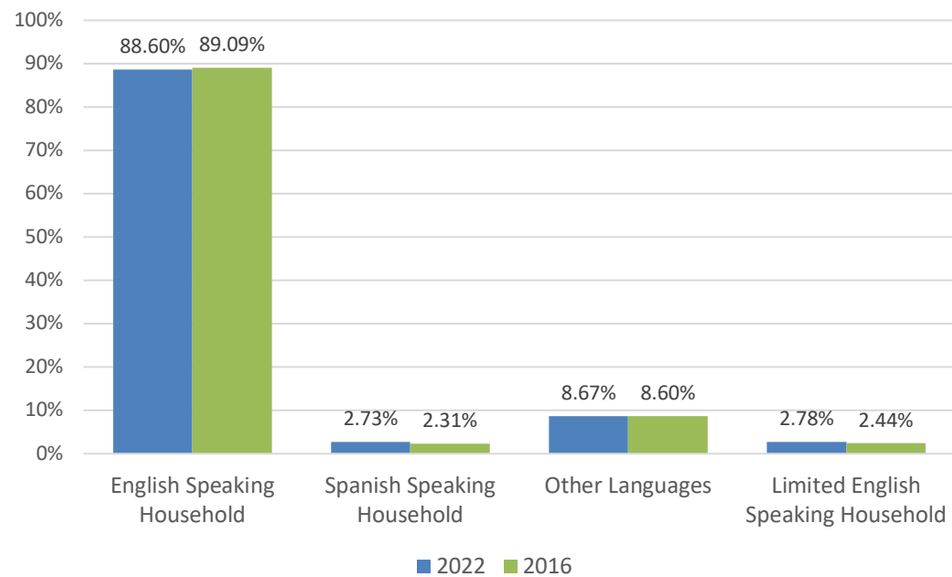
Figure 3.3 Amount of Housing Structures by Year Built



Source: 5-Year Estimate 2022 ACS, U.S. Census Bureau

As seen in Figure 3.4, around 10% of Urbandale's population speaks a language other than English in their home. Between 2016 and 2022, there has been an overall increase in residents who speak a language that is not English. Roughly 3% of residents live in a household with limited English-speaking proficiency. This indicates a need to target this specific population by creating language-based services, such as sharing documents translated into different languages.

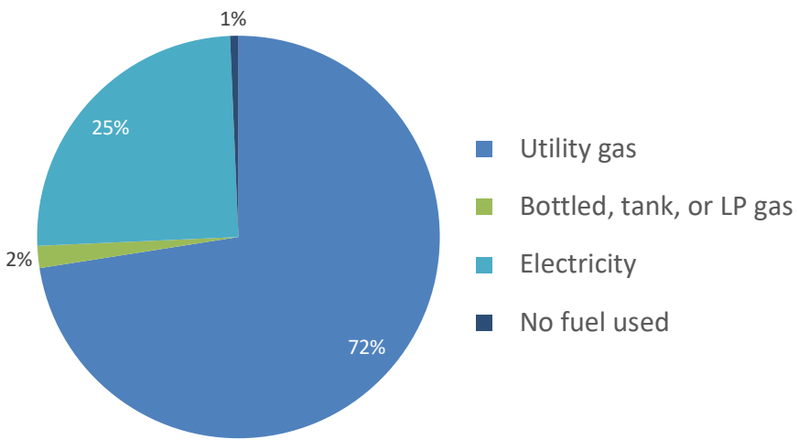
Figure 3.4 Language Spoken in Urbandale in 2016 and 2022



Source: 5-Year Estimate 2022 and 2016 ACS, U.S. Census Bureau

Figure 3.5 displays the various forms of heating fuels used throughout Urbandale and the percentage of houses that use each type. Primarily, Urbandale residents use utility gas at 72%. 25% of residents use electricity, and very few use other sources to heat their homes. This suggests that houses in Urbandale can benefit from weatherization to decrease energy consumption and support sustainability by lowering the city's reliance on gas.

Figure 3.5 Urbandale Housing Heat Fuel Sources in 2022



Source: 5-Year Estimate 2022 ACS, U.S. Census Bureau

ACTIONS FOR GOAL D

Action D1: Implement an efficiency standard for all new construction covering insulation, lighting, appliances, and power generation offset. (long-term, mitigation).

This action can be implemented by requiring all new buildings to be designed and constructed to meet a minimum energy efficiency rate, including commercial, industrial, and residential buildings. A minimum energy efficiency rate for building construction defines a set of standards and requirements. This ensures buildings are designed to achieve a certain level of energy efficiency. This action aims to establish a comprehensive set of guidelines that promote energy efficiency in new construction projects.

Action D1 intends to ensure that all new buildings are energy-efficient in all aspects to reduce their environmental impact and contribute to sustainability goals. New construction standards can require ENERGY STAR®-rated appliances, including refrigerators, dishwashers, and heating, ventilation, and air conditioning (HVAC) systems. Power generation can become more efficient by requiring on-site renewable energy generation. Energy-efficient insulation is the installation of high-performance materials to provide the building with resistance to heat flow, improving costs and comfort.

Insulation construction is commonly measured with R-values. By monitoring R-values, homes will have minimized air leakage, increased savings on heating and cooling bills, and reduced consumption overall. The state of Iowa adopted the 2012 IECC Code in 2014. IECC requires different R-values for different climate zones. Urbandale is in climate zone 5, meaning its buildings should be sufficiently weatherized to align with the state's respective R-values, as displayed in Table 3.1 (Insulation Institute, 2020).

Table 3.1 2012 IECC R-value Code Requirements

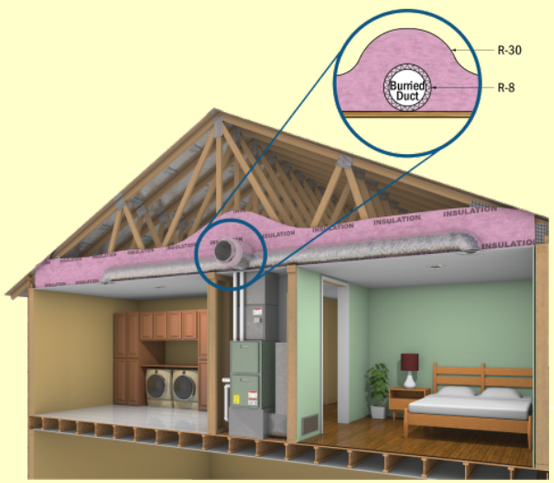
2012 IECC Code Section	R-Values for Climate Zone 5
R402.1.1 — Wood Frame Wall	R-20 or R-13+5 ci
R402.1.1 — Ceilings	R-49
R402.1.1 — Basement Walls	R-19 or R-15 ci
R402.1.1 — Crawl Space Walls	R-19 or R-15 ci
R402.1.1 — Fenestration	U-0.32

Source: Insulation Institute, 2020.

Potential Partners: Home Builders Association of Greater Des Moines, Associated Builders and Contractors of Iowa, MidAmerican Energy Efficiency Programs.

Funding: Home Electrification and Appliance Rebates (HEAR) Program and Midwest Building Decarbonization Coalition (MBDC).

Case Study: The state of California established Title 24 Building Energy Efficiency Standards. Title 24, Part 6 regulates building energy efficiency in newly constructed projects, also including additions and alterations of residential and non-residential buildings. It is updated every three years, focused on efficiency goals and advancing with new technologies. These standards regulate a building's walls, roofs, windows, doors, foundations, space-condition systems, water-heating systems, pools and spas, solar-ready buildings, all lighting, and electrical power distribution systems. Title 24 is enforced through California's Building Standards Commission. Local building departments oversee compliance with these standards during construction and renovation.



Source: California Energy Commission, n.d.

Figure 3.6 Title 24 Insulation Standard

Community Engagement: Urbandale will issue a detailed guide of enhanced efficiency standards for builders obtaining permits for new construction in the city. The city will provide open houses biannually to discuss the new efficiency standard. During these meetings, focus groups will be held with builders and developers to understand their experiences with following the efficiency standard.

Equity & Justice: The city will implement a standard for new construction to provide incoming residents with an energy-efficient home. This standard will carry across all housing types and subsidies will be provided for developers to incorporate energy-efficient features in low-income housing projects.

Monitoring of Success of Action D1:
Quantitative Metrics: 1) Track the number of new construction projects following efficiency rates. 2) Monitor the monthly change in the percentage of energy use.

Qualitative Metrics: Feedback from builders and developers about the difficulty of implementing the efficiency standard through focus groups conducted at the biannually open house.

Action D2: Encourage all homeowners to prioritize attic insulation with energy audits (mid-term, adaptation/mitigation).

Homeowners will be encouraged to undergo energy audits. Audits evaluate a home's energy performance by identifying areas for improvement and recommending energy-saving measures. During energy audits, attic space will be prioritized as they experience large amounts of heat fluctuation due to poor insulation.

Potential Partners: Home Builders Association of Greater Des Moines and Associated Builders and Contractors of Iowa.

Funding: Weatherization Assistance Program (WAP) and Low-Income Home Energy Assistance Program (LIHEAP).

Case Study: The City of Iowa City's Insulate Iowa City program offers a grant for income-qualified homeowners to increase the amount of insulation in their homes. Insulate Iowa City seeks to save residents on energy costs, increase comfortability in the summer and winter months, and decrease individual carbon footprints for a collective change. All of the program's costs are covered by the city, funded through property taxes; they have also created a mascot to promote their goal, as seen in Figure 3.7. Since the program started, the city has given out nearly 100 insulation grants. Through this program, homeowners see an immediate reduction in the amount they pay in energy bills due to sufficient insulation. *Source: Insulate Iowa City, n.d.*

Figure 3.7 Insulate Iowa City Campaign

Community Engagement: A brochure will be provided after the energy audit to provide resources for weatherizing a home. After an energy audit is conducted, surveys will be sent to the participants for feedback.

Equity & Justice: The city will use property tax funding to pay for and conduct the audits. This will ensure equal opportunity for homeowners to understand their building's insulation quality.

Monitoring Success of Action D2:
Quantitative Metrics: Monitor the energy consumption of homes before and after insulation upgrades to attics.

Qualitative Metrics: Conduct surveys with residents who participate in energy audits.

Action D3: Create inclusive weatherization assistance by incorporating language interpretation services and incentives for all (mid-term, adaptation).

By creating an inclusive weatherization assistance program for individuals with limited English proficiency to have meaningful access to benefits, services, and information regarding weatherization. This action needs to be designed in partnership with the state of Iowa to ensure inclusivity and minimize the disproportionate effects that spur from limited English proficiency in an English-dominated area. All information on Urbandale's city website will be translatable to guarantee access to all resources and services for energy efficiency improvements.

The Iowa Weatherization Assistance Program provides benefits to Iowa residents to solve certain health and safety problems, maintain affordable low-income housing, reduce utility averages, and reduce environmental pollution. Iowa's Low-Income Home Energy Assistance Program is designed to assist low-income families in Iowa, with a specific annual gross income poverty guideline.

Potential Partners: Iowa Environmental Council.

Funding: Weatherization Assistance Program (WAP) and Low-Income Home Energy Assistance Program (LIHEAP).

Case Study: Ingersoll Ave mixed-use project is currently being built in West Des Moines, Iowa. This project is Iowa's first zero-carbon certified building, shown in Figure 3.8. It is in Ingersoll's dense and mixed-use corridor. It will provide affordable housing units along with retail and office space offered on the first floor. The developers of this project focused on utilizing a design/build project delivery method, selecting a team that has the capacity to execute the project but with low enough overhead to stay within budget, and utilizing any available subsidies. All of those things helped bring the costs down to make this project a reality. Though affordable housing projects are very budget sensitive, and sustainability initiatives can be costly, there are ways to make it possible, as this Ingersoll development has shown. *Source: Backers' Goal…, n.d.*

Figure 3.8 Ingersoll Zero Carbon Building

Community Engagement: Urbandale will offer training programs to residents interested in weatherization. Focus groups will be held with socially vulnerable residents to hear feedback every six months.

Equity & Justice: An inclusive weatherization program will surpass language barriers to connect socially vulnerable areas with highly beneficial services. This action will extend throughout Urbandale to its public website and all public boards to ensure that weatherization information is attainable for all. The program offers every resident the opportunity to lower their yearly utility expenses and increase property values through weatherization.

Monitoring Success of Action D3:
Quantitative Metrics: 1) Monitor the quarterly change in the percentage of energy use in socially vulnerable areas. 2) Measure the percentage of participants who complete the program successfully to indicate the effectiveness of the language-based services.

Qualitative Metrics: Feedback from socially vulnerable residents through focus groups conducted every six months.

Action D4: Encourage buildings to attain an International Living Future Institute's Zero Carbon Certification (short-term, adaptation).

The Living Future Institute is a nonprofit organization that aims to build an ecologically minded world for all. The Zero Carbon Certification was developed in 2018 to directly address the building industry's role in producing GHG emissions. For a fee, buildings will be assessed on their implementation of green practices, GHG reduction, and energy consumption. This certification will help Urbandale's buildings become more sustainable and function at a higher standard.

Different tiers of certification are available based on a building's reduction levels and are compared to the emissions average of a similar-sized structure. The highest level is 'Operation Carbon,' which requires that 100% of the operational energy use of the building must be offset by renewable energy. The second level is 'Embodied Carbon,' where all projects must set a goal to achieve below the approved embodied carbon threshold for the upfront embodied carbon of the project. The third level is 'Energy Efficiency,' where energy efficiency targets must be met over a 12-month performance period. The fourth level is 'Material Embodied Carbon Emission,' where the material's embodied carbon emissions must be less than an equivalent baseline. Certification can help showcase the community's dedication to environmentally-focused improvements (Living Future, n.d.).

Potential Partners: U.S. Green Building Council, Associated Builders and Contractors of Iowa, Iowa Environmental Council.

Funding: Green and Resilient Retrofit Program (GRRP).

Community Engagement: Urbandale will provide brochures to share indicators of success in the certification process. These brochures will be designed to inform and engage residents about the advantages of International Living Future Institute's Zero Carbon Certification. Through this program, surveys will be held annually to gain feedback from property owners after attaining the certification.

Equity & Justice: To encourage commercial buildings to attain Living Future Institute's Zero Carbon Certification, Urbandale will offer tax breaks for commercial developers who pursue it and for those who incorporate equitable energy efficiency. The city will provide technical assistance and support to smaller businesses throughout the process of attaining a Zero Carbon Certification.

Monitoring Success of Action D4:
Quantitative Metrics: 1) Monitor the annual change in the percentage of energy savings. 2) Track the number of buildings at each level of certification.

Qualitative Metrics: Feedback from property owners through annual focus groups during and after attaining certification.

RETROFITTING GOAL E

Goal E: Retrofit existing buildings to reduce energy consumption.

UN Sustainable Development Goal(s):

Sustainable Development Code(s): Net-zero energy buildings

The Big Picture: The City of Urbandale has many homes that are more than 50 years old, which have not been updated to current Iowa building code standards for energy efficiency. That would be the building codes set by the State, from 2016 standards. Retrofitting existing buildings within the community, on both a large and small scale, is important for supporting sustainability. By upgrading older appliances, fixtures, and devices with energy-efficient models, energy consumption and GHG emissions costs will be reduced. This enhances the well-being of building owners as comfort is maximized through efficient and resilient properties. By prioritizing the quality of Urbandale's structures, the city is working toward leading in sustainable net-zero energy buildings.

Co-Benefits: Energy efficiency, community development, livability refinement, partnership formation

City Assets: Urbandale can retrofit current city-owned building features to support efficiency and sustainability. First, Urbandale can install LED lights in city-owned buildings to exemplify successful lighting efficiency. This can involve replacing older, incandescent light bulbs with newer, energy-saving bulbs, like LEDs, in all city-owned buildings. By making these changes, Urbandale can reduce its energy consumption and inspire energy efficiency strategies for residents.

Second, Urbandale can demonstrate readily achievable and cost-effective changes by implementing low-cost retrofitting strategies in city-owned buildings. This could involve improving insulation, securing doors/windows, and utilizing natural light in all city-owned buildings. Urbandale can host tours of their buildings to make residents aware of low-cost retrofitting strategies. By doing this, the city can improve its overall energy efficiency and emphasize feasibility for residents. Urbandale can continue to implement retrofitting improvements in city-owned buildings over time to consistently showcase updated and relevant models.

Connection to Existing Plans: The goal of retrofitting existing buildings seeks to align with Urbandale's *Strategic Plan* and its intention to create inclusive and environmentally sustainable communities. By developing an energy equity program and city-led exchange

programs that offer energy efficiency strategies with low-cost assistance for all, Urbandale is making a critical step toward achieving the city's goal of an inclusive and environmentally sustainable future.

Learning from Data

Some participants of the focus groups expressed that they faced challenges with high housing costs in Urbandale.

Our incomes... the housing is too expensive, so it is not affordable to us when we first moved in.

The survey at the Chamber of Commerce event included a question focusing on whether net-zero energy buildings are a feasible option for the city. The question revealed that 77% of respondents find it feasible and 23% believe it is not, as displayed in Figure 3.9. This indicates strong support for net-zero energy buildings in Urbandale. The city should continue implementing geothermal/biomass energy-efficient strategies in commercial, industrial, and residential buildings.

Figure 3.9 Feasibility of Net-Zero Energy Buildings

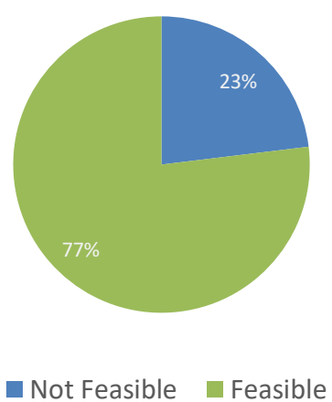
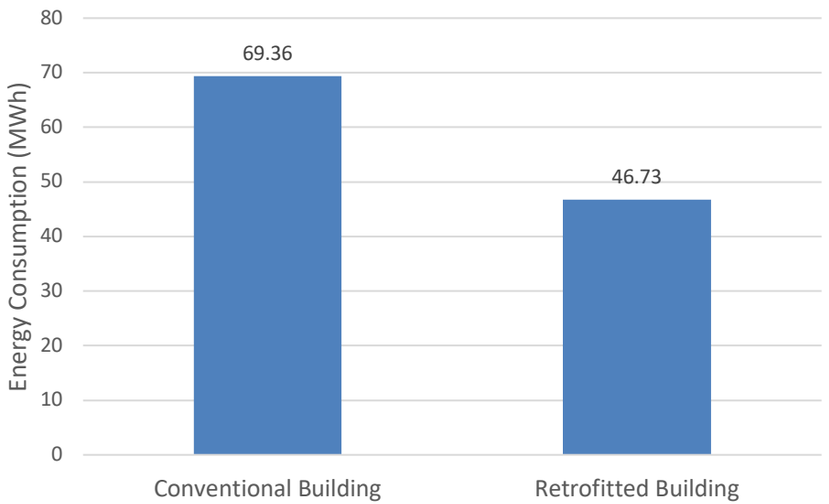


Figure 3.10 compares the energy consumption of a building before and after it was retrofitted. By utilizing a variety of retrofitting strategies, the building was able to have a significant energy reduction of 22.63 MWh. Retrofitting is an incremental practice to reducing GHG emissions, making it a viable option for property owners who want to move gradually toward net-zero energy buildings.

Figure 3.10 Energy Consumption Before and After Retrofitting



Source: Razzaq et al., 2023.

Many factors make light bulbs efficient or not. Table 3.2 compares two non-ENERGY STAR-certified lightbulbs—incandescent and fluorescent. Compared to traditional incandescent lightbulbs, ENERGY STAR-certified bulbs use 70-90% less energy and produce about 70% less heat. These bulbs last about 10-25 times longer and can save up to $80. By transitioning to LED lighting in homes and city-owned buildings, Urbandale is supporting efficient and sustainable technology to reduce GHG emissions.

Table 3.2 Comparison of Non-ENERGY STAR Certified Lightbulbs

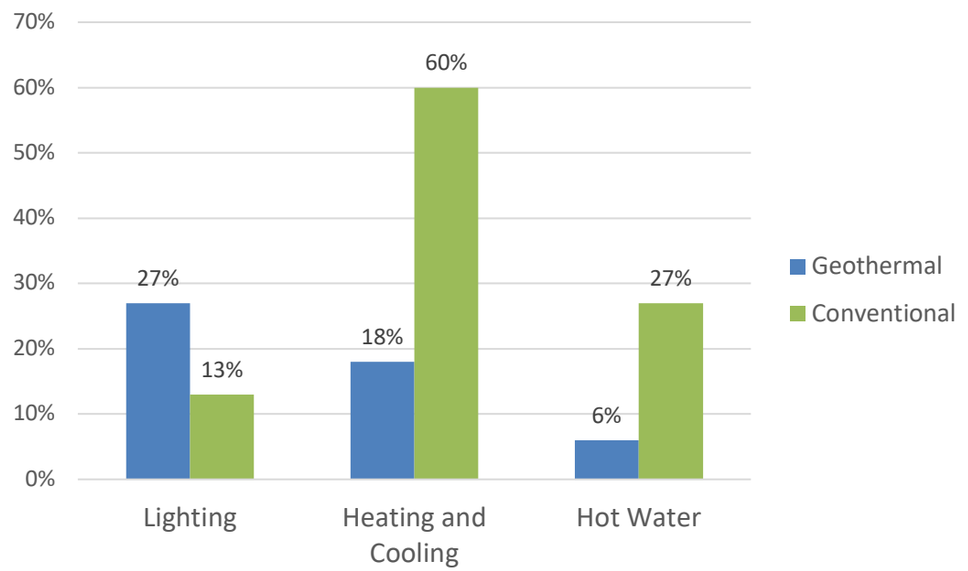
Type of Bulb	Fluorescent	Incandescent
Power Used	13 Watts	60 Watts
Light Output	800 Lumens	800 Lumens
Lifetime	750-1,000 Hrs	6,000-15,000 Hrs
Lifecycle Cost*	$40	$10

** Based on a 6,000-hour CFL, a 1,000-hour incandescent, use of 3 hrs/day, 11.09 cents/kWh electric rate, $3.00 CFL, and $0.50 incandescent.*

Source: ENERGY STAR, n.d.

The presence of geothermal energy significantly reduces the amount of energy needed for heating and cooling, lighting, and hot water. As shown in Figure 3.11, geothermal systems can cut overall carbon emissions from a building's energy use by roughly 49%. This reduction is visualized with the total of the geothermal section, shown in blue, as 51%. Conventional HVAC systems require significantly more energy to operate the same functions. Conventional HVAC systems consume 60% of heating and cooling and geothermal systems consume 18%. Using geothermal energy in homes can significantly reduce energy consumption and GHG emissions.

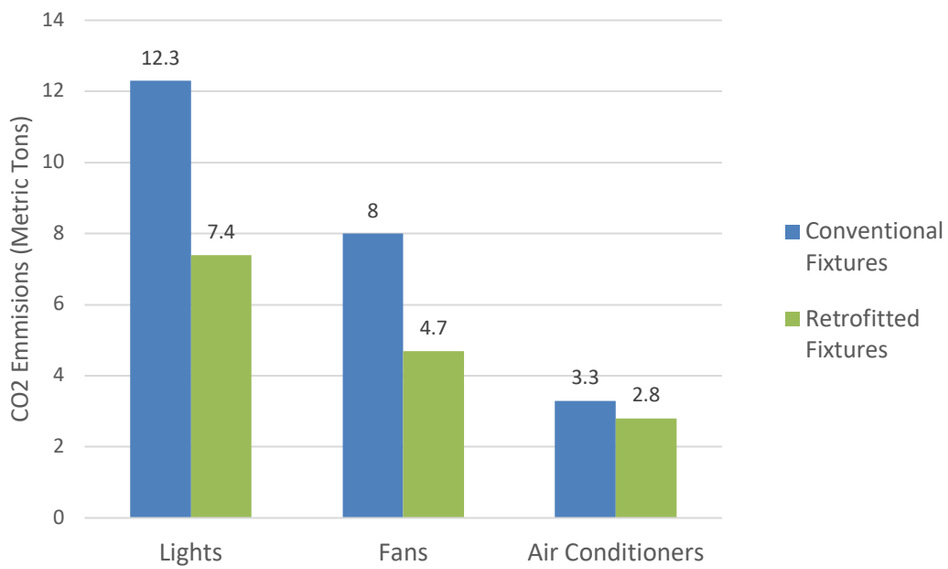
Figure 3.11 Geothermal vs. Conventional HVAC Systems



Source: GeoSolutions, 2023.

Figure 3.12 illustrates the GHG emissions of electrical fixtures such as lights, fans, and air conditioners. After retrofitting lamps with LED lightbulbs, the carbon dioxide emissions produced from lighting were reduced by 4.9 metric tons, and traditional fans to energy-efficient fans decreased by 3.3 metric tons. Prioritizing retrofitting household electrical appliances in Urbandale will lead to more efficient structures and reduce the impacts of carbon dioxide emissions.

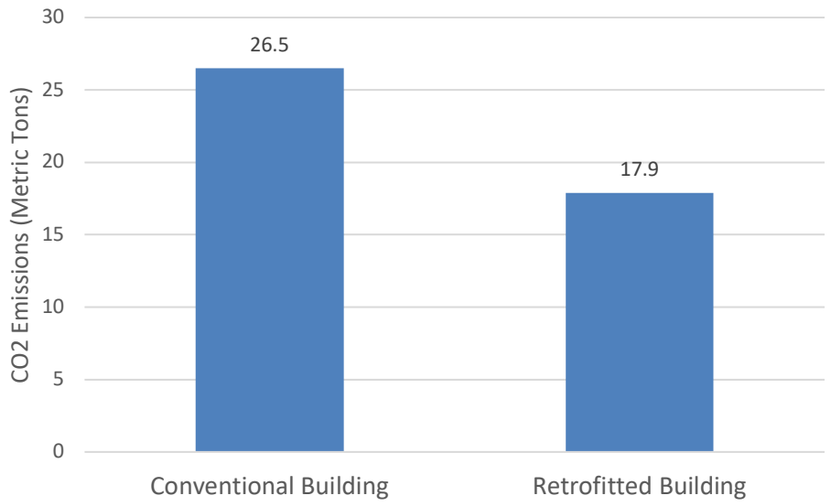
Figure 3.12 Electrical Retrofitting



Source: Razzaq et al., 2023.

By improving heating, ventilation, and air conditioning, a building's GHG emissions will be reduced overall. As seen in Figure 3.13, the improved retrofitted building saw a 33% reduction, 8.6 metric tons, in carbon dioxide emissions. This reduction was achieved by conducting electrical retrofitting, improving the building envelope—walls and windows—and increasing the thickness of its insulation (Razzaq et al., 2023). This illustrates the impact that retrofitting buildings in Urbandale can have to significantly reduce GHG emissions.

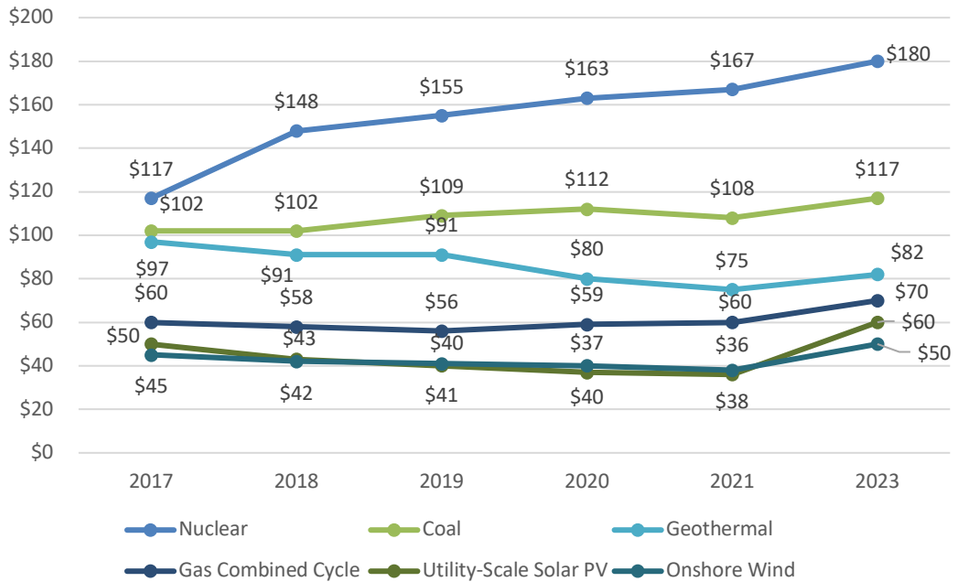
Figure 3.13 Emissions Reduction from Retrofitting



Source: Razzaq et al., 2023.

The levelized cost of energy (LCOE) is the average minimum price ($/megawatt-hour) at which the electricity generated by the asset is required to be sold in order to offset the total costs of production over its lifetime. This analysis in Figure 3.14 tracks various energy sources and shows significant declines in costs for renewable energy generation technologies over time. Geothermal heating is a low-cost source that has remained relatively stable in price. If Urbandale residents use geothermal energy, they can save more money compared to other energy sources.

Figure 3.14 Cost of Energy by Source



Source: Lazard, 2023.

ACTIONS FOR GOAL E

Action E1: Implement a light bulb swap to reduce the usage of older lightbulbs (mid-term, mitigation).

The action of a light bulb swap entails replacing older, broken, and/or less efficient light bulbs with Energy-Star-certified LED light bulbs. By implementing a sustainable LED light swap program, the city can support efficiency at low costs and with low effort from the residents of Urbandale. The city will collect old light bulbs and exchange them for LEDs at no cost to the homeowners. LED light bulbs help residents save on utility expenses while also protecting the environment by reducing GHG emissions.

Potential Partners: Urbandale Community Action Network, Bulb Guy Lighting, Adventure Lighting.

Funding: Energy Advantage Deferred Loan (EADL).

Community Engagement: Educational booths will be set up to inform residents about the light bulb swap program and provide details on where and when swap locations will be held throughout the city. Urbandale will create online forums to receive community feedback on the program's effectiveness.

Equity & Justice: The city will provide access to retrofitting strategies to all residents. Target socially vulnerable communities to reduce travel barriers to participation in the light bulb swap program.

Monitoring Success of Action E1:
Quantitative Metrics: Track the number of LED bulbs sent out to the community and the number of other types received back.

Qualitative Metrics: Develop online forums to receive community feedback on the program's usefulness during and after participation.

Action E2: Develop an Energy Equity program that improves energy efficiency with low-cost assistance for all (long-term, mitigation).

This action allows Urbandale to set an example for inclusive and successful retrofitting strategies, like upgrading HVAC systems and LED lighting. It aims to promote energy efficiency by providing low-cost retrofitting upgrades and assistance to all, specifically targeting low-income residents. It seeks to reduce energy consumption and lower utility bills, thereby making energy more affordable for everyone.

Potential Partners: Iowa Utilities Commission, Urbandale Human Services, NGOs (UCAN and EMBARC).

Funding: Energy Advantage Deferred Loan (EADL), Polk County Large Renovation Gap Funding Program (LRGFP), Low-Income Home Energy Assistance Program (LIHEAP)**,** Federal Income Tax Credits for Efficiency Upgrades (FITCEU), Energy Efficiency and Conservation Block Grant (EECBG).

Case Study: The City of Cincinnati, Ohio, established *WarmUp Cincy*, which provides energy efficiency upgrades to buildings for qualified, low-income property owners. The goal of this program seeks to reduce the amount of energy burden within the community and help those disproportionately impacted by high energy bills. This is done by providing simple air sealing assistance, upgrading LED light bulbs, and more to help save on electrical bills. Since its creation in 2016, *WarmUp Cincy* has provided 200 families with energy efficiency support.
Source: WarmUp Cincinnati, n.d.

Community Engagement: Urbandale will collaborate with churches and community centers in socially vulnerable areas to host assistance events and focus groups to receive valuable feedback.

Equity & Justice: The city will provide diverse communities with a trusted tool by updating the city's website with language-inclusive information for residents to identify and create personalized energy-efficient strategies. This will streamline accessible services and projects for all members of the community, with the primary goal of assisting participants in reaching energy efficiency.

Monitoring Success of Action E2:
Quantitative Metrics: Monitor utility costs and energy savings over time.

Qualitative Metrics: Hold focus groups to receive feedback from socially vulnerable areas.

Action E3: Implement a tax credit for geothermal implementation (mid-term, adaptation).

This action involves the introduction of a tax credit for the implementation of geothermal energy systems. It encourages the adoption of geothermal energy by offsetting the initial installation costs, making it more accessible to all residents.

Potential Partners: Iowa Geothermal Association.

Funding: Federal Income Tax Credits for Efficiency Upgrades (FITCEU).

Case Study: The City of West Union, Iowa, created a community project called *Green Up*, implementing a large-scale geothermal heat pump system that provides heating and cooling for multiple buildings. Currently, 11 buildings are connected with the program, and 58 more are projected to be added into the system. The project cost $10.2 million and oversaw the addition of porous paving renovation, bioswales, sidewalks, streetlights, and a civic plaza in addition to the community geothermal heating system. The map of the district system is shown in Figure 3.15. Each user of the geothermal system pays a fee based on the usage of the system.
Source: Green Up West Union, n.d.

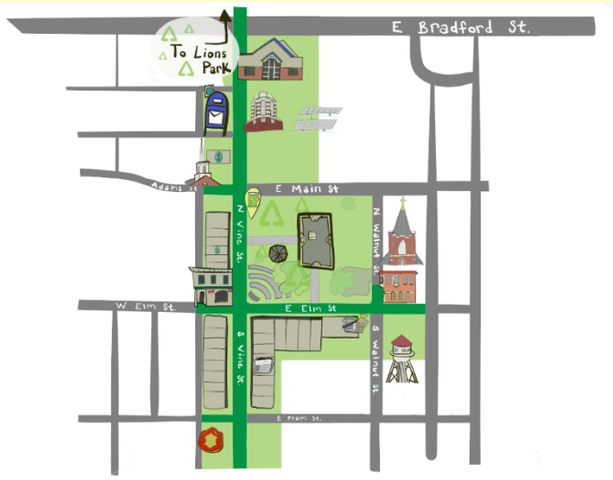


Figure 3.15 West Union Geothermal District

Community Engagement: Educational brochures will be created with accompanying contact/website information. These brochures will be sent to targeted areas. Additionally, surveys will be sent to property owners with geothermal heat pumps to receive feedback.

Equity & Justice: Urbandale will provide access to geothermal heat pumps to residents through the tax credit. Geothermal heat pumps are a major energy-efficient improvement that includes a large up-front cost. Making this project more financially attractive can increase the number of residents able to benefit from the associated savings with geothermal energy.

Monitoring Success of Action E3:
Quantitative Metrics: Measure the number of new geothermal heat pumps in Urbandale and the energy savings of homes with geothermal heat pumps.

Qualitative Metrics: Distribute pre- and post-implementation surveys to property owners with geothermal heat pumps to receive community feedback.

Action E4: Establish a retrofit tax credit program for residential housing (long-term, adaptation).

This program promotes a tax credit for homeowners who retrofit their residential housing to improve the building's energy efficiency. It incentivizes homeowners to invest in energy-saving upgrades, leading to long-term savings and environmental benefits. Before Urbandale proposes a tax credit, the city should leverage all available state and federal support.

Potential Partners: Urbandale Community Action Network.

Funding: Energy Efficiency and Conservation Block Grant (EECBG), Building Resilient Infrastructure and Communities Grant (BRIC), Green Bonds.

Community Engagement: Educational brochures will be created for information on the retrofitting tax credit program. Success stories and surveys will be distributed to participants to collect testimonies.

Equity & Justice: It is important to offer greater financial incentives to low-income and socially vulnerable residents to reduce disparities of the cost barrier to retrofit their homes. A tax credit would provide financial relief to homeowners and allow them to participate in the benefits of retrofitting by offsetting costs and directly reducing the amount of tax a homeowner owes.

Monitoring Success of Action E4:
Quantitative Metrics: 1) Track the number of participants that have applied for the tax credit. 2) Monitor energy consumption and savings of those who have utilized the tax credit for retrofitting.

Qualitative Metrics: Collect testimonials from participants about their experiences with this program through a post-implementation interview.

Action E5: Develop an appliance exchange program (mid-term, adaptation).

This action is designed to encourage the replacement of old, energy-consuming appliances with new, energy-efficient models. It provides a platform for consumers to exchange their old appliances, promoting energy conservation and reducing electricity usage.

Potential Partners: MidAmerican, Urbandale Community Action Network, Urbandale Chamber of Commerce.

Funding: Energy Efficiency and Conservation Block Grant (EECBG), Building Resilient Infrastructure and Communities Grant (BRIC), Green Bonds.

Community Engagement: Educational booths will be set out during community events to provide information on the appliance exchange program. Urbandale will collect feedback from property owners through focus groups.

Equity & Justice: The city will collaborate with socially vulnerable communities to identify areas with high rates of inefficient appliances. Areas with high rates of inefficient appliances will be prioritized in this process.

Monitoring Success of Action E5:
Quantitative Metrics: 1) Measure the energy consumption of participants and the amount of energy savings. 2) Number of appliances replaced in the exchange program.

Qualitative Metrics: Organize focus groups with participants to gain deeper insights into their experiences after participating in the program.

Action E6: Identify business owners and homeowners who have changed their source of energy to renewable sources and create a video with them to share success stories (short-term, adaptation/mitigation).

This action involves identifying and interviewing business owners and homeowners who have successfully transitioned to renewable energy sources. Creating a video that showcases success stories serves as an inspiration and guide for other businesses and residents considering a similar transition.

Potential Partners: Urbandale Community Action Network and Iowa Geothermal Association.

Funding: Building Resilient Infrastructure and Communities Grant (BRIC) and Green Bonds.

Community Engagement: Interviews and educational material will be comprised in a video to empower communities to engage in net-zero energy building.

Equity & Justice: The video will be posted on Urbandale's website to make it publicly available and will provide captions in various languages to increase inclusivity. Valuable resources will be provided to socially vulnerable residents for education on net-zero energy building.

Monitoring Success of Action E6:
Quantitative Metrics: Measure the number of homes that make retrofitting upgrades.

Qualitative Metrics: Conduct interviews with the individuals who have successfully implemented renewable energy solutions to capture their experiences, challenges, and outcomes.

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Chapter 4: Infill Development

INTRODUCTION

Urbandale strives to be a leader in solutions that support efficient urban growth and land development practices. Overall, Urbandale has experienced significant development. Since 2000, the city has seen an 83% increase in urbanized areas, indicating a clear trend of urban sprawl as depicted in Figure 4.37 and Table 4.3 (see pages 101 and 102). Sustainable infill development practices involve reviving underutilized areas within the existing built environment. These practices aim to enhance the social, economic, and natural environments through thoughtful and responsible development. Sustainable development can be achieved by incorporating strategies such as encouraging infill development, promoting nature-based solutions and ecosystem services to enhance biodiversity, expanding urban mobility, and increasing access to food. Urbandale prioritizes conservation efforts and infill development opportunities to mitigate GHG emissions.

Urbandale's pursuit of embodying sustainable development practices promises the betterment of the community and environment. By diversifying land-use development patterns, refining zoning regulations, and prioritizing the use of existing city assets, Urbandale aims to minimize its impact on agricultural land conversion and urban sprawl. Allowing these developments reduces GHG emissions and increases the community's resiliency against changing environments to provide its residents with safe and environmentally friendly communities to live in.

Urbandale prioritizes development standards that promote and enhance conservation efforts. The city should promote increased infill and adaptive reuse that drives walkability, minimizes parking, and supports economic growth. Urbandale looks to increase access to walking and biking infrastructure to reduce GHG emissions. The city prioritizes enhancing access to nutritious, affordable, and culturally desirable food for all that is accessible via any mode of transportation. Capitalizing on opportunities for sustainable development improves quality of life, protects vital natural resources, bolsters resiliency to heat and flooding, and improves air quality.

By expanding urban mobility with pedestrian- and bike-friendly infrastructure, citizens will be more inclined to choose environmentally friendly modes of transportation. The introduction of walkable and bikeable infrastructure allows more residents to opt for sustainable transit and fosters a deeper sense of connection to the community through recreational transit.

The City of Urbandale will further sustainable development by improving access to food through community gardens, farmers' markets, and food programs. These initiatives are important because they provide residents with fresh, nutritious food options, thereby promoting better health and well-being in an environmentally beneficial way to enhance overall community resilience.

To Better Understand this Chapter:

This section is intended to ease the understanding of the *Infill Development* chapter. Below is a brief glossary with critical terms and their definitions.

- *Carbon sequestration:* This process mitigates atmospheric emissions through the capture and storage of GHG emissions. Trees and urban forestry play a significant role in carbon sequestration.
- *Community gardens:* These are spaces that rely on collaboration in shared open spaces where community residents share in the maintenance and growing of the garden, including healthful and affordable fresh fruits and vegetables.
- *Complete Streets:* This is a process of planning and building infrastructure systems that promote and increase safe access for all of its users. Complete Streets also prioritizes the needs of those whose needs aren't traditionally met over time, including older adults, people with disabilities, and those who don't have access to vehicles.
- *Density bonuses:* A density bonus is an incentive-based, inclusionary zoning policy that permits a developer to increase the maximum allowable development on a site in exchange for funds or in-kind support for specified public policy goals (e.g., affordable housing).
- *Ecosystem services:* These are the direct and indirect benefits that humans receive from the natural environment, such as providing food, clean air, and water, green space, maintaining biodiversity, and regulating human-induced climate impacts.

- *Farmers markets:* Farmers markets are a continuous assembly of farmers and local small businesses selling the food and products they have produced directly to the consumers, providing relationships and community building.
- *Food insecurity:* Food insecurity is defined as a household's or individual's inability to access the food they need in their community to meet their daily needs. Food insecurity is measured by analyzing the connection between food access and its closely linked indicators, such as poverty, unemployment, homeownership, and disability prevalence at the state level.
- *Food security:* The enhancement of current food sources to create more options for socially vulnerable communities.
- *Gross rent as a percentage of household income (GRAPI):* GRAPI measures the affordability of housing by indicating what percentage of household income is spent on rent. A popular guideline is the 30% rent rule, which suggests spending around 30% of gross income on rent. Spending more than this percentage would generally make housing unaffordable.
- *Heat island:* Urban growth increases the heat island effect, where structures such as roads, parking lots, and buildings absorb and re-emit the sun's heat more than natural landscapes such as forests and water bodies.
- *Impervious surfaces:* Impervious surfaces are anywhere there is pavement, such as asphalt, concrete, and brick. Impervious surfaces prevent rainwater from entering the soil. Therefore, it runs off in larger quantities into stormwater drains, increasing the occurrence of flooding. These surfaces also increase the intensity of the urban heat island effect.
- *Mixed-use development:* This involves integrating different types of land uses within a single neighborhood or development.
- *Mixed-use zoning:* This is a way to permit a mix of residential, commercial, and industrial uses into a single area, often through planned unit developments (PUD) in concentrated areas.
- *Nature-based solutions (NBS):* They leverage the ecosystems' processes and functions to restore environments and benefit residents by improving quality of life. NBS can include rain gardens, green roofs, bioswales, and more.
- *Parking minimums:* These are zoning requirements that mandate a minimum number of parking spaces that developers must provide for tenants when constructing new buildings.
- *Permeable surfaces:* These can be manufactured or naturally occurring. They allow water to pass through or be absorbed. These surfaces are solutions to stormwater management, especially when implemented with other sustainable practices.
- *Tax increment financing (TIF)* districts: These are areas where public infrastructure improvements are funded by the future increase in property tax revenues that those improvements generate.
- *Trail connectivity:* Trail connectivity is how well trails are interconnected to one another to improve access within the community. It is also how trails connect people to the nature around them.
- *Transit-oriented development (TOD):* Development that maximizes access to public transportation. TOD aims to reduce reliance on private vehicles and promote walking, cycling, and use of public transit.
- *Urban canopy:* This refers to the current tree cover that exists in a city. It is measured by the percentage of trees over land. Tree canopies can provide many benefits, especially cooling, resiliency, and habitats for wildlife.
- *Urbanization:* This is the process of cities growing, both in population and size. In the context of sustainability, rapid urban growth and changing environments have negative impacts on ecosystems and biodiversity. Urbanization increases the impervious surface cover in communities.
- *Vehicle Miles Traveled (VMT):* This calculates the total distance traveled by vehicles within a defined area over a given period of time. It evaluates transportation efficiency, environmental impact, and traffic congestion.
- *Walk and bike score:* The walk and bike scores analyze routes to nearby amenities and award more points based on distance and safety (Walk Score, 2024).

NATURE-BASED SOLUTIONS GOAL F

Goal F: Integrate nature-based solutions (NBS) into built environments to support sustainable urban growth.

The Big Picture: Urbandale is increasingly experiencing the impacts of urbanization and a changing environment, such as more frequent flooding, higher temperatures, and reduced air and water quality. Trees' carbon sequestration plays an essential role in mitigating these effects through the absorption of GHG emissions. NBS leverage the ecosystems' processes and functions to restore environments and benefit residents by improving quality of life. By implementing NBS in Urbandale, the growing community can support sustainable and innovative methods for adaptation and mitigation as well as enhance community character and awareness.

UN Sustainable Development Goal(s):

Sustainable Development Code(s): Infill development

Co-Benefits: Stormwater management, energy efficiency, partnership formation, future prosperity

City Assets: Urbandale can implement some of the actions described below on city-owned properties. First, permeable pavement should be explored in sidewalk areas and trails. To promote sustainable practices, the city can put permeable pavement in those areas to demonstrate feasibility, and sustainability in practice for residents to see when entering those buildings. Second, through a Green Roofs Program, Urbandale can promote sustainable growth by using their city-owned buildings and land to implement green roofs on new structures to demonstrate feasibility and impact on the built environment. A pilot project on a city-owned building can serve as an education center to answer questions surrounding green roofs, such as costs, maintenance, and benefits. This action by the city can lead to residents and developers implementing green roofs or other NBS on their properties.

Connection to Existing Plans: The *Forward Urbandale Comprehensive Plan* focuses on environmental stewardship as a central component of community development, particularly as the city expands into the Western Growth Area. Emphasizing conservation and sustainable practices, such as implementing permeable surfaces and enhancing stormwater management through expanding the Storm Water Grant Program, will safeguard vital ecosystems while accommodating urban growth. Moreover, initiatives like promoting educational signage in parks and trails aim to foster community engagement, ownership, and pride, further enhancing the overall quality of life in Urbandale.

Learning from Data

At the Chamber of Commerce event, one of the questions in the survey asked residents to rank sustainability strategies based on personal importance. Figure 4.1 shows that 'Infill Development' was voted most important by 58% of respondents. This demonstrates a need for sustainable infill development as residents rank this of high importance.

Figure 4.1 Voted Most Important as a Sustainability Strategy

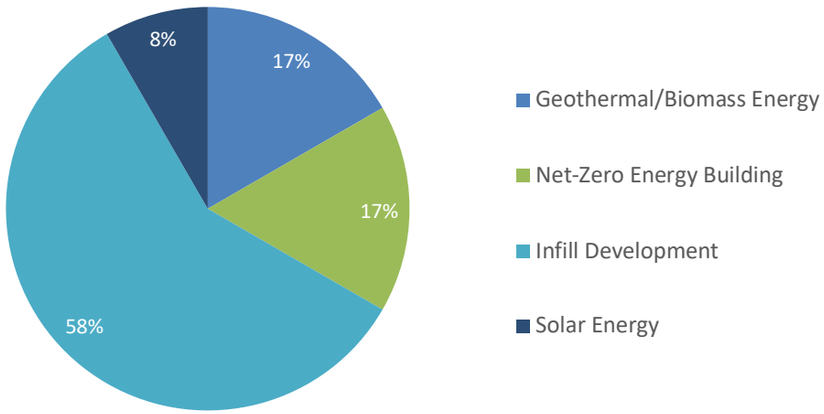


Figure 4.2 depicts the areas in Urbandale that have the highest levels of impervious surface, displayed in a darker blue. The areas of higher concentration are in the central region of the city, which has more commercial corridors. This information can indicate locations to improve stormwater management strategies, along with increases in the tree canopy.

Figure 4.2 Map of Impervious Surfaces in Urbandale

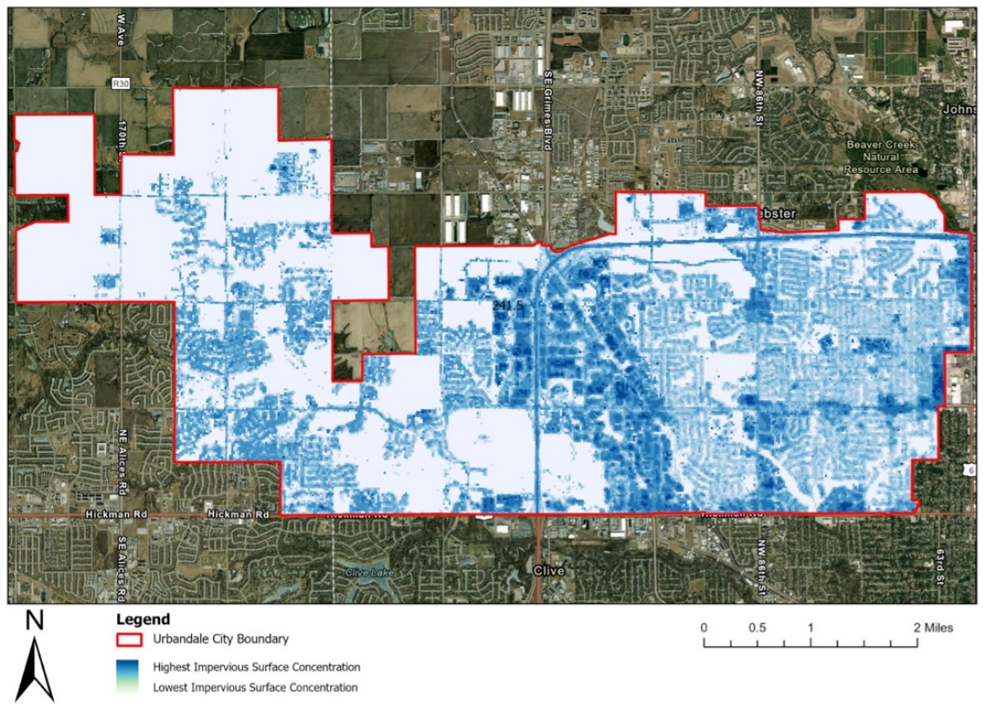
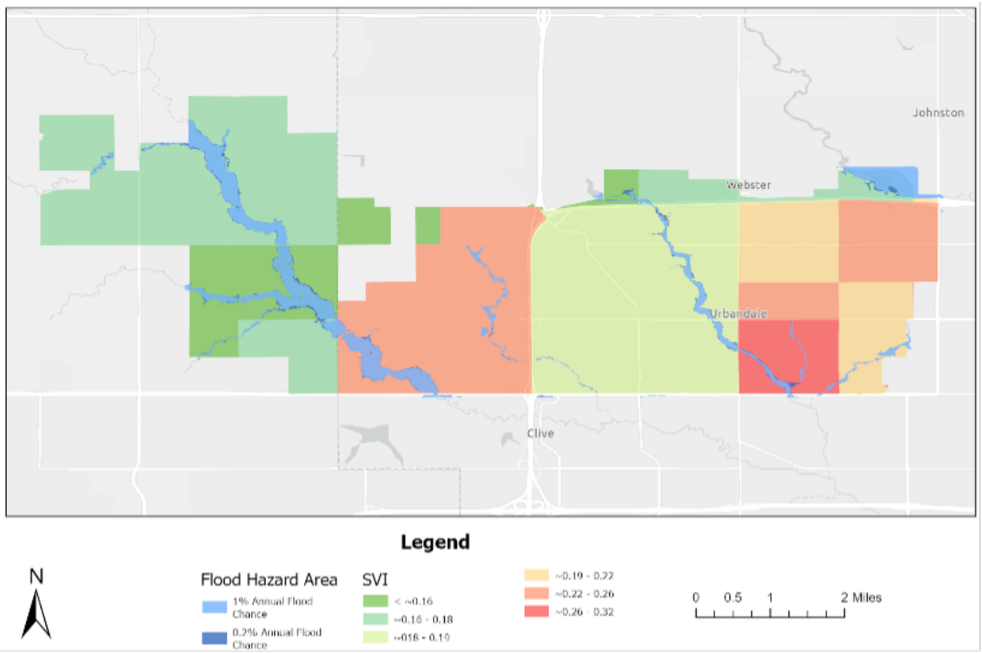


Figure 4.3 shows the Effective Flood Hazard Area from FEMA and overlays it onto the Social Vulnerability Index (SVI) Map. In Urbandale, social vulnerability levels are high in the southeastern census tracts and central areas. Flooding and stormwater runoff may contain harmful water pollutants that disproportionately impact socially vulnerable communities.

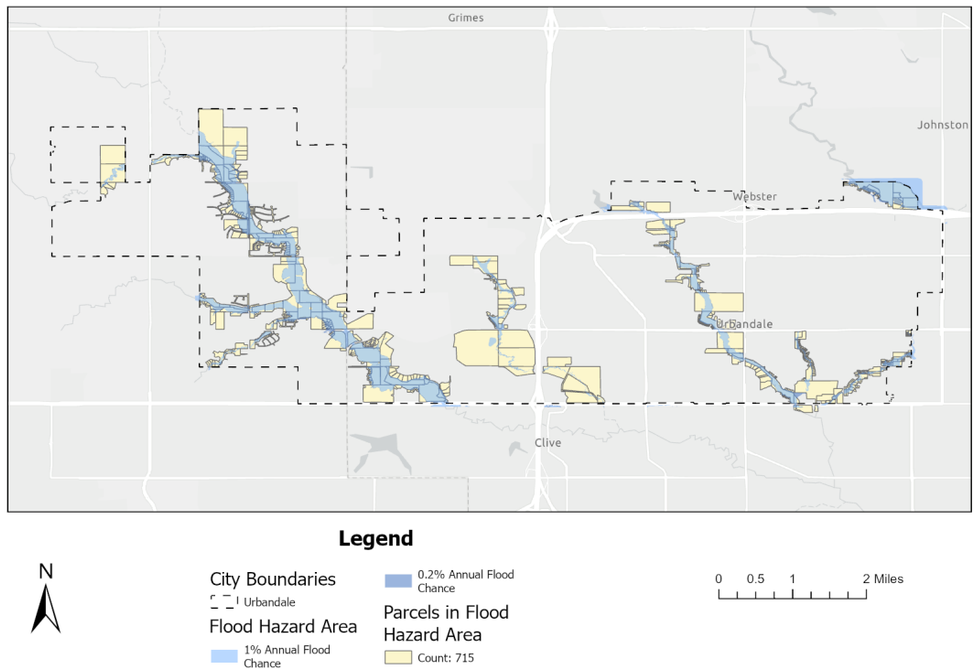
Figure 4.3 Map of Effective Flood Hazard Areas in Socially Vulnerable Areas of Urbandale



Source: City of Urbandale, FEMA, 2019.

In Urbandale, there are 715 parcels that fall within the Flood Hazard Area, as seen in Figure 4.4. Out of 715 parcels, 232 of those parcels are in census tracts that are deemed 'socially vulnerable.' This map highlights the need for intervention with nature-based solutions, especially along the eastern and central west sides, to limit the impacts of stormwater runoff.

Figure 4.4 Map of Flood Hazard Areas in Urbandale



Source: City of Urbandale, FEMA, 2019.

ACTIONS FOR GOAL F

Action F1: Prioritize NBS in stormwater management strategies (long-term, adaptation).

Through this action utilizing NBS, the city leverages the ecosystems' processes and functions to restore environments and benefit residents by improving their quality of life. NBS can be used to mitigate flooding and stormwater, reduce risks to hazards by enhancing resiliency, increase access to urban agriculture, and increase biodiversity. NBS can include rain gardens, green roofs, bioswales, and more.

Visualized in Figure 4.5, bioswales are channels designed to concentrate and convey stormwater runoff while removing debris and pollution. Through these strategies, plants and soils help clean and absorb rainfall runoff to clean the water before it soaks into the ground. The city should implement these mechanisms in new public infrastructure projects and green spaces.

Figure 4.5 Solution to Stormwater Management Through Bioswales

Source: Pal, K., 2023.

Potential Partners: Iowa Stormwater Education Partnership (ISWEP), Iowa Department of Natural Resources (DNR), Iowa Department of Agriculture.

Funding: National Fish and Wildlife Foundation (NFWF) and America the Beautiful Challenge.

Community Engagement: The city will send public surveys to every resident to express their voice and thoughts on stormwater management strategies, design, and aesthetics in Urbandale. To show how these solutions can support sustainable development, engagement events where NBS has been implemented will be hosted.

Equity & Justice: Many parts of the city are disproportionally impacted by flooding or water pollution. Using NBS will improve stormwater systems and minimize social disparities. The city will collaborate with green job training programs when implementing NBS to support socially vulnerable residents in the green economy.

Monitoring Success of Action F1:
Quantitative Metrics: 1) Number of stormwater management projects implemented each year. 2) Water quality tests to understand which strategies filter pollutants the most. 3) Track changes in the projects and spaces that use NBS, regarding how often flood events occur in spaces that implement these solutions.

Qualitative Metrics: 1) Residential feedback from annual focus groups or engagement events to understand how they view the beauty and activation of space from these practices. 2) Propose a report from the Engineering and Public Works Department on how the practices are actively holding up for maintenance and costs. 3) Gain the perspective of developers through annual focus groups on those who include these strategies versus those who do not.

Action F2: Promote and expand the *Storm Water Grant Program* to include green roofs (short-term, adaptation).

The existing Urbandale Storm Water Grant Program covers partial costs for stormwater management measures, such as drain tiles, rain gardens, and soil quality restoration. It is

important to include green roofs in the program as they offer stormwater management benefits as well as co-benefits from energy efficiency, green space, and more.

Potential Partners: ISWEP, Iowa DNR, Iowa Department of Agriculture.

Funding: Storm Water Grant Program.

Case Study: Toronto, Canada implemented the *Toronto Green Standard* in 2010, which requires new private and city-owned developments to follow energy-efficient practices. Financial incentives can be applied for based on a tiered efficiency list, providing incentives at tiers 2-4. Figure 4.6 shows the green roofs applied to industrial, commercial, institutional, and residential buildings four stories and higher. Since its creation, it has resulted in a reduction of 6.3648 megatons of carbon dioxide equivalent (CO2e) annually and expects to reduce emissions by 30.6 megatons of CO2e by 2050.
Source: City of Toronto, 2022.

Figure 4.6 Green Standard Green Roof

Community Engagement: The Storm Water Management Grant will be promoted by attending community events such as Party in the Park. Organizing a booth or table will help Urbandale residents learn about green roofs and ask questions about the program. The city will ask for their feedback to understand the successes or failures of green roof projects and what other projects residents would like to see in their community.

Equity & Justice: For the installation and maintenance of green roofs, the city will collaborate with green job training programs. By providing training and job placement services directly within socially vulnerable communities, Urbandale ensures that residents can benefit from green roofs without facing the risk of displacement.

Monitoring Success of Action F2:
Quantitative Metrics: 1) Number of applications for the stormwater grant program. 2) Track the percent change in applications after including green roofs to understand if adding green roofs has increased the awareness of the program. 3) Number of accepted applications for the stormwater grant program. 4) Change in public awareness when asking if residents have heard about the program before seeing it in an annual survey. 5) Track the costs/savings associated with green roofs on city-owned buildings.

Qualitative Metrics: 1) Residential feedback through annual focus groups on how successful the results of their project were. 2) Testimonials through engagement or annual interviews from residents through engagement events on why they chose to do a stormwater project. 3) Feedback from developers on their green roof project to understand its effectiveness.

Action F3: Explore the use of permeable surfaces on city-owned properties (long-term, adaptation).

Permeable surfaces include various types of pavements like brick pavers, porous asphalt, and permeable pavers. Urbandale can learn from case studies and conduct pilot programs around the city.

Potential Partners: Iowa Environmental Council and Iowa League of Cities.

Funding: Iowa Department of Agriculture and Land Stewardship (IDALS), Water Quality Initiative Program and Iowa Department of Agriculture and Land Stewardship (IDALS), Iowa Conservation Infrastructure Project Program.

Case Study: The City of Clinton, Iowa, has completed 10 blocks of permeable pavement over four years, including various types like brick pavers, porous asphalt, and permeable pavers, visualized in Figure 4.7. These projects, in both busy commercial and quiet residential areas, have successfully reduced flooding and basement backups. Maintenance includes yearly cleaning and chip replacement, but it's manageable and scheduled. Recent installations used larger voids between pavers to allow water drainage without sediment buildup, reducing the need for invasive cleaning. Though maintenance is required, the City of Clinton noted that it is a worthwhile trade-off for the stability and gratitude it brings to the city, business owners, and residents.

Figure 4.7 Permeable Pavement

Source: Iowa League of Cities, 2021.

Community Engagement: The city should host engagement events where permeable pavement has been implemented to solicit feedback and understand residents' views on NBS. Engagement events and online tools can be used to understand how these projects should be designed, implemented, and monitored.

Equity & Justice: To support equity and justice, Urbandale can implement permeable surfaces in areas of the city that are disproportionally impacted by flooding or water pollution. It is beneficial to collaborate with green job training programs for the installation and maintenance of permeable surfaces.

Monitoring Success of Action F3:

Quantitative Metrics: 1) Number of permeable pavement projects that are implemented by the city. 2) Percent change in the construction and maintenance costs of different types of paths. 3) Change in average trail users on sustainable use paths versus concrete paths. 4) Track the number of flooding events that occur once these practices are implemented

Qualitative Metrics: 1) Residential feedback from focus groups or engagement events on the aesthetic and satisfaction of using permeable paths. 2) Collect the perception from residents and stakeholders through annual interviews on flooding events. 3) Propose an annual report by the key stakeholders, such as public works and parks, on the usability and effectiveness of the trails.

Action F4: Increase educational signage along public trails and green spaces (mid-term, adaptation).

Focus the use of signage on building environmental awareness, such as information about native plants and animals. Information about NBS along trails can be included to help build an understanding of the implemented strategies. Including QR codes in signage can increase accessibility by providing language interpretation and links to more resources.

Potential Partners: Polk and Dallas County Conservation Boards.

Funding: Environmental Protection Agency (EPA) Environmental Education Grants.

Case Study: The City of Iowa City, Iowa, implemented permeable pavement and a green roof in their composting and recycling center, displayed in Figure 4.8. Facility and city leaders discovered that the permeable surfaces worked best on walking trails and low-traffic areas. Additionally, there is a bioswale on site to further reduce stormwater runoff. The facility is classified as an Environmental Management System by the Iowa DNR and provides significant opportunities for education to residents, business owners, and developers.
Source: City of Iowa City, n.d.

Figure 4.8 Iowa City's Green Wall

Community Engagement: Community events, such as Party in the Park and the Sustainability Fair, will be held with drafts of potential signage. The city will ask residents what environmental topics they want to know more about, how much they currently know about certain topics, and how they think signage contributes to the awareness and aesthetics of their community through the community survey.

Equity & Justice: It is important to include multilingual content to enhance educational signage throughout the park system or provide QR codes linking to multilingual resources. Urbandale will continue to engage with residents and provide compensation for their time to express their value and ensure the park system can meet the needs of all residents. This will build trust and relationships with socially vulnerable groups to better meet their needs.

Monitoring Success of Action F4:
Quantitative Metrics: 1) Number of educational signs and opportunities on trails and in public spaces. 2) Percent change in trail users and public space in areas of educational opportunity. 3) Percentage of increase through annual surveys in public awareness of native plants and animals in Urbandale by asking if they have seen and read the signage in certain areas.

Qualitative Metrics: 1) Perception of trail users and conservation proponents on the success of the educational signage. 2) Conduct focus groups to all residents on the effectiveness of the educational opportunities. 3) Testimonies from younger residents on how they learned through the information presented to them along the trails.

ECOSYSTEM SERVICES GOAL G

Goal G: Enhance ecosystem services as a critical component of resiliency, promote biodiversity, and protect environments from the effects of urbanization.

The Big Picture: Urbanization and a changing environment threaten the vitality of Urbandale's ecosystems of natural resources, native species, and public well-being. Rising temperatures and urban heat islands, for instance, create greater risks to human health, especially among socially vulnerable populations. Ecosystem services are the direct and indirect benefits that humans receive from the natural environment, such as providing food, clean air and water, green space, maintaining biodiversity, and regulating human-induced climate impacts. By implementing this goal, Urbandale can leverage the power of ecosystem services to conserve existing environments and enhance the quality of life for all residents, resulting in a more resilient community.

UN Sustainable Development Goal(s):

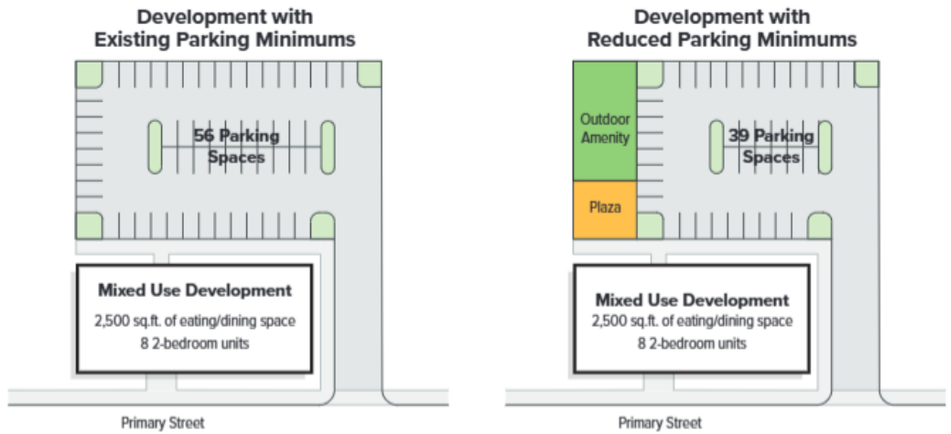
Sustainable Development Code(s): Infill development

Co-Benefits: Community development, future prosperity, partnership formation, stormwater management

City Assets: Urbandale can prioritize and promote the use of local flora and fauna in parks, open spaces, and municipal buildings. First, planting native species and introducing bird and bat boxes can support local wildlife through the restoration of ecosystems. Exemplifying the beauty, sustainability, and feasibility of these projects can encourage residents to plant native species on their own properties. Additionally, these projects provide opportunities for education and awareness surrounding sustainability and biodiversity. Second, through an urban tree canopy project, Urbandale can increase the urban tree cover and forestry by planting more trees in existing city-owned green spaces and incorporating them into future development projects. Urbandale can also include more urban forests in and around natural resource areas, promoting environmental stewardship to the community.

Connection to Existing Plans: The overarching goal and six actionable items serve to align with the *Forward Urbandale Comprehensive Plan*, the *Parks Master Plan*, and the *Urbandale Complete Streets Plan*. Action G1 directly relates to the Comprehensive Plan by reducing parking minimums, as displayed in Figure 4.9. Replacing these parking areas with green space follows the Complete Streets' desire to add more vegetation and increase pedestrian access through foot traffic and bicycling. Actions G3, G5, and G6 directly connect to the *Parks Master Plan* by including native species in public green spaces. Adding Actions G2 and G6 take the ideas a step further by incentivizing native growth on residential property as well.

Figure 4.9 Forward Urbandale Comprehensive Plan, Parking Minimums



Learning from Data

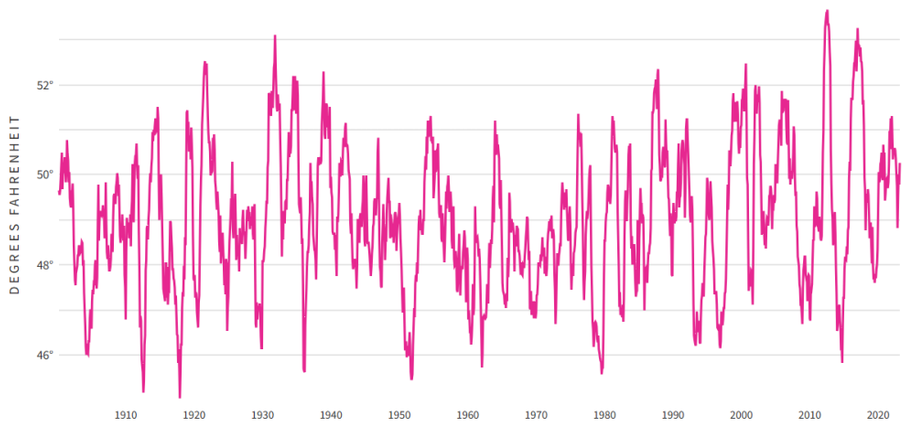
During the focus group meetings, themes regarding infill development and conservation arose. Participants expressed the need for easy access to a well-connected walkway system from the east side of Urbandale to the west side. Residents would like to walk throughout the entire city without reliance on motor transportation. Urbandale already has a good trail network but increasing walkable access to both sides of the city would allow residents to commute fluidly. Throughout this engagement activity, the participants indicated how they felt about the safety and the parks themselves. Increasing access to these parks while also enhancing these areas can increase the use and connectivity of Urbandale's public spaces.

As a family, we like to go together and walk to the parks because it is peaceful.

We feel it is really safe for their children and let them go to the park themselves.

Annual and monthly temperature averages are increasing in Urbandale due to fossil fuel usage and the GHG effect. Figure 4.10 displays rising temperatures in Dallas County. In Dallas County, the 12-month temperature average increased by 0.6°F between May 1900 and April 2023. From May 1900 to April 2023, the 12-month temperature average was 49°F. Increased temperatures can exacerbate the urban heat island effect, pose risks to human health, cause frequent and intense natural disasters, and degrade natural ecosystems. Even 0.5 degrees Fahrenheit of warming is associated with detrimental changes to the climate.

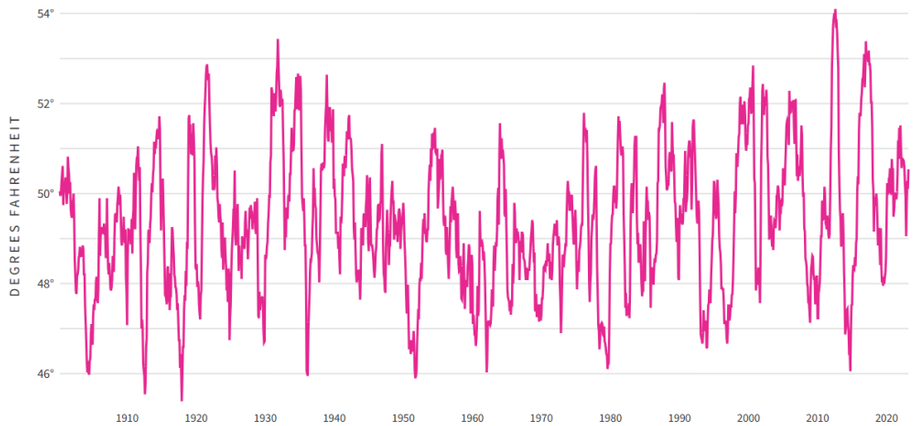
Figure 4.10 12-Month Temperature Averages in Dallas County



Source: National Centers for Environmental Information, 2024.

Figure 4.11 indicates rising temperatures in Polk County. In Polk County, the 12-month temperature average increased by 0.5°F between May 1900 to April 2023. From May 1900 to April 2023, the 12-month temperature average was 49°F. Prioritizing conservation and natural resources in Urbandale will lead to a more resilient community and reduce the impacts of rising temperatures.

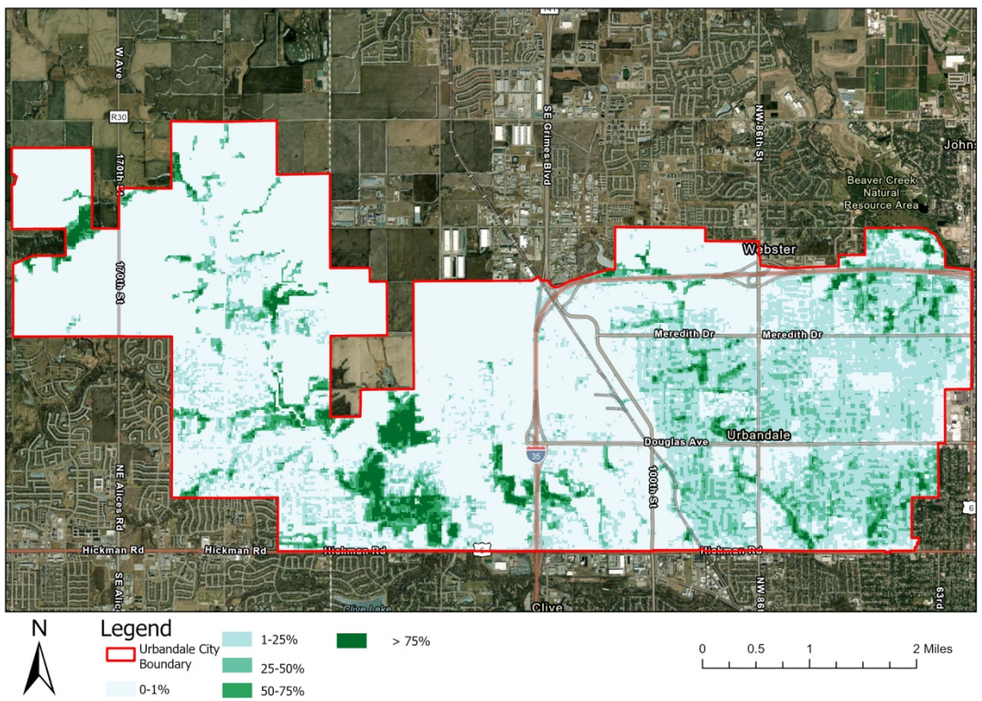
Figure 4.11 12-Month Temperature Averages in Polk County



Source: *National Centers for Environmental Information, 2024.*

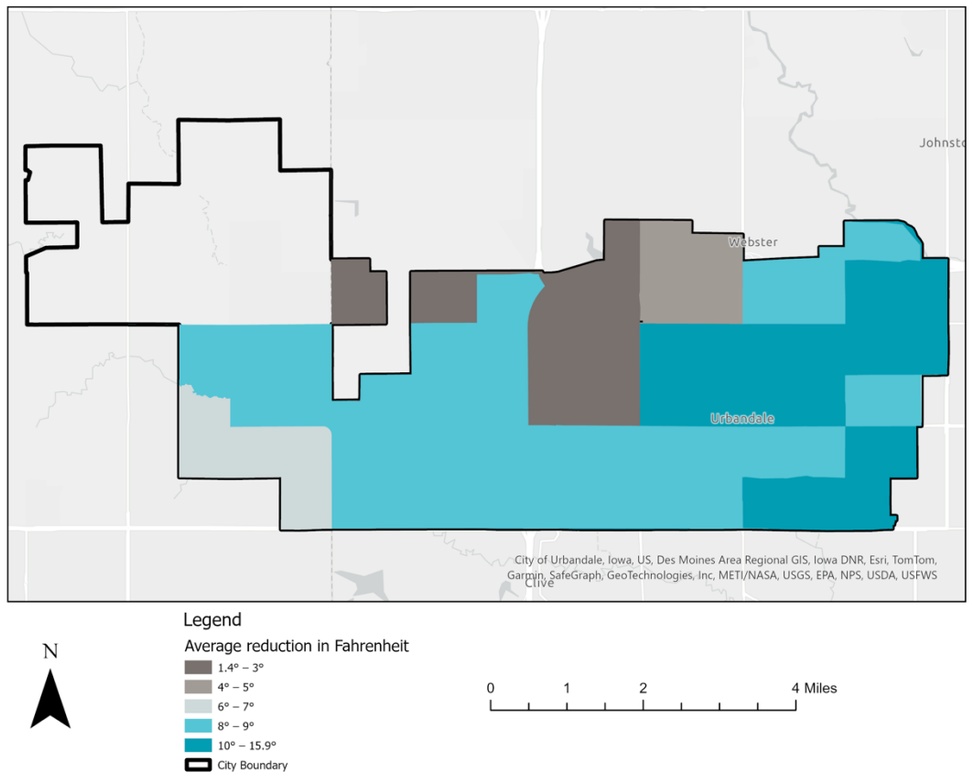
The map in Figure 4.12 reveals that much of Urbandale has a very low percentage of tree cover. The eastern side of Urbandale tree coverage is far more evenly spread across the land than the western side. The western portion of Urbandale has pockets of high density, greater than 75%, but mainly falls between 0-1% coverage. This map showing the percentage of tree cover across the city highlights areas where tree cover can be increased throughout Urbandale.

Figure 4.12 Percentage of Tree Coverage



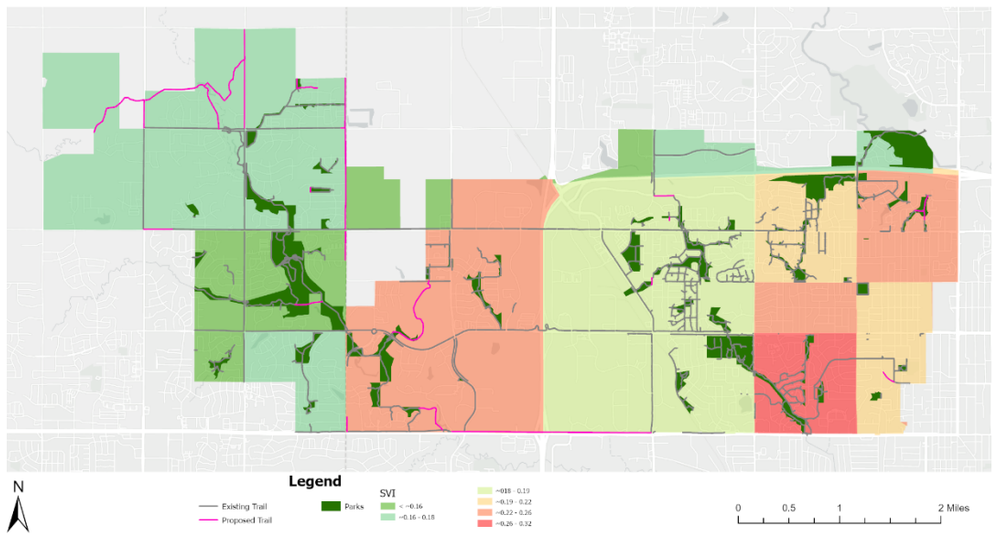
As seen in Figure 4.13, at night, ambient temperatures in Urbandale are relatively high and the tree canopy over roads is low. As a result, there are fewer opportunities for recreation, a lack of pedestrian transportation, more stormwater runoff, and higher urban temperatures, exhibiting a heat island effect. These trends pose risks to human health, which can exacerbate existing inequities and injustices.

Figure 4.13 Nighttime Ambient Temperature



Access to parks and trails in Urbandale varies depending on the neighborhood. As presented in Figure 4.14, socially vulnerable areas of the community, those in orange and red, have less access to the parks and trail networks. Poor trail connectivity leads to reliance on vehicle travel; this restricts opportunities for pedestrian and bicycle transportation, further limiting the accessibility of Urbandale's green spaces. Parks and trails provide opportunities for recreation, improvements in mental and physical well-being, and crucial ecosystem services. This map of the parks and trails system can help increase the availability of green spaces, especially in areas marked as socially vulnerable.

Figure 4.14 Parks and Trails Proximity to Socially Vulnerable Areas



Source: City of Urbandale, 2019.

ACTIONS FOR GOAL G

Action G1: Reduce parking minimums to provide opportunities for green space (short-term, adaptation).

Reduce the parking minimums for future development in Urbandale. In the areas that would have been used for parking, encourage the addition of green spaces for residents and patrons to use.

Potential Partners: Local developers and business owners.

Funding: This action does not require funding unless there is an incentive.

Community Engagement: Reducing parking minimums requires community engagement through pre-existing events to encourage input on green spaces in these developments. This ensures public awareness of how the changes may impact the built environment. After implementation, city leaders can engage with residents within these green spaces to further understand their perceptions, experiences, and thoughts on the changes.

Equity & Justice: Providing accessible areas for recreation to all residents will enhance walkability and biking in areas with limited transportation options and access. The city will conduct engagement sessions to understand how parking reductions can support socially vulnerable residents' mobility, access to green space, and more.

Monitoring Success of Action G1:
Quantitative Metrics: 1) Number of developments that incorporate green space with reduced parking. 2) Number of people who visit the green spaces, demonstrating the use and evaluation of these spaces. 3) Temperature changes in developments before and after incorporating green space.

Qualitative Metrics: 1) Feedback through annual meetings and discussions about whether they use the green spaces. 2) Perceptions through interviews with developers or businesses on the green spaces and whether they have seen increases in the use of the areas. 3) Testimonials through engagement and talks with developers and residents on their experiences constructing these areas.

Action G2: Amend the zoning ordinance to classify the growth of native plants as permitted or by-right uses on private property (short-term, adaptation).

Amend the ordinance to permit private property owners to grow native species on their land. Making this a by-right will also streamline the process for those wanting to include native growth on their property.

Potential Partners: None.

Funding: This action does not require funding.

Case Study: The Minnesota Board of Water and Soil Resources implemented a statewide program to offer a combination of resources to increase installations of pollinator-friendly native plantings in residential lawns. This initiative offers resources such as workshops, coaching, planting guides, and grants to help residents increase native flora on their property. This program is an effective way to increase biodiversity and the natural ecosystems of Minnesota. Through this program, 12 million square feet of pollinator and native species have been planted, supporting the 450 different bee species Minnesota is home to; one example is shown in Figure 4.15. This statewide program has received 30,000 applications, all of which have been awarded to residents and their projects. 40% of the grants have been given to those in environmental justice focus areas, created by Minnesota. These resources have helped tremendously in resiliency, adaptation, and mitigation of the existing climate. Through this program and its supporting projects, it has captured more than 160 metric tons of carbon per year and more than 3 million cubic feet of water before it reaches streams and rivers per year.
Source: *Lawns to Legumes, n.d.*

Figure 4.15 Pollinator Lawn

Community Engagement: When amending the zoning ordinance, holding public meetings and hosting community events is essential. At these events, the city and residents will co-create lists of native species to allow, as well as guidelines on where they may be planted.

Equity & Justice: The city will provide accessible areas for recreation to all residents. This will enhance walkability and biking in areas with limited access to transportation options. Engagement sessions will be conducted to understand how parking reductions can support socially vulnerable residents' mobility, access to green space, and more. Compensation will be provided to express gratitude for participants' time and increased attendance.

Monitoring Success of Action G2:
Quantitative Metrics: 1) Number of properties that implemented native plants. 2) Reductions in requests for variances or permissions from the city for native plants. 3) Percent change in flooding events from areas that incorporate native growth.

Qualitative Metrics: 1) Feedback through annual focus groups with residents on planting native species on their land. 2) Testimonials through community engagement from residents on how these changes have allowed for increases in planting as well as benefits to their properties.

Action G3: Adapt public green space to include more local flora and fauna (mid-term, adaptation).

Install bat and bird boxes on city properties to support biodiversity and plant native flora in rain gardens within city parks.

Potential Partners: Earl May Nursery & Garden Center

Funding: Iowa Native Plant Society Small Grants Program.

Community Engagement: The city will include residents in the design and decision-making processes through different committees, like the Public Art Committee and the Parks and

Recreation Commission. This ensures that what each new green space looks like and what kinds of local flora to plant will appeal to the community.

Equity & Justice: It is important to incorporate local flora and fauna in socially vulnerable areas with limited access to green spaces. This ensures a more equitable distribution of ecosystem services and health benefits such as improved air and water quality, enhanced mental and physical health, and increased community resilience.

Monitoring Success of Action G3:
Quantitative Metrics: 1) Number of green spaces that incorporate fauna and flora. 2) Percent change in number of people who visit spaces with local flora and fauna and those that don't have flora and fauna through annual trail counts by trail user counters that can be installed.

Qualitative Metrics: 1) Feedback through annual focus groups from residents on what spaces they visit, what species appeal to them, and why, to increase desired greenery. 2) Testimonials through community engagement from residents on ways to increase the use of public spaces with local flora and fauna.

Action G4: Prioritize development in areas less susceptible to environmental risks (long-term, mitigation).

Prevent development in flood-prone areas. Land in flood-prone areas can be less expensive to develop. Prioritizing the development of affordable housing and other essential services in low-risk flood areas ensures safe and secure living environments for socially vulnerable communities.

Potential Partners: Local developers and Polk County and Dallas County Emergency Management.

Funding: This action does not require funding.

Community Engagement: Urbandale residents should be fully aware of potential environmental risks to their properties. Community engagement is needed to further understand how climate-related events, such as flooding, impact residents and the environment. Focus group discussions can offer deeper insights into how residents and developers manage environmental risks and how the city can encourage development away from susceptible areas.

Equity & Justice: Prioritizing the development of affordable housing and other essential services in low-risk areas ensures that socially vulnerable residents have access to safe and secure living environments. It is crucial to build trust and have effective communication with residents to guarantee awareness about potential environmental risks to their properties.

Monitoring Success of Action G4:
Quantitative Metrics: 1) Number of buildings that are flooded or damaged in natural disasters. 2) Amount of money that is spent per year to repair damaged buildings after a natural flood disaster.

Qualitative Metrics: 1) Feedback through annual focus groups from developers on changes in development areas and personal experience with their properties. 2) Testimonies through community engagement from homeowners and developers on how lives have changed from where buildings are located. 3) Annual reports on how these changes have affected development decisions.

Action G5: Increase tree canopy and urban forestry (long-term, adaptation/mitigation).

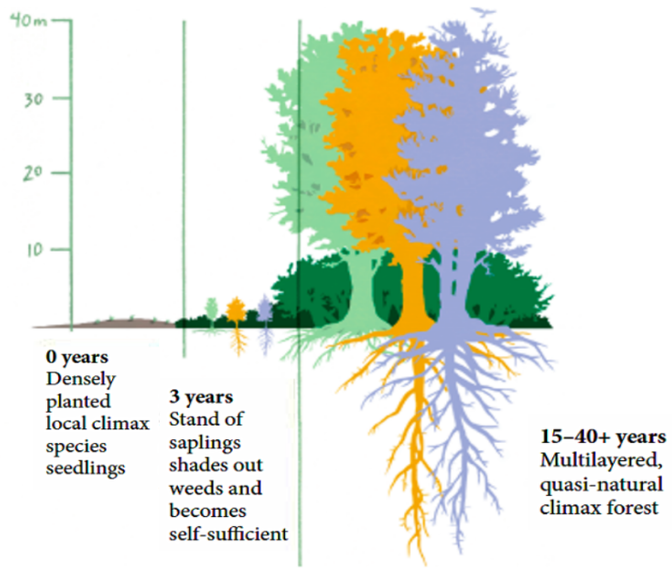
Increase tree canopy in areas with little protection from sunlight and weather. Support the implementation of urban forestry using the "Miyawaki Method."

To implement this action, Urbandale can identify trees best suited for the local environment. Modifying zoning regulations and designing a residential rebate program to incentivize planting native species will require a list of allowable species. Additionally, the

list is important when incorporating local flora and fauna in public green spaces. Aiming to increase tree canopy and urban forestry will also rely on a list of allowable species.

Observed in Figure 4.16, the Miyawaki Method is a unique growth process that re-creates the conditions of centuries-old natural forests to quicken the growth process of mature, biodiverse ecosystems.

Figure 4.16 The Miyawaki Method



Source: Lewis H., 2024.

Potential Partners: Parks & Recreation, Tree Board, community leaders, Dallas County and Polk County Conservation.

Funding: MidAmerican Trees Please! and Iowa Department of Natural Resources (DNR) Community Forestry Grant.

Case Study: The city of Cambridge, Massachusetts, implemented one of the first Miyawaki mini-forests in the U.S. through community engagement and partnerships (Biodiversity for a Livable Climate, 2023). The Miyawaki Method is an innovative and effective way to boost ecosystem services and mitigate CO2 emissions. It involves site identification, soil rejuvenation, native species planting, and maintenance for the first two to three years. Research found that the Miyawaki Method reduced local temperatures by a minimum of two degrees Celsius and improved air quality (Manuel, 2020). Mature mini-forests were found to reduce noise pollution by 10 dB, and biodiversity on average was 18 times higher (Manuel, 2020). Fortunately, these mini-forests can thrive in infill areas, as 300 trees can be planted within 1,000 square feet. By restoring crucial ecosystems in urban areas, mini-forests offer unique solutions to mitigate and adapt to climate and urbanization impacts and strengthen community engagement.
Source: Biodiversity for a Livable Climate, n.d.

Community Engagement: Community engagement is a key pillar of the Miyawaki Method. The first step is to form a team of local experts and community leaders (knowledge about ecology and native species, landscape professionals, county conservation members, plant nurseries, and more). Upon implementation of the mini-forest in an infill site, Planting Day would engage the community to celebrate the project. Elected officials, tribal leaders, families, and children will enjoy food and music and learn about the importance of urban forestry, sustainability, and building resilience.

Equity & Justice: Urbandale will collaborate with green job training programs to identify heat islands and increase tree canopy and urban forestry in disproportionally impacted areas.

Monitoring Success of Action G5:
Quantitative Metrics: 1) Number of trees planted per year. 2) Number of mini-forests planted per year. 3) Measurement of tree growth in mini-forest per year. 4) Number of attendees at the Planting Day ceremony upon implementation. 5) Temperature changes in mini-forests. 6) Tree density (planting and growth).

Qualitative Metrics: 1) Feedback through annual focus groups from residents, supplemented by discussions on which areas have the highest biodiversity. 2) Annual reports on differences in temperature, air quality, or appearance in areas where implemented. 3) Feedback through annual interviews with developers or organizations with mini-forests to gain their knowledge of the implementation process.

Action G6: Establish a residential rebate program to incentivize planting native species (short-term, adaptation/mitigation).

Create a rebate program that focuses on providing rebates to residents for planting native species. This program would pay for only the plants themselves, not including labor and construction costs. The rebate program can be structured to offer higher financial incentives to low-income and socially vulnerable residents.

Potential Partners: Earl May Nursery & Garden Center and ISU Extension & Outreach Master Conservationist.

Funding: Iowa Native Plant Society (INPS) Small Grants Program.

Community Engagement: Partnerships will be created with local non-profit organizations to host customized workshops focused on sustainable gardening and educating about the benefits of planting native species (cleaner air, stormwater management, etc.).

Equity & Justice: The city will offer financial incentives to low-income and socially vulnerable residents to reduce the cost barrier to planting native species and participating in sustainable initiatives. This will build trust and effective communication with socially vulnerable communities to ensure accessibility and awareness of the program. To further this, partnering with local non-profit organizations will provide additional support, resources, and outreach from established organizations in the community.

Monitoring Success of Action G6:
Quantitative Metrics: 1) Number of applicants. 2) Track yearly applicant awards. 3) Differences in native plant inventories throughout the city before and during the program.

Qualitative Metrics: 1) Feedback from residents through City Hall meetings and discussions on personal experiences with the program and planting native species. 2) Testimonials from all residents on how planting native species has changed the aesthetics of their properties. 3) Perform annual reports on the successes of the program.

URBAN MOBILITY GOAL H

Goal H: Increase access to walking and biking infrastructure to reduce carbon emissions.

The Big Picture: Most Urbandale residents rely on personal vehicles to travel throughout the city and current pedestrian transit is deemed unsafe and disjointed. Currently, the community lacks connective pathways to access public amenities. Creating safe bike lanes and sidewalks to vital places of interest in Urbandale is essential for encouraging residents to reduce reliance on personal vehicles. With the development of sustainable modes of transportation, Urbandale can encourage citizens to opt for walking and cycling throughout the city. By creating connected, pedestrian- and bike-friendly infrastructure, carbon emissions can be reduced.

UN Sustainable Development Goal(s):

Sustainable Development Code(s): Infill development

Co-Benefits: Connectivity enhancement, community development, and partnership formation

City Assets: Urbandale can further support sustainable modes of transportation by enhancing the sidewalks around city-owned buildings. Improving wayfinding signage can help pedestrians navigate more efficiently, and better lighting increases safety and comfortability. The city can upgrade the quality of its sidewalks by repairing cracks and uneven surfaces. It is also important to maintain and clean sidewalks around city-owned buildings regularly to provide a pleasant experience; this makes walking and biking a more attractive mode of transportation in the city.

Connection to Existing Plans: This goal intends to align with the *Complete Streets Master Plan*. With this plan, the city gathered recommendations through engagement sessions and identified various forms of pedestrian and bike-friendly infrastructure that the community is 'very comfortable' using. With input, the City of Urbandale established the Complete Streets Network to help guide the development of new transportation infrastructure and identify areas where further connectivity can be established.

As identified within the *Complete Streets Master Plan*, there is a high demand for connecting parks and recreation centers to trailways within the east corridor of Urbandale. The city has already invested in bike- and pedestrian-friendly infrastructure and has set forth plans to implement sustainable modes of transportation. The areas in high demand for more bike and pedestrian infrastructure are concentrated in Walnut Creek Regional Park and Little Walnut Creek. These trailways could be extended to add further connectivity to the western region of Urbandale, which has few walkable areas comparatively. Utilizing and expanding such plans is essential in creating a more connected and livable Urbandale.

Learning from Data

During the focus group, participants noted a desire to increase urban mobility options to access amenities in Urbandale. Participants wish to easily and safely travel throughout the city without reliance on motor transportation. There is an unmet need for well-connected walkway systems from the east side of town to the west side.

It is hard to go to other places to buy food by walking because there is no footpath.

During the library event, survey respondents were asked if they thought infill development should include walkable and bikeable areas. As Figure 4.17 shows 75% of respondents strongly agree that infill development should include pedestrian-friendly and bikeable spaces. Urbandale should continue enhancing pedestrian infrastructure when developing infill projects.

Figure 4.17 Infill Development as Walkable and Bikeable Spaces

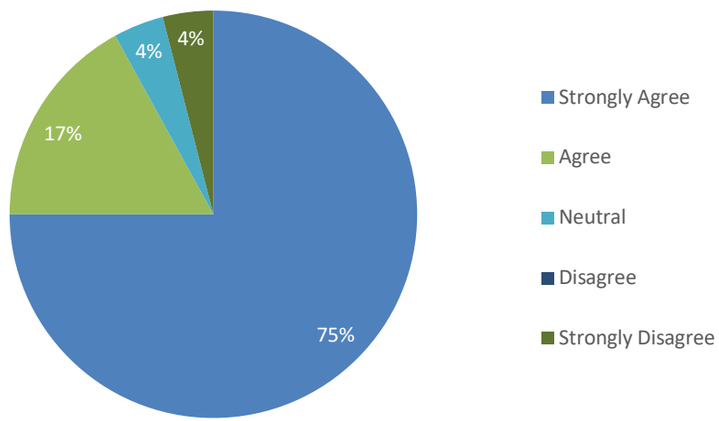
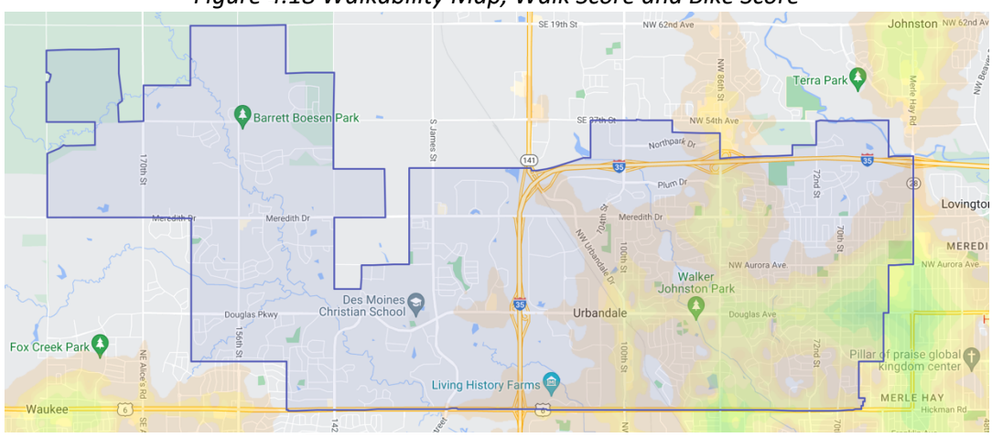


Figure 4.18 shows that on the national scale, Urbandale has low bike and walk scores. The city's bike score is 38 and its walk score is 32. The highest score a city can receive is 100, in which daily errands do not require a car. Urbandale's scores indicate that it is a very car-dependent area. These scores may be influenced by the fragmented paths throughout the city and the lack of connectivity between east and west Urbandale. Figure 4.17 also displays the walkability map to visualize the scoring system. The walkability map assesses trail connectivity and identifies disjointed areas that lack easily accessible amenities. Walkability is often displayed as a heat map, highlighting locations in various colors to emphasize the levels of walkability. The green and yellow regions in the eastern portion of Urbandale show a higher score of walkability. As the score decreases, it transitions to orange and red, showing areas where residents have more difficulty transporting between locations. The western side of Urbandale lacks walkable amenities, as indicated by the absence of color on the map.

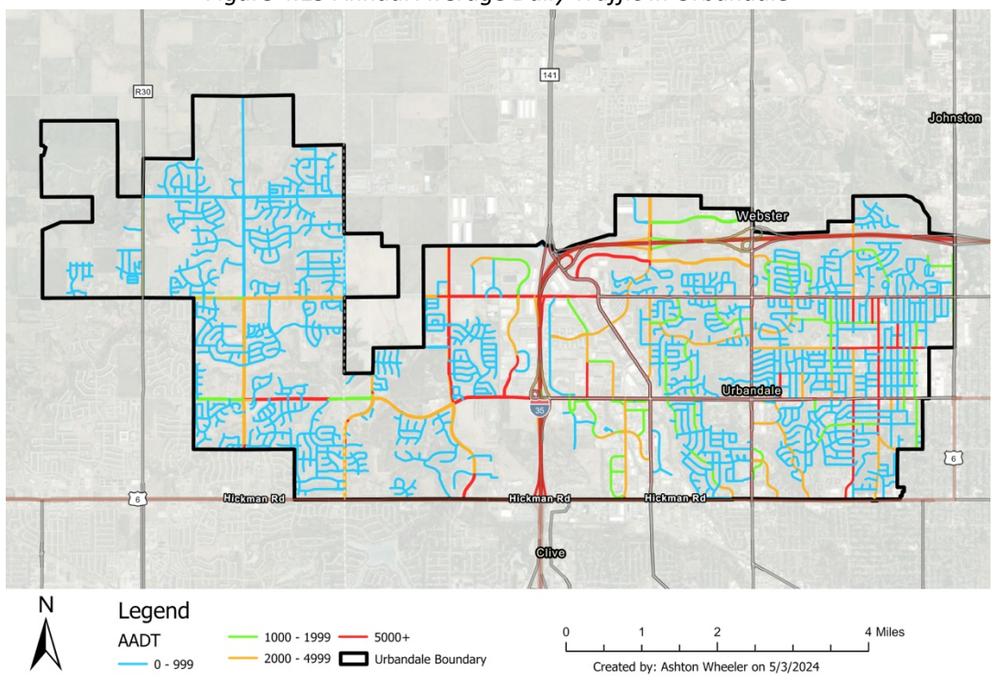
Figure 4.18 Walkability Map, Walk Score and Bike Score



Source: Walk Score, 2024.

The annual average for daily traffic in Urbandale is shown in Figure 4.19. The roads highlighted in blue represent areas with the least traffic and those in red display the highest traffic areas. It is beneficial to know Urbandale's traffic data as it may indicate where residents are less likely to walk, due to feeling unsafe on heavily trafficked roads. This supports the identification and creation of trails and paths that would best suit residents to bypass hazardous streets or make walking along these roads safer.

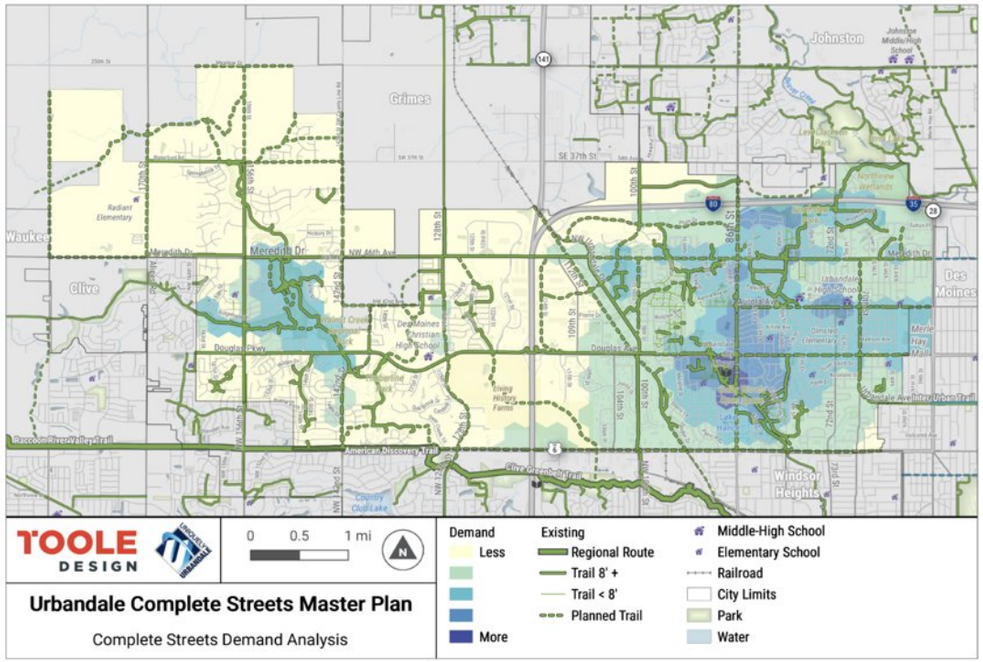
Figure 4.19 Annual Average Daily Traffic in Urbandale



Source: Iowa Traffic Data, 2024.

Figure 4.20 shows the complete street demand analysis. One can visualize the paths that have been constructed and those that have yet to be developed in the city, as well as areas of high and low demand. High demand for connectivity is shown in darker blue and is seen in both the western and eastern sides of Urbandale. The city should prioritize trail implementation in high-demand areas to meet residential needs. Urbandale should continue to support the *Compete Streets Master Plan* by implementing these actions and comparing trail progress to the existing map.

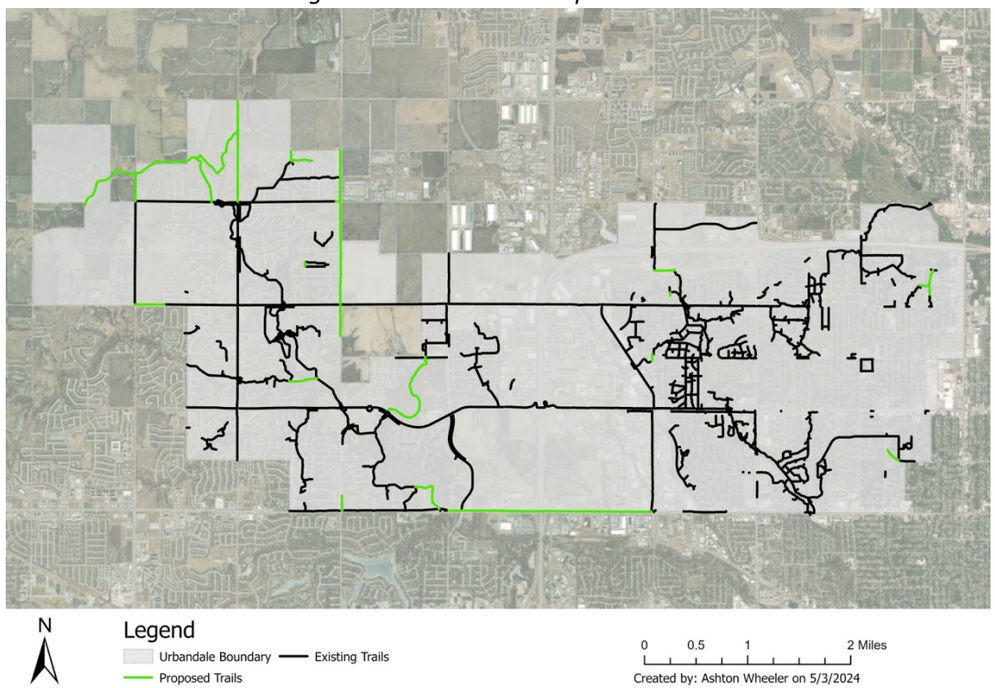
Figure 4.20 Complete Streets Demand Analysis



Source: Urbandale Complete Streets Master Plan, 2019.

Figure 4.21 continues the visualization of trail networks throughout Urbandale. This map highlights the existing and proposed trail networks alone to deepen the understanding of Urbandale's current path connectivity and future development opportunities. Urbandale can further support sustainable modes of transportation by enhancing the existing trail system and continuing to construct safe trails and roads. This will encourage walking and biking throughout the city and ensure residential safety and well-being on trails that residents enjoy using for park access, nature connection, and transportation.

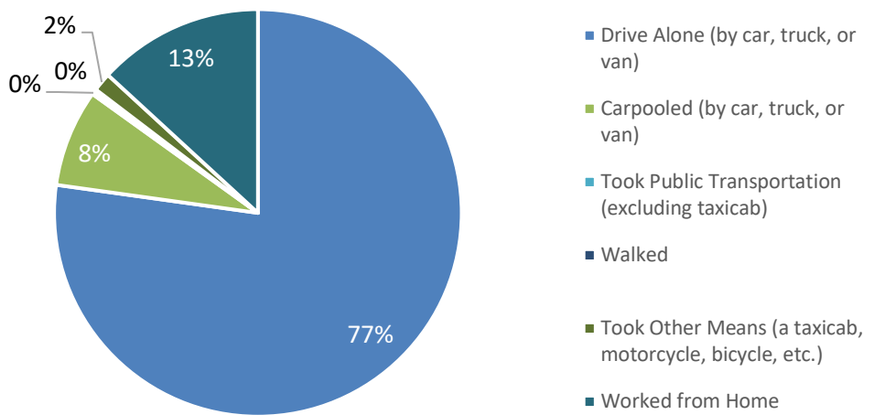
Figure 4.21 Urbandale Proposed Trails



Source: City of Urbandale, 2019.

Figure 4.22 illustrates the various modes of transportation residents in Urbandale use to get to work in 2022. The option to work from home is increasing for many industries; however, plenty of residents are still required to commute. Many residents in Urbandale rely on personal vehicles, at 77%, increasing auto density and causing more traffic in the community. Roughly zero percent of residents walk or use public transit to get to work every day.

Figure 4.22 Modes of Transportation in 2022



Source: 5-Year Estimate 2022 ACS, U.S. Census Bureau.

ACTIONS FOR GOAL H

Action H1: Upgrade wayfinding signage along paths and roadways (short-term, adaptation).

An action that includes wayfinding enhances the experience of navigating Urbandale's trails. Effective wayfinding ensures safety and reduces confusion. Wayfinding signs can be placed along trails to indicate the direction travelers should go to reach their desired destination. Signs can also include the length of paths and which roadways they will connect to. An increase in good, clear signage throughout the city will provide a better atmosphere while walking.

Potential Partners: Iowa Department of Transportation (DOT) and Dallas & Polk County.

Funding: Iowa DOT and Iowa Sign Replacement Program (ISRP).

Community Engagement: Urbandale will provide community feedback opportunities, including online surveys and public meetings. This addresses community concerns over wayfinding deficiencies, such as the lack of signage and sign quality during the implementation process.

Equity & Justice: The city should engage with culturally diverse citizens, specifically non-English speaking residents, to ensure signage is inclusive to all residents. It is important that citizens from diverse backgrounds can easily understand and navigate wayfinding signage throughout the community in their preferred language.

Monitoring Success of Action H1:
Quantitative Metrics: 1) Document changes in the quality of wayfinding signs from the start of the year to the end to assess damages from weather and season changes. 2) Track the wayfinding signs conditions after major weather events or damage. 3) Document and report annually to the community the percentage of change in the quality of signage. 4) Conduct a community survey on the clarity of signage on trails and pathways. 5) Number of wayfinding signs that were replaced.

Qualitative Metrics: 1) Create drop boxes near public signs for community feedback to improve the quality of wayfinding. 2) Feedback from residents on the quality and comprehensiveness of signage within the community.

Action H2: Enhance pathway infrastructure by repairing uneven surfaces and removing debris (short-term, mitigation).

An action to repair pathways allows residents of all abilities to walk safely along Urbandale's trails. Cracked concrete causes gaps and uneven surfaces, creating hazards for walkers and bicyclists. Paths in and around natural areas often have debris that obstructs smooth trail use, such as fallen tree branches. Urbandale should analyze wooded trailways and conduct regular progress reports of debris clearing. The city should prioritize maintaining current and future pathways to preserve trail infrastructure and ensure safety and accessibility.

Potential Partners: Iowa DOT.

Funding: Federal Highway Administration and Sidewalk Millage Tax (SMT).

Community Engagement: Urbandale can utilize the region's active communities and a multitude of organizations seeking to engage with one another. First, the Parks and Recreation Department plays a pivotal role in fostering these connections by organizing various community events such as the Earth Day Clean Park Clean Up. The city will also engage with local bike and walk groups to hold trail-clearing events where residents can help assess trailway conditions and clear debris along pathways.

Equity & Justice: By reducing trailway barriers, residents with restricted mobility are ensured comfort and safety while using the city's trail infrastructure. Urbandale should partner with local non-profits and disability awareness groups to assess trailway accessibility.

Monitoring Success of Action H2:
Quantitative Metrics: 1) Track percent change in damages and cracks of paved pathways in the spring after temperature changes affect the ground. 2) Measure the length of pathways that were repaired.

Qualitative Metrics: Perception of pathway users on the success of infrastructure improvements.

Action H3: Improve pedestrian safety by providing lighting along walkways (mid-term, adaptation/mitigation).

This action involves installing sufficient light fixtures along dark or poorly lit corridors that will illuminate streets and pathways. This will improve safety for pedestrians traveling along the path and for drivers if the path crosses or is along the roadway.

Potential Partners: Des Moines Area Metropolitan Planning Organization (MPO).

Funding: U.S. Department of Transportation, Safe Streets, and Roads for All Program (SS4A).

Case Study: The City of Ann Arbor, Michigan has a voter-approved sidewalk millage tax. This tax generates $560,000 or more for sidewalk repairs and replacements yearly. Sidewalk maintenance was a severe issue for the city, and this tax was created to address sidewalks that were not adequately repaired through the city's code requirements. It assigns the responsibility of sidewalk maintenance to the adjacent property owner. "The special millage was seen as a more equitable and effective means to address the city's sidewalk maintenance needs and was approved by over 60% of voters. As a result of the 0.125-mill, the average household pays an additional $13 per year in local taxes" (7 Funding, n.d.). An exemplary sidewalk is shown in Figure 4.23, with even pavement and sufficient lighting.
Source: 7 Funding, n.d.

Figure 4.23 Safe Streetscape

Community Engagement: Urbandale will host a live music event in the downtown or a public park at night to showcase enhanced lighting. During these events the city will conduct walkway assessments to gather resident feedback on pathway conditions, safety concerns, and areas needing improvement.

Equity & Justice: Equity can be enhanced by accommodating socially vulnerable communities by providing safe and adequate lighting fixtures along walkways. This will serve as a deterrent to crime and reduce the likelihood of theft, vandalism, and assault along walkways.

Monitoring Success of Action H3:
Quantitative Metrics: 1) Track what kinds of lights are being used and the number of new streetlights. 2) Record the percent change in the quantity and quality of lighting along walkways.

Qualitative Metrics: 1) Hold annual public meetings to assess safety along walkways, trailways, and pathways. 2) Following the installation of enhanced lighting, compare pre- and post-implementation feedback regarding pedestrian perceptions of safety and security.

Action H4: Implement bike- and pedestrian-focused projects in high-demand areas identified in the *Complete Streets Master Plan* (long-term, adaptation/mitigation).

This action works in conjunction with Urbandale's *Complete Streets Master Plan*. Referencing Figure 4.19, Urbandale identifies areas of high demand throughout the city. These areas will be prioritized for the implementation and expansion of Urbandale's trail systems. To alleviate stress, Urbandale should prioritize looking at speed limits in and around high pedestrian zones, like schools, to ensure residents and children are safe to walk around the community. The city should look at traffic lights and ensure that they provide enough time for all residents to use the crosswalks, especially along larger roadways.

Potential Partners: Iowa DOT.

Funding: Des Moines MPO, Surface Transportation Block Grant Program Set-aside (TAP).

Case Study: The City of Fort Collins, Colorado succeeded a long-term vision to improve their bikeway networks. They aimed to develop an extensive and connected network of trails and bicycle facilities through the city and achieved a Platinum-level Bicycle Friendly Community (BFC) award from the League of American Bicycles. The city and the League focus on enhancing residential quality of life by promoting safe, accessible, and sustainable transportation. Fort Collins committed to specific infrastructure improvements, such as protected pathways and bicycle lanes, crosswalk and intersection improvements, wayfinding, and trail connectivity enhancement, shown in Figure 4.24. The BFC designation must be applied for, and the city must align with required actions to achieve this status.
Source: City of Fort Collins, n.d.

Figure 4.24 Platinum-Level BFC Network

Community Engagement: Urbandale should conduct regular updates and progress reports to keep residents informed on the progress of the project implementation. Results can be posted on social media platforms, discussed at City Council meetings, and updated in the *Complete Streets Master Plan*.

Equity & Justice: Urbandale should prioritize implementing trails in areas where socially vulnerable communities heavily depend on pathways to access public amenities, such as parks and community centers. This ensures convenient commuting and facilitates access to essential destinations.

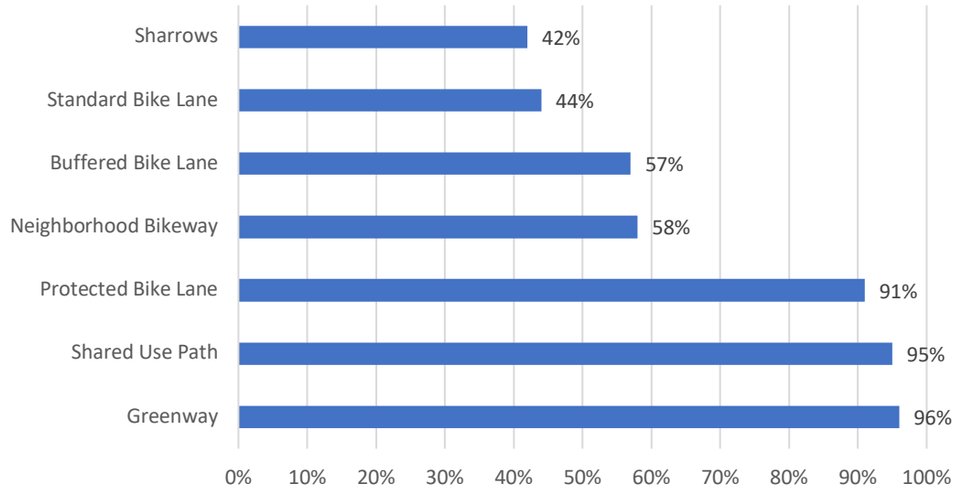
Monitoring Success of Action H4:
Quantitative Metrics: 1) Track the current, and newly, implemented projects to compare improvements to the *Complete Streets Master Plan*. 2) Record the progression of the length completed/how much is left. 3) Record the number of new pathways in high-demand areas. 4) Conduct a community survey in high-demand areas to record where residents would like to locate potential pathway routes.

Qualitative Metrics: 1) Observe behavioral changes in residents of high-demand areas on how often they bike and walk post-enhancement of bikeways through focus groups. 2) Engage in interviews with residents on their perception of bikeway safety and accessibility.

Action H5: Prioritize trail construction based on respondents' "very comfortable" ratings (long-term, adaptation/mitigation).

This action coordinates with the *Complete Streets Master Plan* to identify various bicycle facilities in the community, as seen in Figure 4.25. Urbandale will prioritize implementing greenways, shared-use pathways, and protected bike lines that the community voted as modes of transportation they felt "very comfortable" using (Complete Streets, 2019, p. 21). There is strong support for protected bike lanes and demand for pedestrian infrastructure on major streets, particularly in the eastern area. The city can leverage community support to further regional connectivity and livability in high-traffic areas.

Figure 4.25 Percentage of Respondents who Rated Each Bicycle Facility as "Very Comfortable" or "Somewhat Comfortable"



Source: Complete Streets Master Plan, 2019.

Potential Partners: Iowa DOT.

Funding: Des Moines MPO, Surface Transportation Block Grant Program Set-aside (TAP).

Case Study: Minneapolis, Minnesota created the Midtown Greenway located on an old railway line, shown in Figure 4.26. The 5.5-mile-long corridor passes over and under a major city streetway, avoiding hazardous traffic completely. The Greenway extends to the western suburbs of Minneapolis and connects with other trails and paths along the Mississippi River. These trails provide opportunity for community connection and economic growth, as they run along various commercial strips, retailers, restaurants, and local businesses. The trail is plowed, lit, and accessible all winter, and maintained by the Midtown Greenway Coalition. The Coalition is a grassroots organization that continues to engage and excite the community for recreational activities.

Figure 4.26 Midtown Greenway

Source: Midtown Greenway Coalition, n.d.

Community Engagement: Foster relationships with local businesses by providing volunteering opportunities during trail construction to promote bike and pedestrian-friendly infrastructure.

Equity & Justice: Using survey results from the *Complete Streets Master Plan,* the city should identify the top three trails rated most comfortable by the community. Then, Urbandale will construct pathways and trail system infrastructure that enable all residents to feel comfortable and safe utilizing the trail. The selected type of pathway will be implemented in socially vulnerable areas first to ensure equitable access and support for those communities.

Monitoring Success of Action H5:
Quantitative Metrics: 1) Track the number of current and new types of trail facilities built throughout the community. 2) Conduct annual surveys to understand how comfortable residents feel along different types of trailways to understand possible shifts in the community's comfortability.

Qualitative Metrics: Organize regular focus groups and City Hall meetings for citizens to address comfortability, safety, ease of navigation, trail design, and overall satisfaction with trail facilities.

FOOD ACCESS GOAL I

Goal I: Improve access to nutritious, affordable, and culturally desirable food for all.

The Big Picture: In Urbandale, some residents have limited walking access to fresh and healthy food, making it challenging to meet their dietary needs (based on the spatial analysis displayed in Figure 4.29). Throughout the city, there are limited options for diverse, cultural food markets. Ensuring that diverse and nutritious food resources are available to all residents throughout Urbandale can help combat food insecurity and address residents' daily needs. Supporting local food production enhances environmental sustainability and reduces emissions by minimizing transportation, as food is sourced and purchased within Urbandale or in nearby areas.

UN Sustainable Development Goal(s):

Sustainable Development Code(s): Infill Development

Co-Benefits: Future prosperity and community development

City Assets: Urbandale can prioritize access to nutritious, affordable, and culturally desirable food by encouraging accessible community gardens for all. By selecting a public school in the city, Urbandale can support local food production and set an example for the city's youth with healthy activities. Additionally, these educational gardens can be opened to the public to rent a plot, further expanding food access within the community. The city can also select land that belongs to the public sector to create a community garden. Urbandale can use city-owned spaces to ensure all residents can meet their dietary needs and preferences.

Connection to Existing Plans: In Urbandale's *Comprehensive Plan*, the city highlights multiple strategies that increase access to food. The plan identifies mixed land-use approaches, such as local commercial establishments, market spaces, and food infrastructure; these have all been cited as methods to connect citizens to nearby food resources. The primary target for food-aimed development is in western Urbandale where the most opportunity to expand food resources lies. There are opportunities to expand on these actions by including informal food options from east to west Urbandale. Incorporating market spaces, food infrastructure, community gardens, and farmers' markets throughout Urbandale will enhance citizens' access to nutritious and culturally diverse food options.

A great opportunity for engaging the community with healthy and nutritious food resources is the large unutilized space on the southwest corner of Douglas Ave and 86th Street, currently owned by Urbandale. By implementing the proposed pedestrian plaza outlined in the *East Focus Area Plan*, Urbandale could transform this area into a local food hotspot for the community. This location would be a perfect place to hold farmer's markets, community gardens, and gardening workshops. By repurposing this unused area in a well-trafficked pedestrian space, Urbandale can create a lively hub for healthy living and communal connectivity.

Learning from Data

During the focus group event, participants expressed a strong desire for increased food options and improved access to grocery stores. Accessing food in and around Urbandale is currently inconvenient and unsafe to walk or bike to. Focus group participants would like to see an increase in close and walkable grocery stores.

You have to drive into Urbandale, Johnston, Des Moines. It is like 10-minute drive to any food shops.

It is hard to go to other places to buy food by walking because there is no footpath.

A notable concern was the absence of an Asian market in Urbandale. Currently, the nearest Asian market is in Des Moines. This is inconvenient for the local refugees and immigrants that participated and particularly challenging to access for those who do not have a driver's license or personal vehicle. To alleviate this, Urbandale should prioritize establishing grocery stores and enhancing connectivity to food resources across the region.

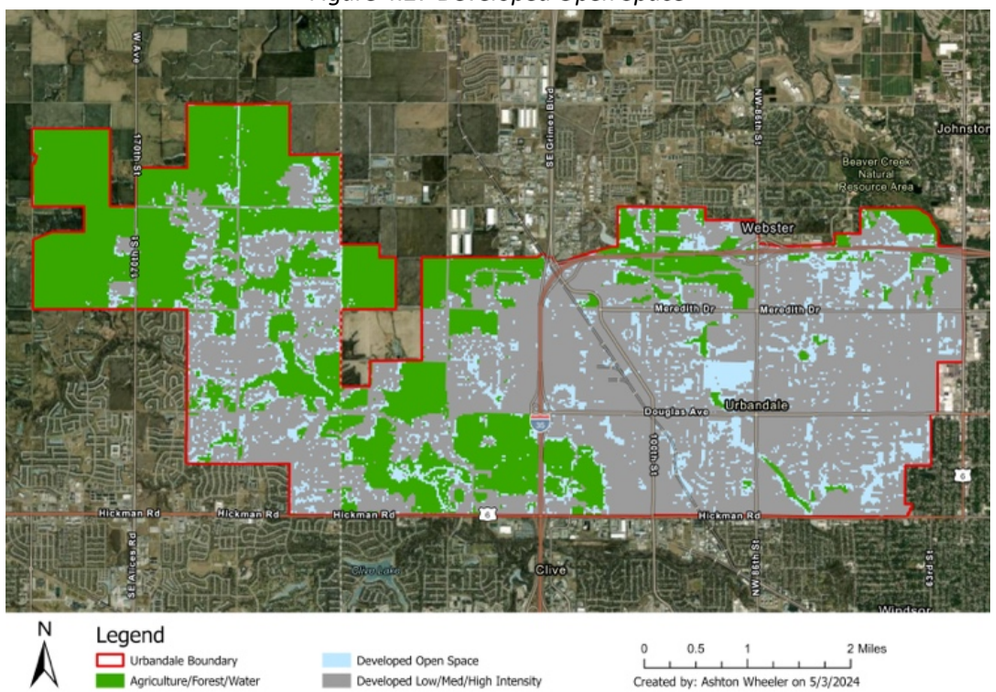
When they want to buy Asian food, they have to go to Des Moines. They wish that there was an Asian market in Urbandale area.

Focus group participants also noted the price of the grocery stores they currently go to. Residents are seeking more superstores that offer all necessary items at lower prices.

We wish there was another Walmart or Sam's Club because of the good prices.

The map in Figure 4.27 is intended to promote the possible open spaces within Urbandale's urban areas for community garden projects. The areas of developed open space are identified in light blue and are predominately found on the eastern side of the city. Not all locations are guaranteed to be utilized for community gardens, but they present potential opportunities for installation if the city's zoning codes and regulations permit it. Community gardens allow for public gatherings and relationship building with a healthy, outdoor hobby. It enhances inclusivity by providing culturally diverse populations with a place to grow their native produce. The benefits of these community gardens are needed in Urbandale to enhance social cohesion, nutrition, and physical activity throughout the area.

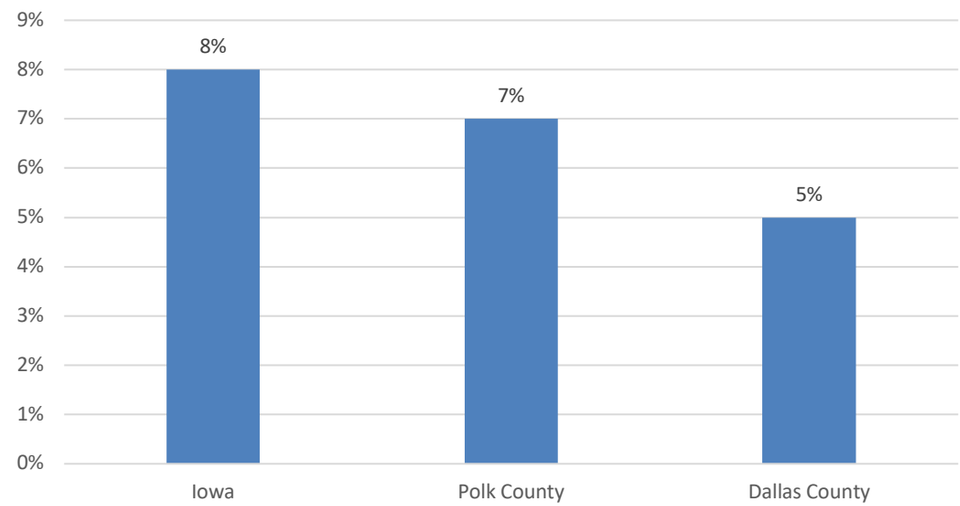
Figure 4.27 Developed Open Space



Source: USDA Crop Scape

Figure 4.28 shows the food insecurity rates for the state of Iowa, Polk County, and Dallas County. Food insecurity rates combine various socioeconomic variables to gauge how well the community can meet its daily needs. The food insecurity rate is higher for individuals and children in Polk County than those in Dallas County. This shows that food is more expensive for residents within Polk County than Dallas County, making low-income residents more likely to be food insecure in Polk County.

Figure 4.28 Food Insecurity Rate Averages



Source: Feeding America

ACTIONS FOR GOAL I

Action I1: Conduct a site suitability analysis for potential new community gardens (short-term, adaptation/mitigation).

For this action, a site suitability analysis will be created using extensive community engagement, including NGOs from refugees and socially vulnerable residents. The analysis will have parameters ranking areas that are 'non-suitable' to 'very suitable' to implement community gardens. The ranking will account for the soil contents, the existing development, and the distance to necessary infrastructure, like water sources. This suitability assessment will also support the implementation of Action I2.

Urbandale can access the Polk County Master Gardner Demonstration Garden that resides in Urbandale. The City of Urbandale can convert or transform part of the demonstration garden to show an example of what a community garden can consist of. Urbandale can provide an opportunity for residents and stakeholders who utilize this partnership to invite the community to adopt local agricultural practices and learn from the demonstration garden examples.

Potential Partners: Local churches, Urbandale Community Action Network, Polk County Master Gardeners.

Funding: USDA Urban Agriculture and Innovative Production Grants (UAIP).

Community Engagement: Urbandale will allow residents to identify potential sites, through surveys, on where they would like the gardens to be placed.

Equity & Justice: Within the site suitability analysis, the city will assign high suitability scores to locations that address the needs of refugees and socially vulnerable residents, including those in underserved neighborhoods that have less access to food resources.

Monitoring Success of Action I1:
Quantitative Metrics: 1) Record variable changes every five years in the site suitability analysis to ensure the implementation of new community gardens is in impactful areas. 2) Record community survey metrics and implement them within site suitability analysis. 3) Track the number of new community gardens in the city based on the site suitability analysis.

Qualitative Metrics: 1) Conduct several focus groups with refugees and socially vulnerable residents to determine what experiences, challenges, and benefits they face, as well as any suggestions for improvement to existing gardens. 2) Conduct City Hall meetings to engage residents, allowing them to share their preferences on site suitability.

Action I2: Establish community gardens in vacant lots and public spaces (mid-term, mitigation).

Using the suitability assessment from Action I1, the city will have a better understanding of what locations are most suitable for the development of a community garden. This action intends to establish sites that are very suitable for community gardens as well as replace underutilized open spaces, like parking lots or vacant spaces that may be present in urban areas.

Potential Partners: Iowa Foundation for Agricultural Advancement.

Funding: USDA Urban Agriculture and Innovative Production Grants (UAIP).

Case Study: Cleveland, Ohio established the Ohio City Farm, which is one of the largest urban farms in the United States, shown in Figure 4.29. This plot is nearly six acres and provides fresh, local, and healthy food to Cleveland's underserved residents. This farm has boosted the local food economy and continuously educates the community about the importance of a complete food system. The farm is jointly administered by Ohio City Incorporated, the Cuyahoga Metropolitan Housing Authority, and operated by the tenants who work the land. It empowers refugees to become self-sufficient in their new community and provides a familiar and welcoming environment to the city.
Source: Ohio City Farm, n.d.

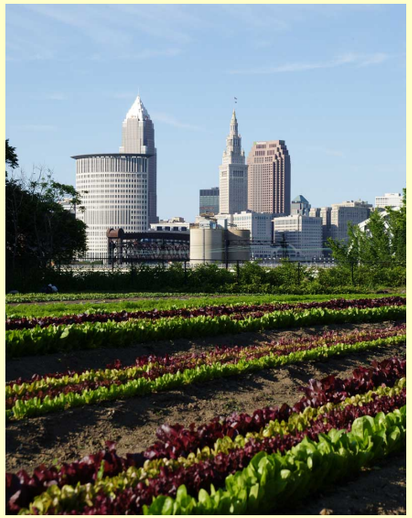


Figure 4.29 Ohio City Farm

Community Engagement: The city will communicate with residents through public meetings and outreach events to collectively identify suitable vacant lots and public spaces for establishing community gardens.

Equity & Justice: New community garden spots will be placed in known areas where food insecurity disproportionately burdens residents. Specific parcels of the garden will be reserved for socially vulnerable residents to ensure they have a place to grow their produce.

Monitoring Success of Action I2:
Quantitative Metrics: 1) Calculate the total square footage that would be needed in the vacant lots and public spaces. 2) Record the longevity and sustainability of the community gardens by monitoring factors such as garden maintenance, renewal of leases or agreements for land use, and ongoing community support. 3) Track the number of vacant lots used for community gardens.

Qualitative Metrics: Conduct focus groups and public discussions on how the new community gardens have impacted social cohesion, neighborhood revitalization, and individual well-being.

Action I3: Implement community gardens in public schools (mid-term, mitigation).

This action will provide students with the opportunity to become involved in the food production process. By implementing community gardens in schools, students will become more educated on what it takes to grow various plants and vegetables. This program can be administered in agricultural, environmental, or other related classes. The school can expand on an existing school program or create a new club/afterschool activity for all students to engage in, regardless of their age and grade. The vegetables grown through this action can be used in school lunches to support clean, local, and healthy eating for all students.

Potential Partners: Urbandale Community School District and Iowa State University.

Funding: Iowa Farm-to-School Program (FSP).

Case Study: Waconia, Minnesota created the Waconia Edible Classroom, located on farmland adjacent to the town's public middle school. It offers a dozen community plots for rent and is used as an outdoor hands-on learning space for students to see a seed-to-table process. Through this program, students start growing seeds in the spring and transplant them into the garden before school is done for the summer. The school is used during the summer for a childcare program and those children and local volunteers tend to the garden throughout summer, displayed in Figure 4.30.
Source: The Edible Schoolyard Project, n.d.

Figure 4.30 Students Building the Community Garden

Community Engagement: Connect with local school systems and provide online surveys to students to understand how younger generations benefit from agricultural experiences within the classroom. Create cooking and food-based events in schools for children to showcase their produce after harvest.

Equity & Justice: Urbandale's public-school system will provide students with access to hands-on learning opportunities and the necessary resources to cultivate an inclusive understanding of sustainable food production in the classroom.

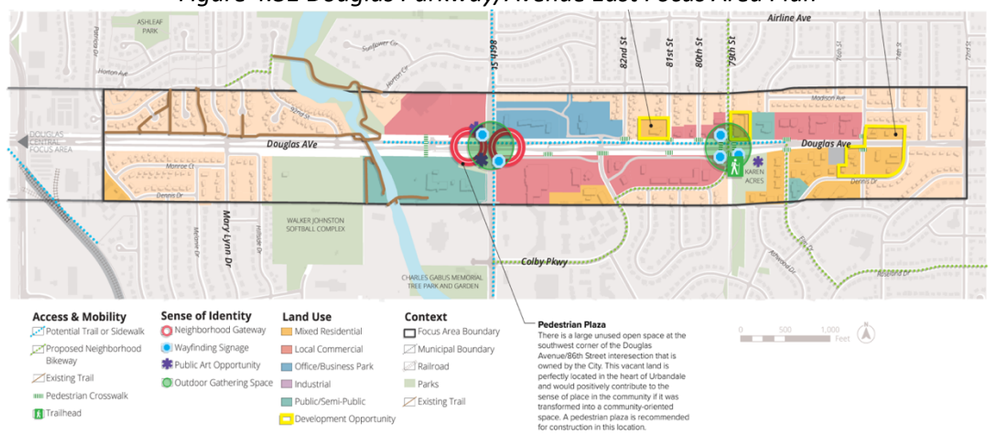
Monitoring Success of Action I3:
Quantitative Metrics: 1) Track the number of students participating in the community garden programs. 2) Monitor student attendance and engagement in agriculture-related activities, such as classes, workshops, field trips, and extracurricular events. 3) Number of schools with community gardens and the number of plots.

Qualitative Metrics: 1) Organize focus groups to facilitate discussions around specific topics such as the educational value of the program and its impact on student engagement. 2) Interview students annually on the success and benefits of the community garden.

Action I4: Create a local farmers' market (short-term, adaptation).

This action identifies the pedestrian plaza, recommended in the *Douglas Avenue East Focus Area Plan,* as a prime location for a farmers' market. Visualized in Figure 4.31, this large, unused, and open space is perfectly situated for community enrichment and can become a pedestrian hotspot. By partnering and taking inspiration from existing farmers' markets in the Greater Des Moines Metropolitan Area, Urbandale can learn from successful farmers' markets.

Figure 4.31 Douglas Parkway/Avenue East Focus Area Plan



Source: Urbandale Comprehensive Plan, 2023.

Potential Partners: Eat Greater Des Moines and Urbandale Lions Club.

Funding: USDA Farmers Market and Local Food Promotion Program (FMPP).

Community Engagement: Urbandale will advertise the farmers' market with social media, newspapers, and pamphlets to encourage community participation in local events.

Equity & Justice: The city will provide a reduced cost for small, local farmers and socially vulnerable residents to purchase a spot at the farmers' market.

Monitoring Success of Action I4:
Quantitative Metrics: 1) Record the number of vendors that would participate in this event. 2) Encourage vendors to count how many individuals participated in sales throughout the event.

Qualitative Metrics: Conduct interviews at local farmers' markets where residents and stakeholders can give feedback on improvements to the community.

Action I5: Develop a program to deliver fresh food and food cooperatives to the community (mid-term, mitigation).

Through this action, a program can be created to help deliver fresh food to various areas of the city. The delivery vehicle will make various stops throughout the week.

Potential Partners: Urbandale Food Pantry and United Way of Central Iowa.

Funding: USDA Urban Agriculture and Innovative Production Grants (UAIP).

Case Study: The City of Chicago, Illinois established the Fresh Moves Mobile Market to bring the benefits of locally grown produce to urban areas. The Mobile Market is a bus that has been converted into a mobile farmer's market, seen in Figure 4.32. The Urban Growers Collective runs the program and seeks to close the gap for food access by providing nutritious food to all residents, specifically those who have been historically divested. *Source: Fresh moves mobile market, n.d.*

Figure 4.32 Fresh Moves Mobile Market

Community Engagement: The city will collaborate with the community and neighborhood advocates to create focus groups that identify drop-off and pick-up points for the fresh food delivery program. Urbandale's delivery system can host bus ride-a-longs for interested residents to encourage volunteers, helping residents' shop and bag groceries.

Equity & Justice: Discounted prices of delivery food services will be available for socially vulnerable families. The city will engage with socially vulnerable communities to offer preferred products and support grocers that meet the needs of families.

Monitoring Success of Action I5:
Quantitative Metrics: 1) Measure the quantity of fresh food distributed through the program over time. 2) Assess the number of residents or households that are reached in the program. 3) Map the percentage of geographic coverage of the program to ensure equitable distribution of fresh food to socially vulnerable areas.

Qualitative Metrics: Conduct focus groups to share stories, challenges, and aspirations regarding their food shopping habits, dietary preferences, and overall well-being.

Action I6: Adopt urban agriculture ordinances that provide a framework for food growing practices (long-term, adaptation/mitigation).

This action supports implementing ordinances that allow for specific agricultural practices to be permitted in urban settings. If the plot of land that will be used to grow crops goes above the set area size, a special use permit must be obtained.

Potential Partners: Polk & Dallas County and Des Moines Area MPO.

Funding: Funding is not required for this action.

Case Study: The City of Cedar Rapids, Iowa established an Urban Agriculture Ordinance that defines the standards for urban agriculture in the city. This ordinance allows for agricultural operations to exist in urban settings by setting requirements that ensure compatibility with adjacent land uses and that farming is done properly. After obtaining the appropriate permits, the city encourages the use of urban agriculture. A farm in Cedar Rapids is shown in Figure 4.33. Recently, the ordinance was expanded to allow for community gardens on private property within the property owner's permission.
Source: Ordinance No. 027-14., 2014.

Figure 4.33 Urban Farm

Community Engagement: This action provides agriculture learning opportunities to the community that consists of public city meetings to educate citizens on how agricultural ordinances enable local food production. Urbandale will also leverage the network of residents and stakeholders with events like Party in the Park to further establish community gardens.

Equity & Justice: The city will inspect the proposed growing area and ensure that citizens are growing their produce safely adjacent to other properties. Once the necessary requirements are completed, residents will be given discounts for the materials that may be needed to meet the code.

Monitoring Success of Action I6:
Quantitative Metrics: 1) Measure the total area of land that is allocated or designated for urban agriculture purposes within the jurisdiction covered by the ordinances. 2) Develop a survey to explore stakeholders' perceptions, attitudes, and experiences related to urban agriculture ordinances. 3) Track the percentage increase of residents in the city who have an agricultural plot.

LAND USE DEVELOPMENT GOAL J

Goal J: Promote land-use development patterns to improve the utilization of assets in the built environment.

The Big Picture: The City of Urbandale has a vehicle-centric layout that contributes to carbon emissions and a lack of pedestrian mobility. To address these challenges, the goal of land-use development is to promote affordable and mixed-use housing developments with transit-oriented mobility. By encouraging housing developments that support public transportation, Urbandale aims to reduce GHG emissions and improve connectivity within the community. Implementing this goal will lead to more efficient use of resources and built environment assets, fostering a sustainable and vibrant urban environment for residents.

UN Sustainable Development Goal(s):

Sustainable Development Code(s): Infill development

Co-Benefits: Community development, connectivity enhancements, livability refinement

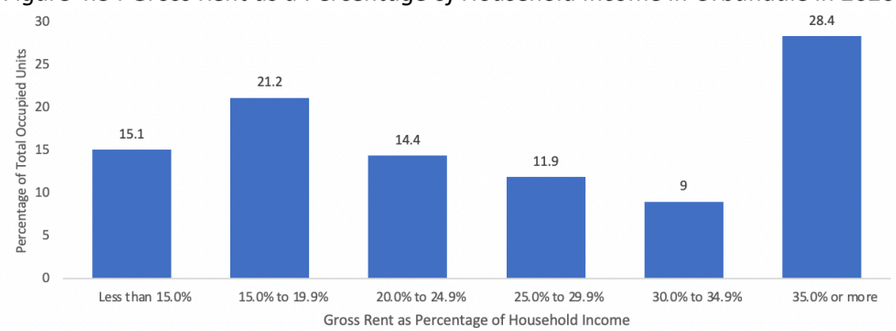
City Assets: Urbandale can set an example and allow the implementation of efficient land use development to be easier and more beneficial to future developers. Increasing the number of mixed-use zoning districts in future land use plans and revising parking minimum zoning requirements is something that the city can quickly implement. Urbandale has multiple city-owned parking lots. Decreasing the size of these lots and adding in green spaces or incorporating other uses will set an example. This will demonstrate Urbandale's desire to move towards a more transit-oriented community.

Connection to Existing Plans: The actions associated with Goal J align with the overarching vision and themes of the *Forward Urbandale Comprehensive Plan.* This includes the creation of livable, sustainable communities through innovative planning and design. By encouraging diverse housing options, the plan ensures that the city's growing population has access to affordable and varied living arrangements. Enhancing transportation connectivity and accessibility is another key focus, aimed at improving mobility and reducing traffic congestion. Furthermore, the comprehensive plan emphasizes economic development and vitality, fostering a robust and resilient local economy that supports businesses and creates jobs. Collectively, these initiatives not only advance the efficient use of land and resources but also contribute to a higher quality of life for all Urbandale residents.

Learning from Data

The examination of housing data is an important topic for land use development. Data for gross rent as a percentage of household income (GRAPI) in Urbandale shows what percentage of residents are considered rent burdened. Figure 4.34 illustrates that a significant portion of residents are facing rent burdens, with over one-third of households spending 30% or more of their income on rent. The disparity between the lowest and highest GRAPI categories shows a shortage of affordable housing in Urbandale.

Figure 4.34 Gross Rent as a Percentage of Household Income in Urbandale in 2020



Source: 5-Year Estimate 2020 ACS, U.S. Census Bureau

Vehicle Miles Traveled (VMT) is a useful metric in sustainable land use planning because it quantifies the amount of travel by vehicles within a region. As Table 4.1 shows, a sum of 380,444 vehicle miles traveled across the various road types in Urbandale in 2022. This indicates the total vehicle activity within the city. A lower total city VMT would be correlated with more sustainable practices since it directly impacts GHG emissions and energy consumption. Understanding VMT allows the city to develop strategies to reduce reliance on personal vehicles, promote public transit, and create more walkable communities, leading to reduced environmental impact and enhanced quality of life.

Table 4.1 Traffic Volume of Urbandale in 2022

City	Municipal Interstate	Municipal Primary	Municipal	Total City VMT
Urbandale	205,893	3,248	171,303	380,444

Source: Iowa Department of Transportation, 2022

Noting the total number of affordable housing units allows for a better understanding of the availability of housing opportunities for lower-income and rent-burdened families. Knowing the location and total availability of affordable housing units in Urbandale gives planners an idea of where housing diversity could be increased in future construction. Table 4.2 illustrates the projects that contain affordable housing units and how many of them are available for low-income residents. With a population greater than 46,000 residents and few low-income housing units available, this demonstrates a need for more affordable housing units.

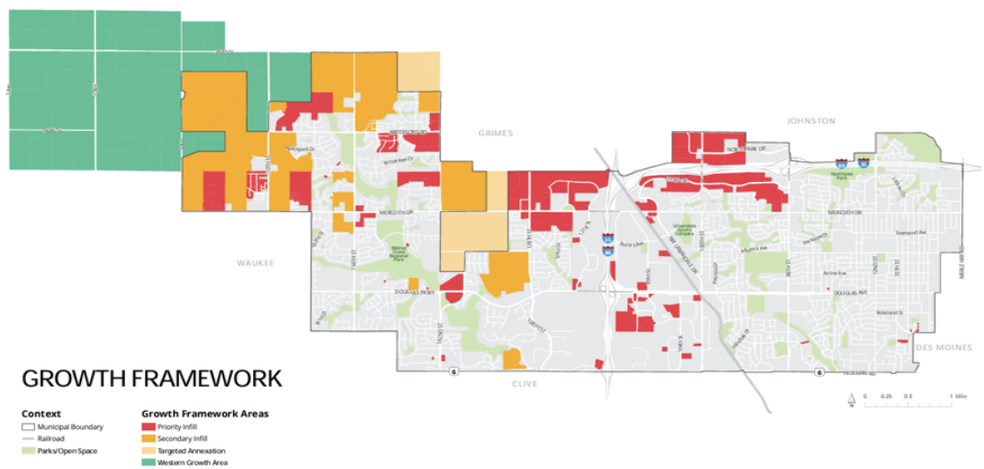
Table 4.2 Number of Affordable Housing Units in Urbandale in 2022

Project Name	Project Address	Total Number of Units	Total Low-Income Units
Cross Creek Apartments of Urbandale	8714 Meredith Dr.	120	118
Merle Hay Apartments (Lillis Lofts)	6313 Douglas Ave	43	38

Source: LIHTC Database, 2022

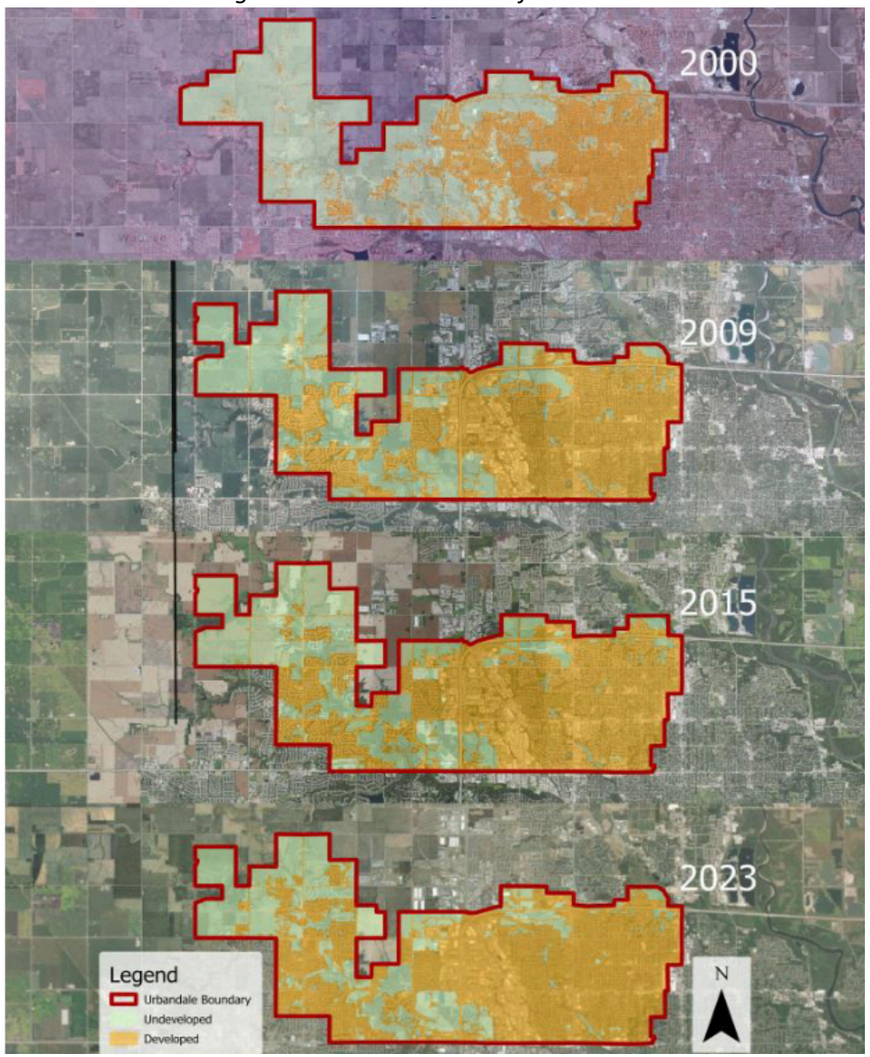
Knowing where infill lots are located is crucial to sustainable land use planning because it allows for the optimization of existing urban spaces. This reduces the need for expanding into undeveloped areas. Utilizing these spaces efficiently supports the revitalization of urban areas, promotes the use of existing infrastructure, and contributes to a reduction in environmental impact by minimizing the extension of utilities and roads. Figure 4.35 shows where the priority infill development areas are, most of which are in the western part of the city.

Figure 4.35 Map of Priority Infill Development in Urbandale



Source: Forward Urbandale Comprehensive Plan, 2023

Figure 4.36 Urban Growth of Urbandale



Source: USDA Crop Scape Data Layer, 2023

Understanding the urban growth of Urbandale from 2000 to 2023 is crucial for sustainability planning. Figure 4.36 and Table 4.3 both show the growth of Urbandale. The city has been developing westward, but there are still opportunities to continue development on the west side of the city limits. Table 4.3 lays out the data in chart form of what is being seen in Figure 4.36. Both provide insight into patterns of development, expansion, and densification, which are key to making informed decisions for future growth. This data helps in anticipating infrastructure needs, managing resources efficiently, and mitigating environmental impacts. Moreover, it supports the creation of policies that promote sustainable urban living, ensuring that growth is managed in a way that balances economic development with environmental stewardship and social equity.

Table 4.3 Urban Growth Data of Urbandale

Year	Change in Urbanized Area in Relation to 2000	Population Density (pop/km2)	Housing Unit Density (hu/km2)
2000	NA	1,357	554
2009	64%	1,123	465
2015	69%	1,165	483
2023	83%	1,161	457

Source: USDA Crop Scape Data Layer, 2023

ACTIONS FOR GOAL J

Action J1: Develop mixed-use zoning regulations with incentives for integrating residential, commercial, and recreational spaces within walkable areas (long-term, adaptation).

Initiate zoning regulations that promote mixed-used developments and incorporate local businesses with new housing. Increased diversity of land use in Urbandale will bolster walkability between housing, recreation, and commerce, and increase the general social connectivity. Overall, mixed-use zoning regulations will increase efficient uses of land,

walkability, sustainable development, flexibility and adaptability, and economic activity. All of those benefits will be noticeable from the community.

Potential Partners: Iowa Economic Development Authority and The Pappajohn Entrepreneurial Center.

Funding: Workforce Housing Tax Incentive Program (WHTIP), Brownfield and Grayfield Redevelopment Tax Credits, Smart Growth Grants, Tax Increment Financing (TIF) Districts.

Case Study: Overland Park, a suburb of Kansas City, implemented a mixed-use development plan in its downtown area, known as the "Vision Metcalf" project. The plan aims to rejuvenate Overland Park's northern Metcalf Avenue by integrating modern planning principles. One key strategy is developing mixed-use zoning regulations with incentives, encouraging residential, commercial, and recreational spaces in walkable areas, envisioned in Figure 4.37. This approach enhances urban vibrancy, economic viability, and community appeal, aligning with the plan's goal to create a dynamic and cohesive environment for residents, businesses, and visitors alike.
Source: Vision Metcalf, n.d.

Figure 4.37 Vision Metcalf

Community Engagement: City zoning changes and amendments go through the Planning and Zoning (P&Z) Commission before being approved by the Urbandale City Council. These meetings are open to the public and allow residents to be well informed on the development of mixed-use zoning regulations while also providing an opportunity for residents to speak during their meetings and provide feedback to both the P&Z Commission and the City Council.

Equity & Justice: Local NGOs will be invited to meetings and discussions regarding zoning changes in order to ensure that non-English speaking residents are able to understand and participate in the process. Incentivizing mixed-use development also furthers socio-economic diversity and reduces disparities in resource access.

Monitoring Success of Action J1:
Quantitative Metrics: 1) Ratio of residential density & recreational density compared to commercial business density. 2) Total number of tax credits allocated to mixed-use developments. 3) The walkability index value for pedestrian connectivity by measuring the quality of pedestrian amenities and connectivity within a specific area.

Qualitative Metrics: City Council and resident feedback gathered through social media and public meetings on the availability of local commerce and its pedestrian connectivity.

Action J2: Create transit-oriented development zones around public transportation (long-term, adaptation).

Transit-Oriented Development (TOD) zones are areas designed to maximize accessibility and promote sustainable growth. They do this by leveraging public transportation infrastructure as a focal point for urban planning and development. Some key characteristics and strategies of TOD zones include proximity to public transportation, mixed-use developments, compact developments, pedestrian and bicycle infrastructure, and transit supportive policies. Areas in the City of Urbandale that are near DART routes and stops should have higher priority in development to support the idea of TOD zones.

Potential Partners: Toole Design and Complete Streets Committee.

Funding: Safe Streets and Roads for All (SSRA) Grant Program, Public Transit Infrastructure Grant Program, Community Development Block Grants (CDBG).

Case Study: Bellevue, a suburb of Seattle, has adopted a "Grand Connection" plan that emphasizes transit-oriented and pedestrian-friendly infrastructure to create a vibrant, connected, and sustainable city center, shown in Figure 4.38. The plan focuses on transit-oriented development, expanding light rail and bus rapid transit systems. The program aims to enhance pedestrian connectivity by improving routes from Meydenbauer Bay Park through downtown to Eastrail. It includes creating transit-oriented development zones around public transportation. These efforts have contributed to Bellevue's growing reputation as a model for sustainable suburban development.

Figure 4.38 Grand Connection

Source: Grand Connection, 2024.

Community Engagement: Outreach efforts will engage residents in creating TOD zones. This will include public meetings, surveys, and workshops to solicit input on the design and implementation of these zones, fostering community ownership of the development process.

Equity & Justice: Prioritize development around transit hubs to improve mobility options for all residents, particularly those without private vehicles. DART transportation already provides affordable public transportation, and focusing development with them in mind will ensure access to essential services and employment opportunities for all Urbandale individuals.

Monitoring Success of Action J2:
Quantitative Metrics: 1) The walkability index value for pedestrian connectivity by measuring the quality of pedestrian amenities and connectivity within a specific area. 2) Change in annual ridership of public transit. 3) Change in the total number of public transit lines and stops. 4) Circumference of connectivity via public transit and the number of additional routes. 5) Change in the percentage of Urbandale population <0.25 miles from public transit.

Qualitative Metrics: Community feedback, through public surveys and city social media, on pedestrian access and safety.

Action J3: Prioritize the removal of parking minimums for other uses (long-term, adaptation).

Revise zoning regulations to reduce or eliminate requirements for developers to provide a minimum number of parking spaces when constructing new buildings or developments. Instead, the land and resources can be used for other uses, like affordable housing projects and/or green spaces.

Potential Partners: Iowa DOT, Parking Reform Network, Multi-Family Housing Developers.

Funding: Revenue from a Parking-User Tax and Community Development Block Grants (CDBGs).

Community Engagement: Urbandale will engage with residents to ensure that the redevelopment of underutilized parking lots meets the needs of socially vulnerable communities. Educational workshops and seminars can be organized to inform and gather input from residents, business owners, and other stakeholders on the advantages of removing parking minimums and exploring alternative uses for the space.

Equity & Justice: Ensure that the planning process includes input from a diverse range of community members, including low-income residents, people with disabilities, and other marginalized groups who may be disproportionately affected by parking policies. Also, develop policies that incentivize the inclusion of affordable housing in mixed-use developments, ensuring that changes in parking requirements do not negatively impact the availability of affordable housing.

Monitoring Success of Action J3:
Quantitative Metrics: 1) The change in ratio of parking spots to total Urbandale residents. 2) Comparison of the percentage of trips by transportation type. 3) Changes in the ratio of housing density to parking spots. 4) Average trip length in time.

Qualitative Metrics: 1) Community feedback, via surveys, on accessibility to local businesses. 2) Community feedback, via surveys, on transportation safety.

Action J4: Offer density bonuses for developers who incorporate affordable housing units into their projects (short-term, adaptation).

Density bonuses are incentives offered to developers that grant additional building density or floor area ratio allowances in exchange for including a specified percentage of affordable housing units in their projects. It will allow developers to build more units on a given piece of land, increasing the housing supply in the area.

Potential Partners: Affordable Housing Developers.

Case Study: San Francisco, CA, did away with parking minimums in 2019. San Francisco has long been a model city for successful parking reform. With only 3% of space in the central city dedicated to parking, it is one of the least parking centric cities in the United States, one example in Figure 4.39. This has also allowed San Francisco to be among the highest ranks of walkable, bikeable, and transit-friendly places in the US, painting a picture of a future in which policies center people over cars. Rethinking parking frameworks has proven to help reach broader transport, housing, and sustainability goals. The removal of parking requirements aims to combat rising costs for construction and housing development.
Source: In these US cities, 2024.

Figure 4.39 Parklet in San Francisco

Funding: Low-Income Housing Tax Credits (LIHTC) and Public-Private Partnerships (PPPs).

Community Engagement: Community engagement efforts will also focus on discussions and consultations with stakeholders to explore opportunities for offering density bonuses for developers who incorporate affordable housing units into their projects. This will involve engaging residents and developers in dialogue to ensure that density bonus programs align with community needs and priorities.

Equity & Justice: By incentivizing the integration of affordable housing units, this action promotes socio-economic diversity within developments. Increasing housing options for various income levels will foster inclusivity and reduce housing access disparities.

Monitoring Success of Action J4:
Quantitative Metrics: 1) Total number of density bonuses allocated to affordable housing developments. 2) Percentage increase in affordable housing units. 3) Range of income levels served by new developments. 4) Impact on local economic markets and land use.

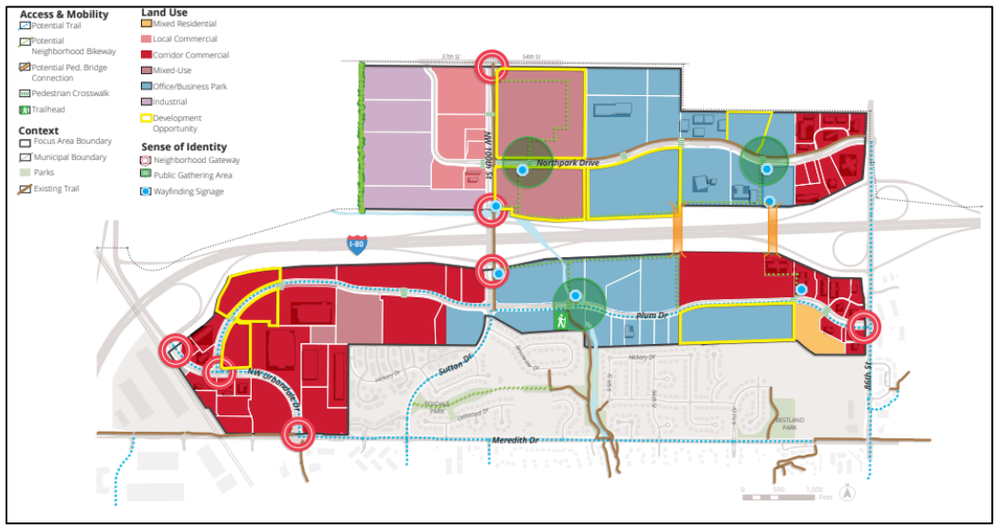
Qualitative Metrics: Community feedback on the demographic inclusion of new housing developments.

Action J5: Increase the development of affordable housing (long-term, adaptation).

Leveraging zoning regulations is one way to encourage the construction of affordable housing units within mixed-use developments. Adding diversity of commerce to new housing developments will increase social and economic connectivity in addition to real estate value over time.

Figure 4.40 is the NorthPark/Plum Drive focus area. This area, found in the central part of Urbandale, is mostly undeveloped and shovel-ready. The focus area wants to accommodate high-density housing and mixed-use development in strategic locations. By allowing for additional and affordable housing in the area, the city can have more support for local-serving retail and restaurants, ultimately strengthening the overall economic viability of the area.

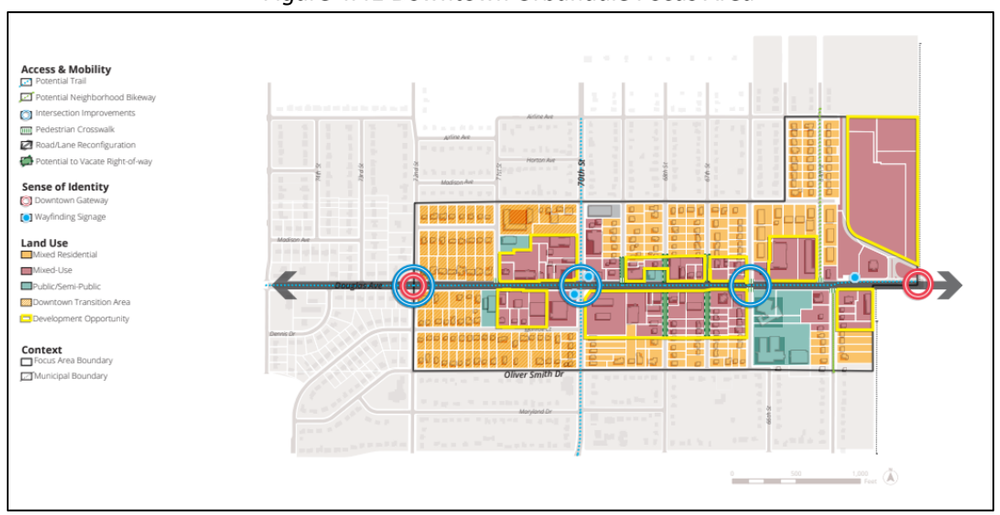
Figure 4.40 NorthPark/Plum Drive Focus Area



Source: Forward Urbandale Comprehensive Plan, 2023

Downtown Urbandale is another area, shown in Figure 4.41, that can be an option for new and affordable housing. Mixed residential land use is one of the major intended uses for this area in Urbandale. *The Urbandale Forward Comprehensive Plan* already plans on improving and reinvesting into this downtown area which would make the area a great place for future housing. Iowa Thriving Communities could also give Urbandale an advantage on Workforce Housing Tax Credits which would be great for projects in this area.

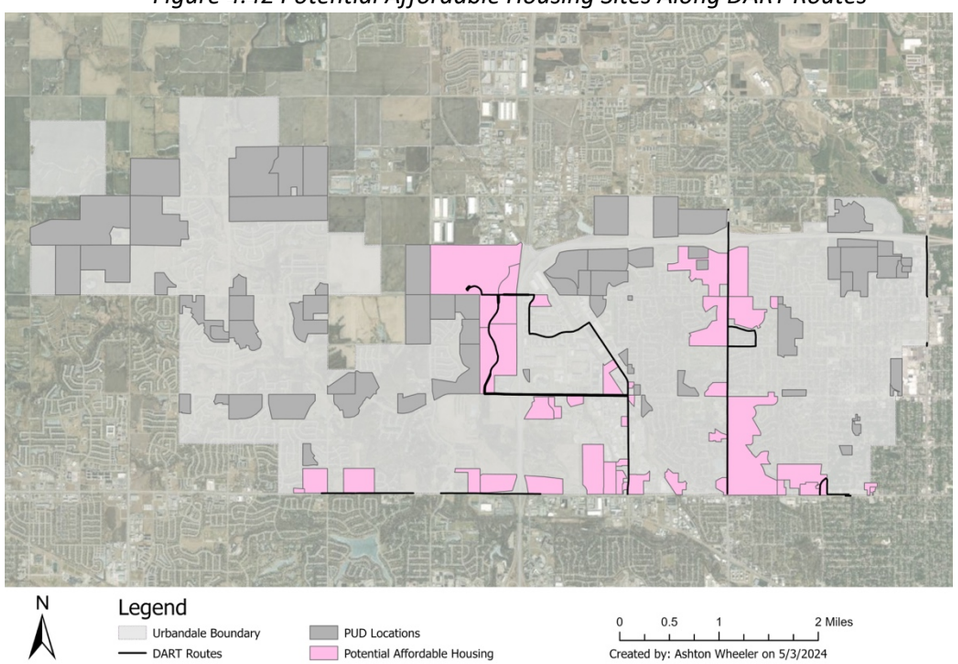
Figure 4.41 Downtown Urbandale Focus Area



Source: Forward Urbandale Comprehensive Plan, 2023

Figure 4.42 highlights potential areas along DART routes that could be used for affordable housing. Mapping potential affordable housing sites along DART routes is crucial for sustainable urban planning. It ensures that affordable housing is accessible to public transportation, which can significantly reduce living costs for residents by minimizing the need for private vehicles. Additionally, such strategic placement of housing can lead to increased ridership for DART, supporting the transit system's viability and sustainability. Furthermore, aligning housing with transit routes can promote equitable growth, ensuring that all residents have access to essential services and employment opportunities, fostering a more inclusive city environment.

Figure 4.42 Potential Affordable Housing Sites Along DART Routes



Source: DART Routes, 2024

Potential Partners: Affordable Housing Developers, Iowa Finance Authority, Iowa Economic Development Authority.

Funding: Workforce Housing Tax Incentive Program (WHTIP), Low-Income Housing Tax Credits (LIHTC), Iowa Thriving Communities Program.

Community Engagement: Public outreach campaigns will be conducted to increase awareness and participation in initiatives to increase the development of affordable housing with mixed-use zoning. This will involve disseminating information through various channels, such as social media and community events, to engage residents and stakeholders in the planning and implementation.

Equity & Justice: Integrating affordable housing options within developments enhances equity by providing diverse housing opportunities and reducing socio-economic segregation within the community.

Monitoring Success of Action J5:
Quantitative Metrics: 1) Total number of new affordable housing units in mixed-use developments. 2) Range of income levels served by new developments. 3) Impact on local economic markets and land use seen through property value analysis, economic activity indicators, and land use changes.

Qualitative Metrics: Community feedback on the demographic inclusion of new housing developments through public surveys.

Action J6: Advance the revitalization of downtown by rehabilitating existing structures and creating a return on investment for the community (long-term, adaptation).

Revitalization of old and deteriorating buildings provides cost and energy savings over new construction and prevents additional use of undeveloped land. Capitalizing on the

redevelopment of underutilized and dilapidated areas will increase local real estate value and provide greater economic output.

Potential Partners: Main Street Iowa, Iowa Economic Development Authority, Local Developers.

Funding: Community Catalyst Building Remediation Grant, Community Development Block Grant (CDBG) Sustainable Community Demonstration, Main Street Iowa Program.

Community Engagement: Active engagement with residents, business owners, and stakeholders through public forums, community meetings, and digital platforms ensures inclusive decision-making and reflects diverse perspectives. By fostering open dialogue and participation, the revitalization process can better meet the needs and aspirations of the community.

Equity & Justice: This action promotes equity by revitalizing downtown areas, preserving heritage, and creating economic opportunities. By rehabilitating existing structures, it fosters inclusivity and shared prosperity for all residents. Ensuring community benefits through increased property values and job creation helps distribute the advantages of revitalization equitably, enhancing overall community well-being in Urbandale, specifically in the downtown area.

Monitoring Success of Action J6:
*Quantitative Metrics***:** 1) Total number of rehabilitated buildings in Urbandale. 2) Percentage increase in revitalized infrastructure compared to new construction. 3) Percentage increase in surrounding property values. 4) Impact on local economic markets and land use seen through property value analysis, economic activity indicators, and land use changes.

Qualitative Metrics: 1) Community feedback on the output of newly revitalized areas through public surveys. 2) Sense of place for Urbandale residents determined through interviews and community perception surveys.

Chapter 5: Implementation

PRIORITIZED ACTIONS

The SUAP draws inspiration from the *2023 Green Cincinnati Plan* (GCP) to prioritize actions. The priority ranking of each action in the SUAP is guided by its alignment with sustainable development codes and community input. The results from community engagement event surveys were used to reveal the highest-voted topics, categorized by sustainable development code or additional priorities. Renewable energy, infill development, and the costs of actions are the most critical conditions for Urbandale residents. Additionally, increasing education about sustainability is a major goal of the City of Urbandale.

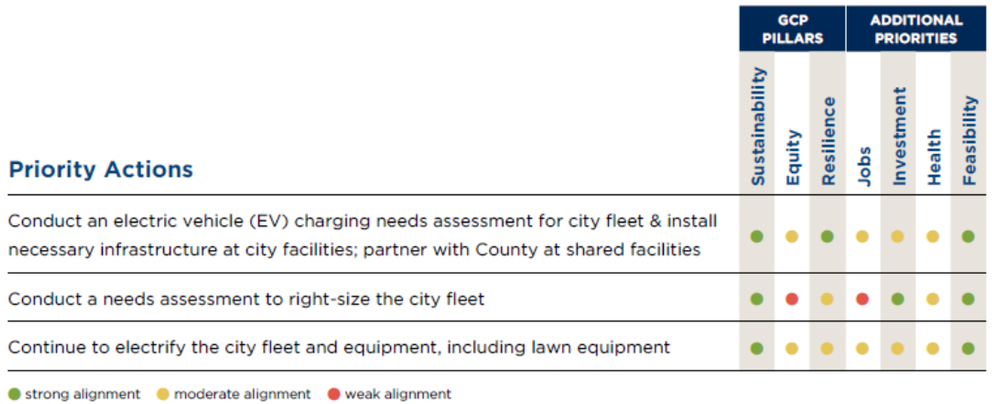
The counts from surveys and engagement results are distributed as weights to four categories: costs, renewable energy, infill development, and education. All actions are grouped by short-term, mid-term, or long-term.

This plan does not define the departments within Urbandale's local government that are going to be involved in the implementation process. The city planners and staff will decide how the SUAP's goals and actions will be implemented.

Methodology

Action alignment used in the *2023 Green Cincinnati Plan*, as seen in Figure 5.1, organizes actions by "pillars" and "additional priorities." The plan steering committee created the pillars, and the city decided on priorities by aggregating terms from community engagement events. Using a similar process, the SUAP's actions are prioritized based on community engagement survey data.

Figure 5.1 2023 GCP Matrix



Source: City of Cincinnati, 2023.

The SUAP survey results revealed the respondents' top priorities (and the number of votes per priority): renewable energy (12), start-up costs (9), feasibility (7), and infill development (7). The "start-up costs" and "feasibility" priorities were combined into one category, titled "cost," accounting for 16 total votes. Additionally, the City of Urbandale identified education as a top priority to pair with plan implementation. Therefore, education is the final category, with five votes. Each action is rated as "applicable" or "not applicable" to the category, with a 1 for the former and a 0 for the latter. The cost category is an exception. Cost is judged as "low" or "high," still indicated as 1 for the former and 0 for the latter.

The number of votes per category established weights that determined a priority ranking of all actions. The weights were created by taking the number of votes per category and dividing them by the total number of votes. For example, the renewable energy category has 12 votes. This number is divided by the total number of responses (40) to create a weight of 0.3. If an action is associated with renewable energy, it will receive an applicable rating of 1 in the table. Then, 0.3 will be included in a sum to determine the action's final score. This score is calculated based on each weight number the action receives, indicated by the applicability point. The final scores are between 0 and 1; actions with a score closest

to 1 are of the highest priority. Each action is governed within timeframe groups—divided into short-term, mid-term, or long-term, organized into three tables.

TABLE 5.1 SHORT-TERM ACTIONS

Topic	Actions	Cost	Renewable Energy	Infill Development	Education	Score
People	**A2:** Enhance the city website to provide residents easy access to sustainable practices and low-carbon solutions.	1	0	0	1	0.525
People	**A6:** Launch and publicize the game Renewable Rescuers to allow for fun and free education on renewable resources and sustainability.	1	0	0	1	0.525
Renewable Energy	**B1:** Expand participation with the U.S. Department of Energy's *SolSmart Program* to remove red tape on implementation.	0	1	0	0	0.3
Renewable Energy	**C1:** Inventory GHG Emissions yearly to monitor plan effectiveness.	0	1	0	0	0.3
Renewable Energy	**C2:** Create an energy audit program with a checklist for improving efficiency for both residential and commercial properties.	0	1	0	1	0.425
Net-Zero Energy	**D4:** Encourage buildings to attain an International Living Future Institute's Zero Carbon certification.	1	1	0	0	0.7
Net-Zero Energy	**E6:** Identify business owners who have changed their source of energy to renewable sources and create a video with them to share success stories.	1	1	0	1	0.825
Conservation	**F2:** Promote and expand the *Storm Water Grant Program* to include green roofs.	0	0	0	0	0

Conservation	**G1:** Reduce parking minimums to provide opportunities for green space.	1	0	1	0	0.575
Conservation	**G2:** Amend the zoning ordinance to classify the growth of native plants as permitted or by-right uses on private property.	1	0	1	0	0.575
Conservation	**G6:** Establish a residential rebate program to incentivize planting native species.	0	0	1	1	0.3
Urban Mobility	**H1:** Upgrade wayfinding signage along paths and roadways.	1	0	1	1	0.7
Urban Mobility	**H2:** Enhance pathway infrastructure by repairing uneven surfaces and removing debris.	0	0	1	0	0.175
Food Access	**I1:** Conduct a site suitability analysis for potential new community gardens.	0	0	1	1	0.3
Food Access	**I4:** Create a local farmers' market.	0	0	1	1	0.3
Land Use Development	**J4:** Offer density bonuses for developers who incorporate affordable housing units into their projects.	1	0	1	0	0.575

TABLE 5.2 MID-TERM ACTIONS

Topic	Actions	Cost	Renewable Energy	Infill Development	Education	Score
People	**A3:** Partner with other organizations to develop a green business incubator.	0	0	0	1	0.125
People	**A4:** Partner with local organizations and education institutions to organize workshops and seminars on sustainability and low-carbon solutions.	0	1	0	1	0.425
People	**A5:** Partner with other organizations to provide green jobs training to enhance the labor workforce.	0	0	0	1	0.125
Renewable Energy	**B2:** Participate in a Solar Group Buy program to lower the initial costs of solar panels on residential, industrial, and commercial properties.	0	1	0	0	0.3
Renewable Energy	**C3:** Perform a code cleanup to reduce barriers for residents to implement renewable energy.	1	1	0	0	0.7
Net-Zero Energy	**D2:** Encourage homeowners to prioritize attic insulation with energy audits.	0	0	0	1	0.125
Net-Zero Energy	**D3:** Create inclusive weatherization assistance by incorporating language interpretation services and incentives for all.	0	0	0	1	0.525
Net-Zero Energy	**E1:** Implement a light bulb swap to reduce the usage of older lightbulbs.	1	0	0	1	0.525
Net-Zero Energy	**E3:** Implement a tax credit for geothermal implementation.	0	1	0	0	0.3

Net-Zero Energy	***E5:** Develop an appliance exchange program.					
Conservation	**F4:** Increase educational signage along public trails and green spaces.	1	0	1	1	0.7
Conservation	**G3:** Adapt public green space to include more local flora and fauna.	1	0	1	1	0.7
Urban Mobility	**H3**: Improve pedestrian safety by providing lighting along walkways.	1	0	1	0	0.575
Food Access	**I2:** Establish community gardens in vacant lots and public spaces.	1	0	1	0	0.575
Food Access	**I3:** Implement community gardens in public schools.	1	0	0	1	0.525
Food Access	**I5:** Develop a program to deliver fresh food and food cooperatives to the community.	0	0	0	1	0.125

* These actions were not given priority calculations as they were created after the metric system was finalized.

TABLE 5.3 LONG-TERM ACTIONS

Topic	Actions	Cost	Renewable Energy	Infill Development	Education	Score
People	**A1:** Create and fill a sustainability coordinator position.	0	0	0	1	0.125
Renewable Energy	**B3:** Provide density bonuses for sites that include solar on the building and/or property.	1	1	1	0	0.875
Renewable Energy	**C4:** Collaborate with local financial institutions to offer low-interest loans for renewable energy projects and facilitate power purchase agreements between businesses and renewable energy providers.	0	1	0	0	0.3
Renewable Energy	**C5:** Financially support low-income communities and identify local businesses or organizations that support the mission as resilience hubs.	0	0	0	1	0.125
Renewable Energy	**C6:** Implement a geothermal heating and cooling district.	0	1	1	0	0.475
Renewable Energy	**C7:** Replace all city-owned lights with LEDs for greater energy efficiency.	1	0	0	0	0.4
Net-Zero Energy	***D1:** Implement an efficiency standard for new construction covering insulation, appliances, and power generation offset.					
Net-Zero Energy	**E2:** Develop an Energy Equity program that improves energy efficiency with low-cost assistance for all.	0	0	0	1	0.125
Net-Zero Energy	***E4:** Establish a retrofit tax credit program for residential housing.					

Conservation	**F1:** Prioritize NBS in stormwater management strategies.	0	0	1	0	0.175
Conservation	**F3:** Explore the use of permeable surfaces on city-owned properties.	0	0	1	1	0.3
Conservation	**G4:** Prioritize development in areas less susceptible to environmental risks.	1	0	1	0	0.575
Conservation	**G5:** Increase tree canopy and urban forestry.	0	0	1	1	0.3
Urban Mobility	**H4:** Implement bike- and pedestrian-focused projects in high-demand areas identified in the *Complete Streets Master Plan.*	0	0	1	0	0.175
Urban Mobility	**H5:** Prioritize trail construction based on respondents' “very comfortable” ratings.	0	0	1	0	0.175
Food Access	**I6:** Adopt urban agriculture ordinances that provide a framework for food growing practices.	1	0	1	0	0.575
Land Use Development	**J1:** Develop mixed-use zoning regulations with incentives for integrating residential, commercial, and recreational spaces within walkable areas.	1	0	1	0	0.575
Land Use Development	**J2:** Create transit-oriented development zones around public transportation.	0	0	1	0	0.175
Land Use Development	**J3:** Prioritize the removal of parking minimums for other uses.	1	0	1	0	0.575

Land Use Development	**J5:** Increase the development of affordable housing.	0	0	1	0	0.175
Land Use Development	***J6:** Advance the revitalization of downtown by rehabilitating existing structures and creating a return on investment for the community.					

* These actions were not given priority calculations as they were created after the metric system was finalized.

APPENDIX A

Chamber of Commerce Event Questions

Q: What is your occupation and business affiliation?

Q: Rank the following sustainability strategies based on their importance to you.

Order them from 1, as most important to 4, to least important.

- Geothermal/Biomass Energy
- Net-Zero Energy Building
- Solar Energy
- Infill Development

Q: How feasible do you find these sustainability strategies for the future of Urbandale?

Very Unfeasible, Unfeasible, Feasible, Very Feasible, Unsure

- Geothermal/Biomass Energy
- Net-Zero Energy Buildings
- Solar Energy

Q: To what extent do you believe these sustainability strategies align with the priorities and values of the Urbandale community?

Not Aligned, Partially Aligned, Mostly Aligned, Strongly Aligned, Completely Aligned

Q: How likely are you to implement these sustainability strategies in your business?

Very Unlikely, Unlikely, Likely, Very Likely, Unsure

- Geothermal/Biomass Energy
- Net-Zero Energy Buildings
- Solar Energy

Q: Which of the following factors does your business currently face in implementing sustainability strategies?

Start-up costs, lack of information, uncertainty about feasibility, lack of partners, lack of support from local government, none, other (please explain)

APPENDIX B

Library Event Survey Questions

Q: Rank the sustainability strategies based on their importance to you

Order them from 1, as most important to 4, to least important.

- Using renewable energy
- Encourage infill development
- Constructing net-zero energy buildings
- promoting justice
- accessing nutritious food

Q: The City of Urbandale is Exploring Strategies to encourage sustainability (Rate your level of agreement with the statements below.)

Strongly Disagree, Disagree, Neutral, Agree, Strongly Agree, Do Not Know

- Develop infill lots as walkable and bikeable places
- Promote the construction of net-zero energy buildings
- Implement large-scale solar energy projects
- Support renewable energy technology for low-income households
- Develop more affordable housing
- Construct shops in my neighborhood

Q: How likely are you to implement these sustainability strategies in your personal life/home? (please rate the strategies based on the likelihood of implementation below).

Very Unlikely, Unlikely, Likely, Very Likely, Unsure

- Geothermal/Biomass Energy
- Net-zero energy
- Solar energy

Q: What is your occupation?

Q: What is your age group?

- 10 or younger
- 11-17
- 18-24
- 25-34
- 35-44
- 45-54
- 55-64
- 65 or over

Q: What is the primary type of housing where you reside?

- single-family house
- apartment
- Townhouse

APPENDIX C

Focus Groups Questions

Background & Community

1. Tell us your name, when you moved to Urbandale, and what you like to do in the community in your free time.
    a. Have you lived anywhere else in the United States?
    b. Which family members are here with you in Urbandale?
2. What has life been like for you and your family in Urbandale?
    a. How is your life different here than in your home country?
    b. Has life in Urbandale been what you expected?
    c. What do you like about Urbandale?
    d. What do you find challenging about living in Urbandale?
3. What is the first thing that comes to mind when you hear community involvement?
    a. Is there a strong sense of community where you live?
        i. Do neighbors look out for one another? Help each other out?
        ii. How has the community worked together in the past to solve a problem?
        Or have members of the community ever helped you with a problem?

Affordable Housing

4. When you first moved to Urbandale, what was your experience in finding housing?
5. What challenges have you or anyone you know experienced in finding affordable housing?
6. Can you describe your overall experience with electricity services?
7. Do you have any suggestions for the City of Urbandale on how to address affordable housing?
8. What do you think the City of Urbandale should do in addressing the issue of affordable housing?
9. How do you think the lack of affordable housing impacts your community?

Food Access & Urban Agriculture

10. How do you feel about food shopping in Urbandale?
11. Do you have any suggestions for the City of Urbandale on increasing food access?
12. How do you find foods and ingredients for traditional meals?
13. Where do you shop for food?
    a. Can you tell me a bit about the quality of food where you shop?
    b. Can you tell me about how affordable the food is in the place where you shop?

Transportation & Mobility

14. How do you feel about walking and biking in Urbandale?
15. Do you have any suggestions for the City of Urbandale about walkability and biking?
16. What method of transportation do you use and can you describe the service and your experience with it? (walking, driving, biking, bus system)
17. How long does it take you? How far is the distance?
18. What makes you choose to get around this way? (Probe: Cost, time, convenience)

Ending Questions

19. If you had the chance to speak with the City of Urbandale, what suggestions would you give them? (in relation to affordable housing, food accessibility, and transportation or a different topic)
20. Is there anything we didn't talk about today but should have? If so, what?

APPENDIX D

Funding Descriptions

Action A3:

The Redevelopment Tax Credit (RTC) for Brownfield or Greyfield Sites:

Restoration projects of underutilized properties can receive funding through the Redevelopment Tax Credits. This program is offered through the Iowa Economic Development Authority (IEDA) and covers up to 24% of qualifying costs for brownfield projects and 12% for greyfield projects. Higher percentages of project funding are available if green building requirements are met. Small investments from local businesses can also play a crucial role in community development projects. These investments often come in the form of financial contributions, in-kind services, or expertise, contributing to the overall economic growth and sustainability of local initiatives (IEDA, n.d.).

Action A4:

The Environmental Workforce Development and Job Training (EWDJT) Grant:

Supports nonprofit organizations in delivering training programs to local, unemployed, and underemployed residents, focusing on brownfield site assessment, cleanup, and reuse preparation. This federal grant can be awarded to any local communities or non-profit organizations who are deemed in need of the assistance (Environmental Protection Agency, n.d.).

Action A4:

The Workforce Training and Economic Development (WTED) Fund:

Supports community college programs, focusing on career and technical education. It was originally established as part of the Grow Iowa Values Fund and is available for all Iowa communities to apply. It supports initiatives like career academies, entrepreneurship education, and targeted industries, with a significant portion allocated to advanced manufacturing and information technology clusters (WTED Fund, 2024).

Action A5:

The Energy Efficiency Conservation (EEC) Block Grant:

This grant comes from the U.S. Department of Energy to assist states, local governments, and Tribes in implementing strategies to reduce energy use, reduce fossil fuel emissions, and improve energy efficiency. Though this is a national program, the State of Iowa is eligible to apply for the EEC Block Grant in order to help cities within the state. The program offers both formula and competitive grants, with resources available to help eligible entities apply and manage their projects effectively (Energy Efficiency and Conservation Block Grant Program, n.d.).

Action B1, B2, B3, C1, C5, C6, C7:

Local Government Energy Program: Communities Sparking Investment in Transformative Energy (C-SITE):

This grant aims to further technology areas, including building efficiency and electrification, electric transportation, energy upgrades, microgrid development, renewable energy, resilience hubs, and workforce development (U.S. Department of Energy, n.d.).

Action B1, B2, B3:

Environmental Protection Agency Air Grants and Funding (EPAAGF):

These grants offer funding for projects relating to air quality, transportation, climate change, indoor air, and more. There are many grants listed in this category that are either competitive or non-competitive, with emphasis on different elements of this SUAP (EPA, 2024).

Action B3, C1, C2, C3, C4, C5, C6, C7, J1:

Tax Increment Financing (TIF) Districts:

Tax Increment Financing (TIF) districts work by capturing the increase in property tax revenue generated from new development within a designated area. These funds are then reinvested into the district for infrastructure improvements, environmental protection projects, or other community enhancements (U.S. FHA, 2021).

Action B3, C2, C3, C4, C5, C6, C7:
Environmental Protection Agency: Environmental Justice (EPAEJ):
These grants provide financial assistance to support communities and organizations to collaborate and partner with other stakeholders to develop and implement solutions that will significantly address environmental issues at the local level (U.S. EPA, 2023).

Action B3, C2, C3, C4, C5, C6, C7:
Municipal Bonds:
Municipal bonds, issued by local governments or agencies, allow them to raise funds for various projects like infrastructure, schools, or utilities. Investors purchase these bonds, essentially lending money to the municipality, and in return receive periodic interest payments until the bond matures, at which point the initial investment is repaid (U.S. SEC, 2024).

Action C3:
Bipartisan Infrastructure Law (BIL): Resilient and Efficient Codes Implementation:
This grant aims to advance building codes and support successful implementation. Updating to more efficient building energy codes saves money for homes and businesses, reduces GHG emissions, and encourages more resilient buildings (USDA, 2024).

Action D1:
Home Electrification and Appliance Rebates (HEAR) Program:
The Home Electrification and Appliance Rebates Program awards grants to state energy offices and tribal entities to support the planning, administration, and technical assistance of home electrification. The program is available through 9/30/2031 and has $4,500,000,000 available for funding through grants. Iowa's portion of the grant is $121,178,511. This will be administered through the Iowa Energy Center, estimated to launch in mid- to late-2025 (Energy Star, n.d.).

Action D1:
Midwest Building Decarbonization Coalition (MBDC):
The Midwest Building Decarbonization Coalition provides participation stipends to support individuals and organizations doing building decarbonization work to alleviate the financial barrier. The Coalition also provides empowerment grants that are available to community-based organizations that are working on decarbonization and equity. Cities in Iowa are eligible to apply for the grants. The grant period is once a year and ranges from $10,000 to $50,000. The Midwest Building Decarbonization has $1,526,315 available for funding (MBDC, n.d.).

Action D2, D3:
Weatherization Assistance Program (WAP):
The Weatherization Assistance Program is provided by the U.S. Department of Energy to reduce energy costs for low-income households by increasing home energy efficiency. This program includes the Enhancement & Innovation Grant, the Sustainable Energy Resources for Consumers Grant, and the Community Scale Pilot Program. This program has received nearly $3.5 billion of funding and cities in Iowa are eligible to apply (Energy Star, n.d.).

Action D2, D3, E2:
Low-Income Home Energy Assistance Program (LIHEAP):
The Low-Income Home Energy Assistance Program is federally funded and open to Iowa cities for application. The program supports low-income families in Iowa to meet home heating costs by providing a one-time payment to their heating utility. The size of the grant is based on the household size and annual gross income, but the applicant's total household income must be at or below 200% of the 2023 federal poverty guidelines. Applications are held on a first-serve basis from November 1 to April 30 each year. Households with members that are over 60 years old, disabled, or in crisis can begin to apply on October 1 (Energy Star, n.d.).

Action D4:
Green and Resilient Retrofit Program (GRRP):
The Green and Resilient Retrofit program, funded by the Department of Housing and Urban Development (HUD), provides funding through direct loans and grants for projects that improve building energy efficiency and sustainability. Applications are reviewed four times throughout the year in June, September, March, and July. There is approximately $1,470,000,000 of funding (HUD, 2023).

Action E1, E2:
Energy Advantage Deferred Loan (EADL):
The Neighborhood Finance Corporation created the Energy Advantage Deferred Loan. This loan is available for individuals and businesses to add or replace items like solar, heat pumps, efficient HVAC systems, Energy Star windows, and doors, etc. This loan is a $10,000 deferred loan with 0% interest that is paired with an NFC repayable and forgivable loan. This loan was created in 2023 and is currently active (NFC, 2023).

Action E2:
Polk County Large Renovation Gap Funding Program (LRGFP):
The Large Renovation Gap Funding Program is funded by a $6 million grant from Polk County. Homeowners with household incomes below 80% of the Polk County area median income are eligible to receive up to $50,000 for home repairs. The goal of this program is to create sustainable and safe living conditions for existing homeowners who may not be able to afford repairs on their homes (NFC, 2024).

Action E2, E3:
Federal Income Tax Credits for Efficiency Upgrades (FITCEU):
The Federal Income Tax Credits for Efficiency Upgrades provide tax credits that can cover 30% of the project cost for qualifying home improvements. In order to qualify for a tax credit, the resident must be located in the United States; therefore, those in Iowa are eligible to apply. The maximum credit one can claim each year is $1,200 for energy property costs and certain home improvements with limits on doors, windows, and home energy audits. $2,000 annually can be applied for qualified heat pumps, biomass stoves, or biomass boilers. Individuals can claim credit for improvements made through 2032 (Energy Star, 2024).

Action E2, E4, E5:
Energy Efficiency and Conservation Block Grant (EECBG):
The Energy Efficiency and Conservation Block Grant provides $8.8 million for small-to-medium-sized local governments and state-recognized tribes. This grant is also open for cities in Iowa to apply to (minimum award of $200,000):

(1) Reduce fossil fuel emissions in ways that are environmentally sustainable and maximize benefits for local and regional communities;
(2) Reduce the total energy use of the eligible entities;
(3) Improve energy efficiency in the transportation, building, and other sectors;
(4) Build a clean and equitable energy economy that prioritizes disadvantaged communities and promotes equity and inclusion in workforce opportunities and deployment activities, consistent with the Justice40 Initiative (U.S. DOE, n.d.).

Action E4, E5, E6:
Building Resilient Infrastructure and Communities Grant (BRIC):
The BRIC Grant assists states, local communities, tribes, and territories with hazard mitigation planning and projects to reduce the risk of damage before a disaster. This annual grant is typically available at the end of September and closes around January of the following year. FEMA allocates different amounts for the grant every year. For example, FEMA designated $2.295 million for funding in 2022 and is open for cities in Iowa to apply (FEMA, 2023).

Action E4, E5, E6:
Green Bonds:
Green Bonds are fixed-income debt where an issuer borrows a large sum of money from investors for use in sustainability-focused projects. In the U.S., green bonds are typically issued for $10 million to $100 million. Bonds of less than $10 million are used by municipal organizations. Green bonds are issued yearly and available for development projects in Iowa (DOE, 204).

Action F1:
National Fish and Wildlife Foundation (NFWF), America the Beautiful Challenge:
The National Fish and Wildlife Foundation provides funding for new conservation and restoration projects around the U.S. This challenge consolidates funding from multiple federal agencies and the private sector to enable applicants to conceive and develop large-scale projects that address shared funder priorities and span public and private lands. The first round of proposals is usually due in April. Prospective applicants must attend a pre-application webinar and then apply for the first deadline, with a second deadline in June. The funding available through this program can be between $200,000 and $2,000,000 with most coming on the lower end, unless doing multi-jurisdictional projects (NFWF, n.d.).

Action F2:
Storm Water Grant Program:
The Storm Water Grant Program is currently funded by a portion of the Storm Water Utility Fees and could be increased in funding through higher rates. If additional funding is needed, increasing the utility fee is a possible option, or allocating more of it to this program (City of Urbandale, n.d.).

Action F3:
Iowa Department of Agriculture and Land Stewardship (IDALS), Water Quality Initiative Program:
The Water Quality Initiative Program application is not currently open but is typically open until November. This program focuses on using the tools known to work, such as targeted and voluntary conservation measures, in conjunction with research, development, and demonstration of new approaches. This program's goal is to apply proven practices in fields and cities across Iowa. The funding available is not specified anywhere, as each project is different (IDALS, n.d.).

Action F3:
Iowa Department of Agriculture and Land Stewardship (IDALS), Iowa Conservation Infrastructure Project Program:
The Iowa Conservation Infrastructure Project Program looks to improve water quality by employing the collective ability of both private and public resources, organizations, and private-public resources to rally around the Nutrient Reduction Strategy and implement proven conservation practices. This opportunity for funding through Iowa is an open application that does not have specific application dates or deadlines. The funding available is not specified anywhere, as each project is different (IDALS, n.d.).

Action F4:
Environmental Protection Agency (EPA) Environmental Education Grants:
Projects funded by the EPA Environmental Education Grant promote environmental awareness and stewardship and help provide residents with the skills to take responsible actions to protect the environment. This grant program provides financial support for projects that design, demonstrate, and/or disseminate environmental education practices, methods, or techniques. This grant opportunity is not currently open but is typically open till November. There is no specific amount that each project typically gets. The total amount per year that is given out is typically between $2,000,000 and $3,500,000 throughout the United States (EPA, n.d.).

Action G3, G6:
Iowa Native Plant Society Small Grants Program:
The Iowa Native Plant Society provides funding to increase the appreciation and enjoyment of Iowa's native flora and to foster programs focusing on education, conservation, and the ethical use of native plants. The applications and proposals are currently closed but are normally open until January 15. The available funding is typically between $500 and $1,250 at the maximum.

Action G5:
MidAmerican Trees Please!:
This program promotes tree planting through $1,000 grants and educational materials targeting local municipalities. Trees are to be planted near publicly owned properties like schools, libraries, city halls, and more. Any town or city in MidAmerican's service territory can apply annually for a grant to plant trees in their community. There is an application process that says municipalities receive the application (MidAmerican Energy Company, n.d.).

Action G5:
Iowa Department of Natural Resources (DNR) Community Forestry Grant:
The Community Forestry Grant Program provides reimbursable grants ranging from $500 to $5,000; this is to be used for the purchase and planting of trees suitable to Iowa. This Community Forestry Grant is available to state and local governments, entities, schools, and volunteer/service organizations involved with local urban and community forest services. This program focuses on planting trees on publicly owned lands owned by state, county, or local governments located within the State of Iowa. Applications are usually open in December and then close on March 1(Iowa DNR, n.d.).

Action H1:
Iowa DOT, Iowa Sign Replacement Program (ISRP):
The Iowa Sign Replacement Program replaces damaged, worn out, obsolete, or substandard signs and signposts for cities and counties in Iowa. Before grant submissions, a required assessment of the need, proper location, and installation of posts will be needed. Cites are eligible to receive up to $5,000 towards sign replacement (Iowa DOT, n.d.).

Action H2:
Federal Highway Administration, Sidewalk Millage Tax (SMT):
One way to target funding for pedestrian facilities is through a Sidewalk Millage Tax. This tax was initially proposed by the city as a means to tackle sidewalk maintenance issues overlooked by the city's code, which assigns sidewalk upkeep to adjacent property owners (7 Funding, n.d.).

Action H3, J2:
U.S. Department of Transportation, Safe Streets, and Roads for All Program (SS4A):
The SS4A program offers implementation grants to execute strategies or projects identified within Urbandale's *Complete Streets Master Plan*. The program funds initiatives to prevent deaths and serious injuries on roads for all users, including pedestrians, cyclists, and motorists. It supports comprehensive safety action plans and projects through Planning and Demonstration Grants and Implementation Grants. The awardable funding floor is $100,000, and the ceiling for funding is $25,000,000 (U.S. DOT, n.d.).

Action H4, H5:
Des Moines MPO, Surface Transportation Block Grant Program Set-aside (TAP):
With Urbandale being a member of the Des Moines MPO, Urbandale is eligible for funding through TAP. The program supports projects defined as transportation alternatives, including on- and off-road pedestrian and bicycle facilities, infrastructure projects for improving non-driver access to public transportation, environmental mitigation, and safe routes to school projects. The Des Moines MPO has up to $1.2 million in funds to allocate toward TAP projects. The next estimated window to apply for TAP funding is December 1, 2025 (DMAMPO, n.d.).

Action I1, I2, I5:
USDA Urban Agriculture and Innovative Production Grants (UAIP):
With this grant, local governments are eligible to receive funds between $75,000-$350,000 toward the implementation and/or planning of urban agriculture projects. Planning programs initiate and expand efforts of farmers, gardeners, citizens, government officials, and schools in urban areas and suburbs, particularly where access to fresh foods is limited or unavailable. The next estimated deadline to apply for the UAIP Planning grant is April 9, 2025 (UAIP. USDA, n.d.).

Action I3:

Iowa Farm-to-School Program (FSP):

The Iowa Farm-to-Summer Campaign works to increase youth participation at established Iowa summer meal sites. The Farm-to-School Program is coordinated by the Iowa Department of Agriculture and Land Stewardship in partnership with the Iowa Department of Education. The program integrates nutrition lessons with meals and offers engaging activities like Ag-in-the-Classroom sessions, school gardens, food tastings, cooking classes, and farm visits to promote healthy eating habits among children. Through Urbandale's public-school system enrollment in the Summer Food Service Program, the district is eligible to receive up to $750-$1,000 in funding. The next estimated deadline to apply for the Iowa Farm-to-School Program is April 8, 2025 (FSP, 2024).

Action I4:

USDA Farmers Market and Local Food Promotion Program (FMPP):

The FMPP is implemented under the Local and Agriculture Market Program. Local governments are eligible for FMPP funds that enable projects that develop, coordinate, and expand direct producer-to-consumer markets to help increase access to and availability of locally and regionally produced agricultural products. Four types of project funding are available: Capacity Building ($50,000 to $250,000), Community Development Training and Technical Assistance ($100,000 to $500,000), Turnkey Marketing and Promotion, and Turnkey Recruitment and Training (both ranging from $50,000 to $100,000). The next estimated deadline to apply for the FMPP grant is May 14, 2025 (FMPP, 2020).

Action J1, J5:

Workforce Housing Tax Incentive Program (WHTIP):

The Iowa Economic Development Authority offers this program that provides tax incentives to developers for the creation and rehabilitation of housing in Iowa, which can be part of mixed-use developments. It is designed to support the construction and renovation of housing in areas where there is a shortage of affordable housing options for the workforce (WHTC, n.d.).

Action J1:

Brownfield and Grayfield Redevelopment Tax Credits:

These tax credits are offered through the Iowa Economic Development Authority. It supports the redevelopment of underutilized or abandoned properties, which can be key sites for mixed-use developments (Redevelopment Tax Credits, n.d.).

Action J1:

Smart Growth Grants:

These grants are offered through the Environmental Protection Agency (EPA) and support communities that want to incorporate smart growth principles into their planning and development processes. Mixed-use planning incorporates smart growth principles which can make these developments qualify for the Smart Growth Grants (EPA, 2020).

Action J2:

Public Transit Infrastructure Grant Program:

Offered through the Iowa Department of Transportation (Iowa DOT), it provides funding for public transit-related infrastructure projects. These projects can include improvements necessary for transit-oriented development. This program aims to enhance public transportation services, increase efficiency, and promote the use of public transit as a viable alternative to private vehicles (Public Transit, n.d.).

Action J2, J3:

Community Development Block Grants (CDBG):

The CDBGs are offered through the U.S. Department of Housing and Urban Development (HUD). These grants support a wide range of community development activities, including infrastructure improvements that can facilitate transit-oriented development. There is a focus on improving the living conditions of low- and moderate-income residents. The goal of CDBGs is to develop viable urban communities by providing decent housing, suitable living environments, and expanding economic opportunities (CDBG Programs, n.d.).

Action J3:

Revenue from a Parking-User Tax:

A Parking-User Tax is a tax imposed on the use of parking spaces within a city. The revenue generated from this tax can be used to fund various urban development and infrastructure projects. These projects can support improving public transportation options or support projects that promote alternative modes of transportation (Iowa Sale and Use Tax, n.d.).

Action J4, J5:

Low-Income Housing Tax Credits (LIHTC):

These tax credits are offered through the Iowa Finance Authority. They provide tax credits to developers who build or rehabilitate affordable housing. The local government can use density bonuses as an incentive to encourage developers to apply for LIHTCs (LIHTC, n.d.).

Action J4:

Public-Private Partnerships (PPPs):

PPPs can encourage collaboration between private developers and the city to leverage additional funding and resources for affordable housing projects. Density bonuses along with other incentives like expedited permitting and reduced fees can encourage the incorporation of affordable housing units into newer projects (PPPLRC, n.d.).

Action J5:

Iowa Thriving Communities:

It is a program introduced by the Iowa Finance Authority and Iowa Economic Development Authority. This program elevates best practices from communities that are going above and beyond to leverage innovative methods to attract housing opportunities for their workforce. The program's application deadline is in May each year that it is offered. Being accepted into the program would give Urbandale a boost in receiving public financing support for housing. Figure 4.41 and Figure 4.42 both illustrate areas in Urbandale that could pair well with programs included in Iowa Thriving Communities (Iowa Thriving, 2024).

Action J6:

Community Catalyst Building Remediation Grant:

Community Catalyst and Building Remediation Grants provide funding for the redevelopment or rehabilitation of old buildings to stimulate economic growth or reinvestment in the community. The maximum grant award is $100,000, and 40% of the funds will be awarded to cities with populations under 1,500 (Community Catalyst, n.d.).

Action J6:

Community Development Block Grant (CDBG) Sustainable Community Demonstration:

The CDBG Sustainable Community Demonstration supports sustainable development practices by providing annual grants on a formula basis to states, cities, and counties to develop viable urban communities. This is achieved by providing decent housing and a suitable living environment and by expanding economic opportunities, principally for low- and moderate-income persons (CDBG, n.d.).

Action J6:

Main Street Iowa Program:

The Main Street Iowa Program provides services and grants for downtown revitalization projects, including building rehabilitations and streetscape improvements. This program provides technical assistance, education, training, and financial support to participating communities. To apply for this program, cities must submit an application form, a revitalization plan, a budget and funding plan, and support letters (Main Street Iowa, n.d.).

REFERENCES

City of Cincinnati, (2023), *Green Cincinnati Plan*