IOWA CITY

Climate Action and Adaptation Plan

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Acknowledgements

City of Iowa City

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» Kingsley Botchway II, *At-Large*
» Rockne Cole, *At-Large*
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» Mazahir Salih, *At-Large*
» Pauline Taylor, *District A, Mayor Pro Tem*
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Johnson County

» David Koch, *Public Health Director*
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Climate Action Steering Committee

Members of the Steering Committee were appointed by the City Council in January 2017.

» Chairperson: Ingrid Anderson, *University of Iowa, Environmental Compliance Specialist*
» GT Karr, *Greater Iowa City Home Builders Association, 2nd Vice President*
» Katie Sarsfield, *Procter & Gamble Oral Care, Site Engineering Leader*
» Jesse Leckband, *MidAmerican Energy Company, Sr. Environmental Analyst*
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» Matt Krieger, *Neumann Monson Architects, Licensed Architect*

At-large Representatives

» John Fraser, *Management Consultant*
» Charlie Stanier, *University of Iowa Associate Professor (College of Engineering)*
» Martha Norbeck, *Licensed Architect, C-Wise Design and Consulting*
» Eric Tate, *University of Iowa Assistant Professor (Department of Geographical and Sustainability Sciences)*
» Anne Russett, *former City Planner, City of Cedar Rapids; Senior Planner, City of Iowa City*

Student Representative

» Eden DeWald, ***University of Iowa***

Letter from Mayor Jim Throgmorton

Fellow Iowa Citians,

It is my great pleasure to present you with a Climate Action and Adaptation Plan for Iowa City.
Prepared by a 13-member Steering Committee in collaboration with City staff and a consulting team led by Elevate Energy, the Plan offers a way to turn the threats posed by global climate change into an opportunity: to build an economy and community that will sustain us and other living creatures long into the future.

When the City Council adopted a resolution to create the Steering Committee in April 2017, they made sure that the committee would include a diverse mix of residents and key stakeholders, including five members of the general public, an architect, an undergraduate at the University of Iowa, and representatives from the University, Kirkwood Community College, the Home Builders Association, the Chamber of Commerce, Procter & Gamble, and MidAmerican Energy.

The committee and consulting team have been quite busy over the past 14 months, trying to ensure that the Plan would be technically sound while also reflecting the interests and concerns of the public and local businesses. The committee and the consulting team met eight times between June 2017 and June 2018. Committee members also organized themselves into Equity, Outreach, and Adaptation subcommittees, and created a Draft Review subcommittee to review all preliminary versions of this Plan. Roughly 100 people participated in a Community Meeting last November, and approximately 800 individuals responded to an online survey earlier this year.

I invite you to read the Plan and find your own role within it.

Let me highlight just a few key features.

The Plan summarizes what your City government has done over the past decade to get us to this point. It provides background information about how our climate has been changing and is expected to change in the future. And it documents how our community-wide greenhouse gas emissions have changed over time.

I am especially pleased to report that our latest (2015) community-wide inventory shows that emissions have decreased by roughly 23 percent since 2005. This reduction brings us within just a few percentage points of our goal for 2025!

Although this reduction is pleasing, there is still a great deal more to do.

Most important, the Plan identifies 35 actions that will help us achieve our goals: to reduce our 2005 emissions roughly 30 percent by 2025 and 80 percent by 2050. Broadly speaking, these actions include partnership building, policy changes, education and awareness, pilot projects, lifestyle changes, and development of new programs.

Letter from Mayor Jim Throgmorton *continued*

The Plan also responds constructively to the regrettable likelihood that, as Iowa City's climate changes, some residents will be affected more adversely than others; for example, the ability to act quickly during emergency events will amplify vulnerabilities that currently exist for cost-burdened households, people with mobility issues, or households with language barriers. The Plan suggests ways to avoid or alleviate such inequities.

Reducing our greenhouse gas emissions 80 percent by 2050 and adapting to unavoidable changes in climate will be no easy task. These goals cannot be achieved by Iowa City government alone. Nor can they be achieved simply by adopting new rules and regulations.

For us to succeed, all parties will need to be moving in a common direction. City government will need to establish or build upon existing collaborative partnerships with other jurisdictions, businesses, industry, and community-based organizations.

Most important, we need to draw upon your knowledge, experience, insights, and action. For this reason, we seek your advice about how to improve the Plan and ensure it provides a viable and effective pathway into the future.

The future lies before us. Let us create it together.

Jim Throgmorton
Mayor of Iowa City

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IOWA CITY CLIMATE ACTION TODAY

STAR COMMUNITY RATING

GLOBAL COVENANT of MAYORS for CLIMATE & ENERGY

Letter From The Steering Committee

Dear Mayor, City Council, and fellow Iowa Citians:

Iowa City is well aware of the risk associated with climate change. Floods, droughts, and increasingly severe weather events illustrate the impacts that a changing climate can have on our community. We have an opportunity and a responsibility to take action to reduce greenhouse gas emissions and adapt to climate-related threats to our community.

In 2016, the City of Iowa City set ambitious emissions reduction goals for 2025 and 2050. To achieve these goals, the City determined that a Climate Action and Adaptation Plan would be necessary to guide its efforts toward emissions reductions. The City created the Climate Action Steering Committee in 2017 to provide input to City staff and the consulting team led by Elevate Energy during the development of the Climate Action Plan.

The Committee is comprised of 13 members – seven stakeholder representatives and five at-large community representatives. The represented stakeholders are the University of Iowa, Greater Iowa City Home Builders Association, Procter & Gamble Oral Care, MidAmerican Energy Company, Kirkwood Community College, Iowa City Area Chamber of Commerce, and a Certified Architect. The community representatives include a management consultant, architect, University of Iowa professors of Engineering and Geographical & Sustainability Sciences, an urban planner, and a University of Iowa student. This diverse representation brought together perspectives from those likely to lead climate action initiatives and those likely to be impacted by climate action efforts.

The Climate Action Committee met with the City and consultants throughout the last year's plan development process. These discussions provided critical input, perspective, and expertise in determining the content of the plan. We also held two community meetings to gather public input on the actions proposed in the Plan. As stated in our vision for the Climate Action Plan, our goal is to create a more resilient, equitable, and livable Iowa City for all. There are 35 proposed actions, which will provide a diverse array of options for the City, local business and industry, and individuals to make a difference.

We are honored to have been chosen to serve the Iowa City community during the Climate Action Plan development, and we are eager to help Iowa City move toward achieving its goals during implementation of the proposed actions. We are at the beginning of what we hope will be a robust, community-wide effort to effect positive change.

Sincerely,

City of Iowa City Climate Action Committee
Ingrid Anderson, GT Karr, Katie Sarsfield, Jesse Leckband, Liz Maas, Ryan Sempf, Matt Krieger, John Fraser, Martha Norbeck, Charlie Stanier, Eric Tate, Anne Russett, Eden DeWald

Executive Summary

The Iowa City community is ready to respond to the challenges of climate change. Iowa City has, and will continue to be impacted by the effects of greenhouse gas increases in the global atmosphere produced by fossil fuel use and other human activities related to lifestyle choices. In the last several years, Iowa City has experienced increases in flood magnitude and frequency, intense precipitation events, warmer temperatures, strong winds and changes in plant communities. Experts predict these changes will continue and likely intensify as levels of emissions continue to increase.

This Climate Action and Adaptation Plan for the City of Iowa City outlines thirty-five actions to be taken by the community and City which will result in an 80 percent reduction of community-wide greenhouse gas emissions by 2050. Implementing these actions will allow Iowa City to adapt to climate change and remain a resilient, healthy community, for current residents and for future generations. Additionally, actions outlined in the plan reflect local responsibility toward reducing the causes of global climate change and its negative affects around the world, and to do so in an equitable manner.

Actions in the plan were chosen because they were locally relevant and the most impactful choices to achieve a short-term 26 to 28 percent greenhouse gas reduction goal by 2025 and an 80 percent reduction goal by 2050. The actions will help position Iowa City as a national leader in sustainable practices, which can be used to maintain and drive economic development. Actions are organized into three traditional emission-producing categories, a category on adapting to climate change, and a section on personal lifestyle changes:

- **Buildings**
- **Transportation**
- **Waste**
- **Adaptation**
- **Sustainable Lifestyle**

A number of actions are already being implemented, and other complementary actions can be undertaken immediately and will have cumulative effects. Some actions will require a longer timeframe to implement. Actions specific to climate adaptation are included in this report, but a separate Vulnerability Assessment and Climate Adaptation report contains more comprehensive details on risk-based adaptation measures.

This plan will be most useful and effective if our community works together to reach the proposed goals. Partnerships and collaboration are essential in this effort to establish a new “business as usual” mindset which regularly reinforces behavior, innovation, and action that furthers achievement of these climate goals. Partnerships are necessary to represent, consider, and include all people across Iowa City in a fair and just manner, and provide tools and information that incentivize broad participation. Significant emphasis will be placed upon reaching and connecting with a diversity of populations in Iowa City to ensure that engagement, education, and concerns are addressed equitably.

We have already seen a significant decrease in our greenhouse gas emissions over the past few years with MidAmerican Energy’s commitment to renewable electricity and from the University of Iowa’s replacement of coal with biofuels in their power plant. Their efforts provide Iowa City with a unique head start; however, the collective action of our entire community will be needed to achieve our ambitious greenhouse gas reduction goals by 2050.

The completion of this plan does not mark an endpoint, but rather the beginning of a long-term effort. Plan progress should be monitored and evaluated regularly, and this document should be updated as technologies, economic conditions, and demographics change. In order to implement and move the plan forward, ongoing collaborations and community effort are essential. Implementing this plan will put Iowa City at the forefront of Midwestern cities mitigating and preparing for the effects of climate change.

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Introduction

Iowa City: Leading by Example

Climate change is experienced by all. Effects will range from minor, like seasonal comfort levels or a longer allergy season, to major, such as property damage, weakened infrastructure, disruption of essential services, and increases in public health issues like asthma. These impacts have the potential to affect some populations more adversely than others.

The time is now for Iowa City to act. The City has demonstrated its longstanding commitment to addressing climate change in tandem with partners across the nation, including the Urban Sustainability Directors Network. Iowa City signed the Global Covenant of Mayors and has been working on the requirements for compliance of the program. Those who live, work, and play in Iowa City are invited to join together to meet this transformative opportunity.

Iowa City's Climate Action Goal

On December 16, 2016, the Iowa City City Council formally resolved to reduce 2005-level greenhouse gas (GHG) emissions by 26 to 28 percent by 2025, and 80 percent by 2050, matching the U.S. commitment to the Paris Climate Agreement prior to the 2017 discussion of withdrawal. The establishment of an official goal by the current City Council represented nearly a decade of work by City staff and varying commitments by City leadership.

Understanding the Climate Future of Iowa City

In 2017, the announcement of the United States' desire to withdraw from the Paris Climate Agreement shifted the responsibility of action and innovation in climate change mitigation from national agencies to cities. Cities have been at the forefront of climate action and will continue to lead the way. Iowa City is among those cities that have risen to the challenge. As evidenced through collaborative efforts across communities and sectors, there is a determination in Iowa City to identify, address, and to the degree possible, prevent the negative impacts of climate change.

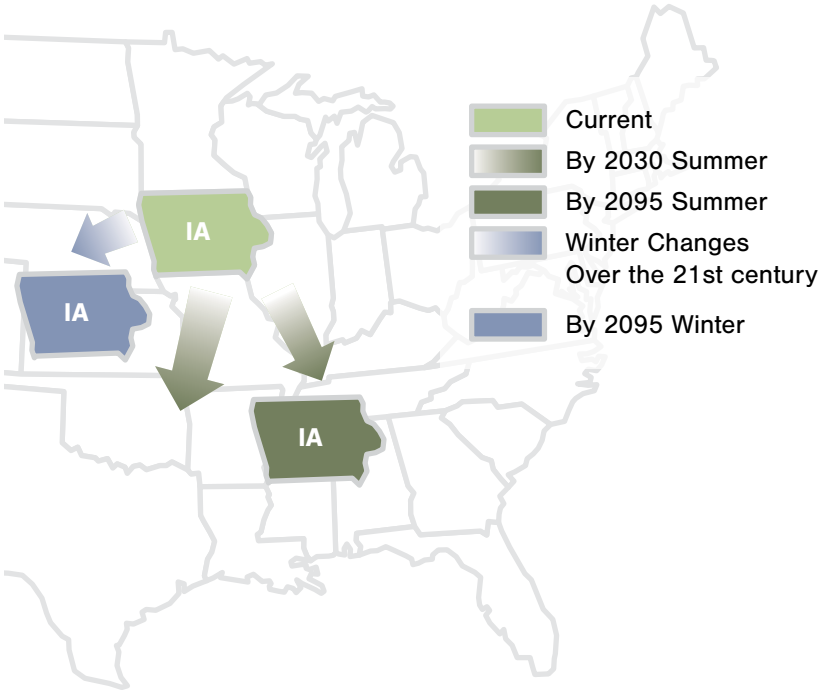
Decades of scientific research have concluded that human activities are changing the global climate. Average temperatures worldwide have risen since

Iowa City: Leading by Example *continued*

the last century and particularly so in the most recent few decades: 2017 was the third hottest year on record and nine of the top ten hottest years occurred after 2005. Other changes are being seen in the oceans: oceanic temperatures hit their third highest temperature ever in 2017 and annual precipitation has increased globally each decade since 1901.[1, 2]

In Iowa, similar trends have recently been observed. Climate change is causing more frequent hot summers and warm falls, more precipitation in general, and more frequent hazardous weather events like heat waves, storms, and floods.[3] Iowa City has experienced multiple, large flood events in the last decade. Consistent higher temperatures, combined with precipitation, are leading to increased soil erosion, and the creation of a more favorable environment for pathogens and pests that could ultimately threaten public health. Experts believe that the results of changing climate will make Iowa City summers feel more like those traditionally experienced in our southern states (Figure1).[4] Beyond the next decade, projected annual temperatures are expected to increase so much that the 30-year average temperature in the future will fall above the hottest years of the normal historical temperature range (Figure 2). Annual precipitation is expected to increase 10 percent by 2021 to 2050, and another 5 percent by 2051 to 2080 (Figure 3).[5]

Figure 1. Climate change will be most noticeable in Iowa City's summer weather



Scientific consensus is clear: GHGs generated by human activity are the primary cause of climate change. In fact, 97 percent of actively publishing climate scientists agree that the acceleration of climate change over the last several decades is primarily caused by increased GHG emissions due to human activities.[6] Decisions on how to power buildings, move around cities, transport products, and manage waste all have an impact on the amount of GHGs released. Due to the impact on global and local weather patterns, and the

A STAR Community

In 2016, Iowa City was certified as a 4-STAR Community by the STAR (Sustainability Tools for Assessing and Rating Communities) Community Rating System. The STAR framework is the nation's leading certification program for community-based local sustainability. The City scored relatively high in five of the seven categories, but earned its lowest score in Climate and Energy. Improvement in this area is further impetus for this plan. Iowa City is one of five cities across the state that has achieved a rating, and according to STAR Communities, it ranks highest among its Iowa peers.

Iowa City: Leading by Example *continued*

potential repercussions to the environment, health, economy and lifestyles, reducing GHG emissions has become a serious matter, not just for the planet, but for Iowa City as well.

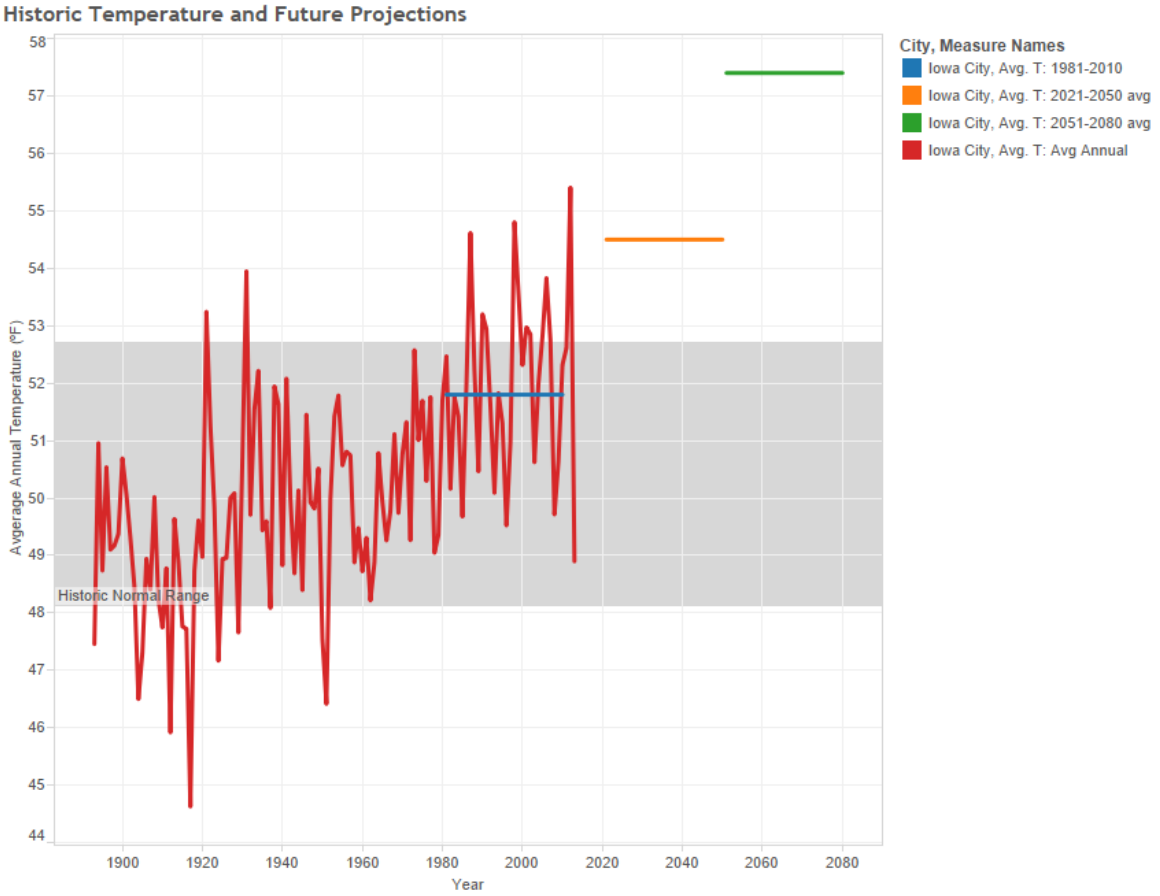
It is also necessary to acknowledge that changes in climate are already happening. It is prudent and cost effective to adapt to them and prepare for additional changes, such as more extreme heat waves and other extreme weather events. A resilient city must plan for these eventualities and take action against the effects of climate change.

The Path to Climate Action

During the mid-2000s, there was a growing global awareness of the impact of rising GHG emissions around the world. The collective voice of concern was led by both national and international organizations, with most offering education and training opportunities, a united voice of support, and a pathway to guide initial action in communities. Some of the country's biggest cities initiated action, influencing smaller communities to do the same.

In 2007, as part of the U.S. Conference of Mayors, Iowa City signed the Mayors Climate Protection Agreement, signaling Iowa City's first commitment to reducing GHG emissions. A year later, Iowa City joined the Cities for Climate Protection Campaign (CCP), a program initiated by the International Council for Local Environmental Initiatives (ICLEI), (Figure 4). The basis of participating in the CCP was a commitment to reaching five milestones: conduct an emissions inventory, adopt a reduction target, develop a plan, implement the plan, and monitor progress. In August 2009, Iowa City achieved a major milestone and became the first city in Iowa to complete a community-wide GHG inventory. Since then, community-wide emissions data has been updated each year to track progress and note trends.

Figure 2. Iowa City temperatures have been rising since the 1950s and are projected to continue this trend



SOURCE: Heartland Regional Network of the Urban Sustainability Directors Network (2015) *Climate in the Heartland*

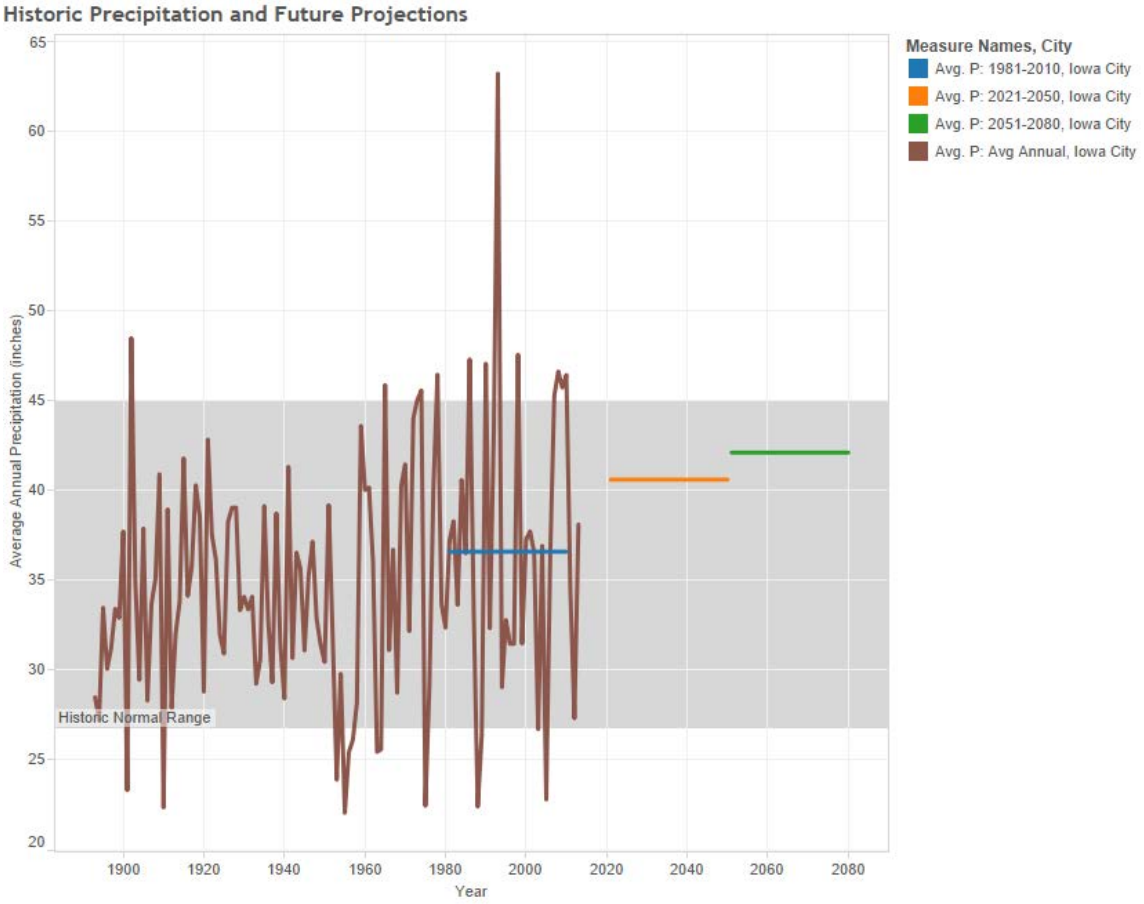
In 2014, the Compact of Mayors was established at the United Nations Climate Summit in New York City. The Compact of Mayors[7] was, at that point, the biggest collaboration to accelerate climate action in cities across the world, and was signed by 447 cities, representing 390,761,581 people worldwide—over 5 percent of the total global population.[8] Iowa City affirmed its previous commitment by signing the Compact in February 2016. This commitment

Iowa City: Leading by Example *continued*

established a three-year progressive path to address mitigation and adaptation. It is the culmination of this process that led to the development of this document—The Iowa City Climate Action and Adaptation Plan.

Even before this Plan was conceived, the City completed two comprehensive community-wide GHG inventory reports and two municipal inventory reports, made energy efficiency improvements in a number of municipal buildings, and invested in high energy efficiency systems at four facilities. For several years, City departments and various stakeholders have been working in unison to put together other plans, projects, and policies that connect to climate work. Some examples include the City's recently adopted Strategic Plan in March 2018, the Iowa City Bicycle Master Plan, the City's ordinance-supported commitment to increasing social equity, the Johnson County Multi-Jurisdictional Hazard Mitigation Plan, the Johnson County Long Range Transportation Plan, and the University of Iowa Sustainability Plan.

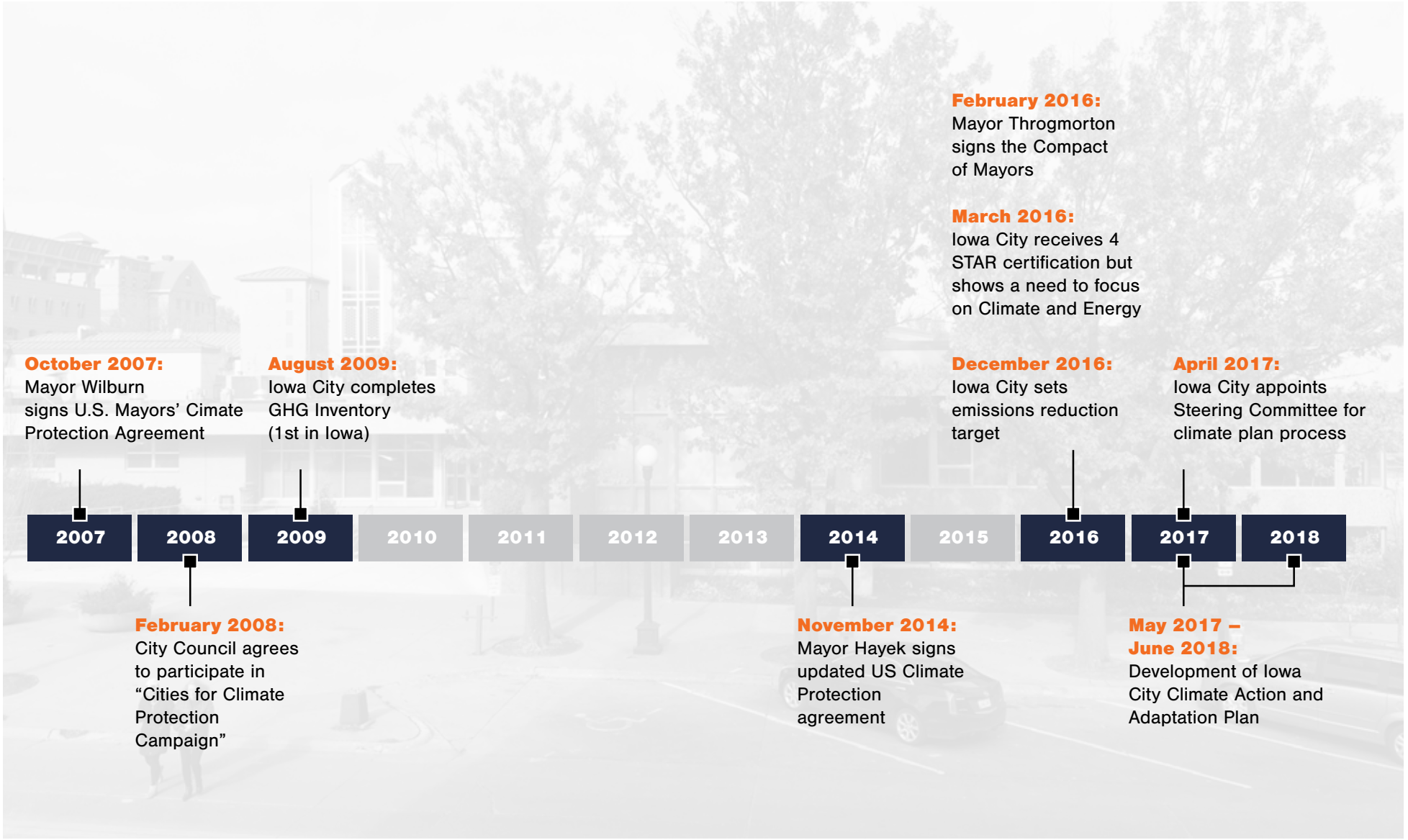
Figure 3. Iowa City precipitation has been rising and future projections will continue trending upward



SOURCE: Heartland Regional Network of the Urban Sustainability Directors Network (2015) *Climate in the Heartland*

Iowa City: Leading by Example *continued*

Figure 4. Timeline showing Iowa City's commitment to climate work for over a decade



Greenhouse Gas Inventory

Iowa City Baseline

In 2009, Iowa City completed its first comprehensive community-wide GHG inventory report. Since 2008, community-wide emissions data has been compiled annually with the latest update released in the summer of 2017 for 2015 emissions produced by all sectors within the city limits of Iowa City.[9] The GPC protocol was used for the 2015 inventory and all past years were updated using this methodology.

In 2015, Iowa City generated 987,735 metric tonnes of CO2e (carbon dioxide equivalent), which already shows a 23 percent reduction from the estimated 2005 baseline (Figure 5). This achievement was primarily the result of MidAmerican Energy's shift to more renewable wind energy production for electricity, as well as the increased use of biomass at the University of Iowa Power Plant.

Figure 6 shows that the bulk of community-wide emissions in Iowa City result from the fuel used to generate electricity (42 percent). Natural gas use for heat and electricity is the second largest source of community-wide emissions (26 percent), followed by coal used to operate the University of Iowa Power Plant (15 percent), and then transportation (15 percent). Waste only accounted for 2 percent of the community-wide total.

In addition to the community-wide inventory, the City evaluated the carbon footprint resulting from its own municipal operations. In 2015, City government operations generated 44,194 metric tonnes of CO2e, which is roughly 4.7 percent of the community total (Figure 7).[10] Over half of all the municipal emissions (54.3 percent) were a direct result of organic waste decomposing in the Iowa City Landfill, which is owned and operated by the City but serves all of Johnson County, while wastewater treatment generated an additional 15 percent, and buildings and facilities generated 12 percent.

Figure 5. Iowa City Community total annual emissions, 2005-2015, and emission reduction targets

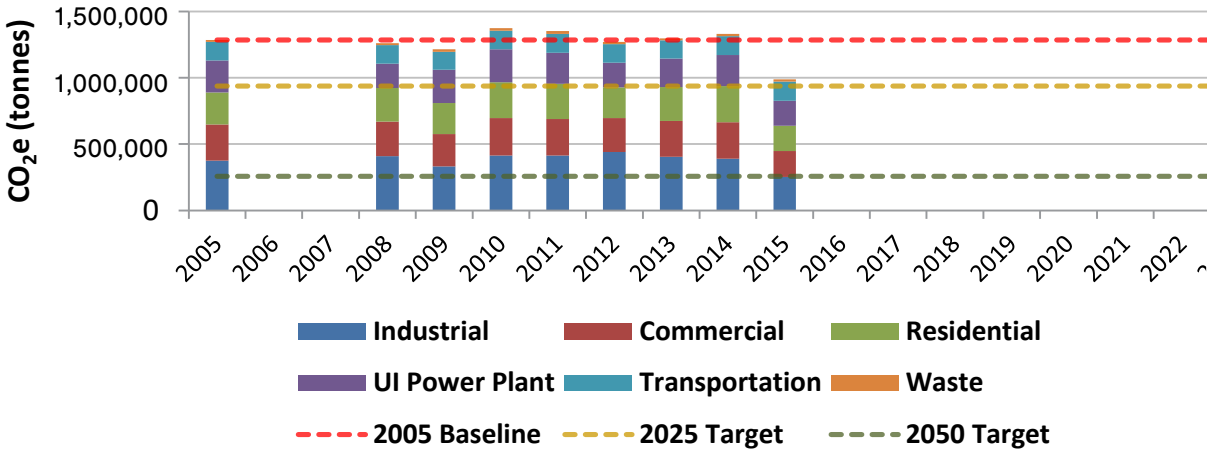


Figure 6. Iowa City Community CO_2e totals by source, 2015

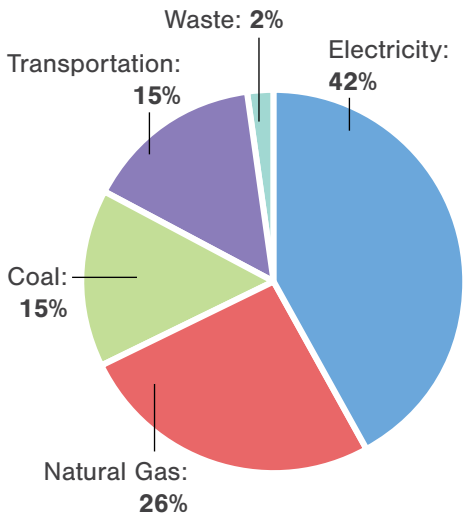
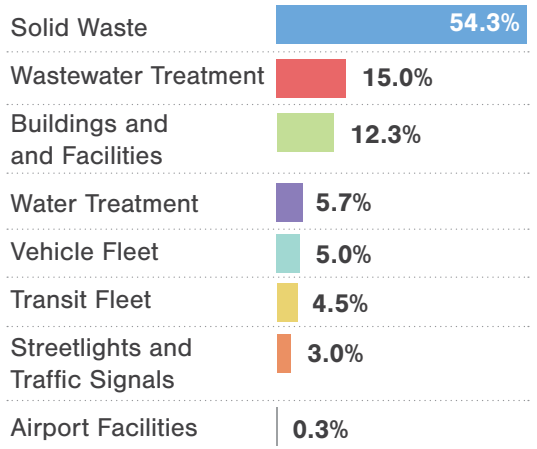


Figure 7. 2015 Municipal operations CO_2e emissions by sector



Note: Solid Waste emissions (54.3 percent) reflect waste that is produced by all of Johnson County

Feature

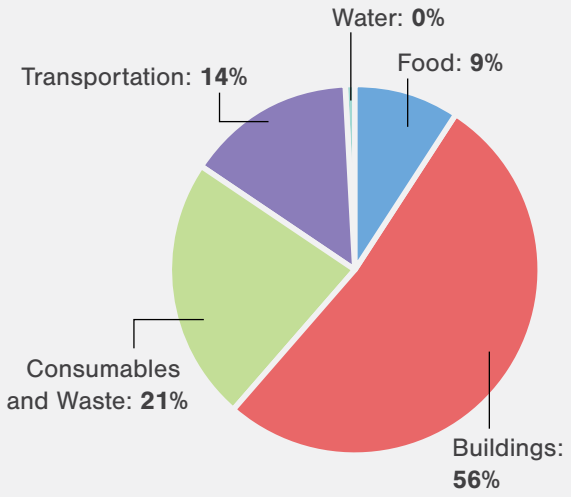
Consumption-Based Emissions Inventory

In 2017, Iowa City received a grant from the Urban Sustainability Directors Network to pilot a tool that has been successfully used in Vancouver, Canada to create a consumption-based emissions inventory (CBEI).[11] Iowa City is one of the first cities in the U.S. to look at this more comprehensive way of identifying the true emissions for its community.

Consumption-based emissions inventories are unique in that they provide a more complete picture of the community's impacts by accounting not only for locally generated emissions, but also the emissions associated with the production and transportation of materials and food consumed by Iowa City residents. In this way, these inventories can demonstrate the scale at which consumption-related emissions are being off-loaded to other jurisdictions, and with this in mind, Iowa City can incorporate strategies and actions that maximize global, and not just local, emission reductions.

The CBEI showed that in 2015, total GHG emissions for Iowa City were 1,182,000 metric tonnes of CO_2e[12] and footprint was 6.7 global hectares (gha)[13] per capita. Based on current global population and biological productivity levels, an average of 1.7 global hectares is available for each person on the planet, which means Iowa City residents are consuming per capita four times more of the earth's resources than what is currently available.[14] It is important to note that, in both the CBEI and the standard Community Greenhouse Gas Inventory, the highest emitting category is the energy consumed in buildings. A copy of the Iowa City Consumption Based Inventory is available at www.icgov.org/climateactionreports.

Figure 8. Consumption-based greenhouse gas emissions for Iowa City



Plan Development

Our Vision

Iowa City will take immediate action to embrace opportunities, address challenges, and respond to the realities of climate change. Our efforts will reach our entire community using proactive and collaborative strategies, including community engagement, local partnerships, and technological advancements to reduce GHG emissions and spur economic growth. Our goal is to create a more resilient, equitable, and livable Iowa City for all.

The Process

With the emission reduction goals of 26 to 28 percent for the year 2025, and 80 percent by 2050 approved by the City Council, it becomes necessary to develop a plan that provides a framework for reducing GHG emissions while increasing the ability of Iowa City to prepare for a changing climate. The journey to develop the Iowa City Climate Action and Adaptation Plan (Plan) began in May 2017 when a Steering Committee was formed to oversee its creation and a consultant team was selected to assist the City in its development.

Between June 2017 and June 2018, the Steering Committee, consisting of 13 members who represent Iowa City's diverse community, met as a group eight times. Members reviewed Iowa City's GHG emissions inventory, provided input into the development of a vision statement, developed actions to meet reduction goals, crafted strategies for public engagement, reviewed public input, and offered overall direction. Steering Committee members also organized into subcommittees to help tackle various aspects related to Plan development. For instance, a Draft Review Subcommittee took on the task of reviewing versions of the final Plan. The Equity Subcommittee was formed to review all actions through an equity lens that ensures the inclusion and input of all communities and the fair distribution of benefits. An Outreach Subcommittee was also formed to help identify opportunities for community outreach and engagement, and an Adaptation Subcommittee was tasked with advising the development of actions that touch upon adaptation issues.

A key element of this Plan was involvement from the community. On November 2, 2017, the City hosted Community Meeting #1 with about 100 people in attendance. During the meeting, attendees voted on

strategies they thought should be included as part of the Plan. In addition, the City deployed a survey in early 2018 to gather further input and help the City understand community perspectives. The survey was completed by approximately 800 individuals and is described in a later section of this Plan with the full survey results in Appendix 3.

Guiding Principles

As Iowa City's climate changes, the impacts will affect some people more adversely than others. The ability to act quickly during emergency events will amplify vulnerabilities that currently exist for cost-burdened households, people with mobility issues, or households with language barriers. These populations potentially face additional adversity due to a variety of pre-existing conditions. According to the Urban Sustainability Directors Network, "climate risk is a function of exposure to natural hazards, sensitivity to these hazards, and the ability to adapt. Systemic and institutional racism and classism have resulted in increased exposure and sensitivity to hazards and a reduced capacity to adapt among people of color, immigrants, refugees, and lower-income residents, often referred to as frontline communities."[15]

It is important that one result of the Plan is that it prepares everyone—not just some people—for successfully coping with and adapting to a changing climate, while simultaneously reducing our emissions. The Plan is organized by both simple and complex actions to take with respect to buildings, transportation, and waste, as well as next steps towards adaptation and the adoption of a more sustainable lifestyle.

Climate Change in the Context of Sustainability

Addressing climate change is an important part of ensuring a sustainable future, and while this Plan is primarily oriented toward reducing GHG emissions, we recognize the opportunity to also address other environmental and social issues. In addition to those directly associated with reduced GHG emissions, many of the actions that will help mitigate climate change also provide multiple benefits, such as cleaner air and water, enhanced biodiversity, healthier and more livable communities, increased economic development, new job opportunities, and increased social equity. With this in mind, a plan has been developed that incorporates sustainability as an overarching consideration for all actions and ensures that actions recognize resource efficiency above all, and avoids shifting emissions or negative impacts outside of Iowa City.

Collaborative Partnerships

We must all work together to achieve our emission reduction goals. The City's limited direct influence on GHG emissions will require the development of collaborative partnerships with other jurisdictions, businesses, industry, and community-based organizations to ensure that all parties are moving in the same direction and that change is driven from the top, as well as at the grassroots level. Personal engagement and contributions from residents will be critical to ensure success.

Economic Development

The actions that the City will undertake as part of this Plan were strategically selected because of their capacity to help build a strong local economy. Our aim is that these actions will create job opportunities by supporting existing local businesses and expanding investment to jobs that relate to the actions discussed in this document. Many of the proposed actions will also help reduce costs for our residents and businesses. For example, avoiding the wasteful use of energy and other resources will make available more dollars to be reinvested in the local economy and stabilize household costs. Finally, we believe that these actions can attract business and industry investment, more job opportunities, and new residents to the community by creating a clean and safe city with modern infrastructure and a high quality of life that makes the City an even more desirable place to work and live.

Social Equity

The City of Iowa City is committed to promoting equity within the community, while leveraging the strength of Iowa City's diverse backgrounds and experiences. A key consideration of the climate action approach is to ensure that access and participation are inclusive of all people and that the actions to be implemented encourage more equitable solutions. Iowa City may be able to address a variety of social challenges that we face by reviewing these climate change actions under a lens of equity and social justice principles. For example, reduced poverty, improved connectivity of neighborhoods and public transportation, strengthened housing infrastructure, decreased economic concerns

Guiding Principles *continued*

for cost-burdened households, and reductions in unemployment might be achievable if this community assesses and mitigates the potential inequities of these actions. If evaluated and acted upon responsibly, the City's actions should help foster a more inclusive, just, and sustainable Iowa City, while ensuring that all can share the benefits.

Promote Resilience and Adaptation

It is crucial to recognize the changes that the community is experiencing and develop risk management strategies that help prepare for future local climate impacts. Therefore, a category of actions is dedicated to adaptation, including preparation for increased temperatures and more intense rainfall and storms. Resilient infrastructure plays a big part in our consideration of adaptation techniques, but the City's emergency planning and response protocols, as well as the individual behaviors of community members, must be considered. The City's resilience efforts should also focus on areas and populations that are most vulnerable to the impacts of climate change.

The City's Leadership

As part of our shared collaborative efforts, the City will lead the way by setting an example in reducing GHG emissions from its own operations, as well as by facilitating action within the community. By leveraging existing programs and focusing on high-priority initiatives, we will not only be able to reduce our emissions, but also conserve valuable resources such as energy and water, while saving money and promoting a culture of action. Beyond initiatives undertaken within our geographical limits, Iowa City is committed to continued leadership in our state and country by supporting initiatives that will result in a more sustainable world for all.

Moving Forward

This Plan serves as a roadmap for how Iowa City will reduce GHG emissions and create a healthier, cleaner, and more sustainable community that is equipped to handle climate impacts already observed in Iowa City.

Thirty-five actions have been identified as those that will help Iowa City reach its emission reduction goals. In selecting these actions, the plan development team first looked at the quantity and source of the City's emissions by evaluating the most recent community-wide inventories. Then, numerous emission-reduction ideas were evaluated for their feasibility, cost-effectiveness, ease of implementation, and the extent to which each action contributed co-benefits related to health, equity, economic development, and overall quality of life. In addition, local assets and available resources were identified to understand how they assist with implementation. Best practices and observation of efforts with proven success in other cities in the U.S. and around the world were analyzed for their applicability given the context of our built environment, local culture, and existing policies. Finally, the actions presented in this plan were arrived at with the input of the consultant team, City staff, and the Steering Committee.

An important consideration in the development of the actions was the recognition of the noteworthy commitments made by the City's electricity service providers and the University of Iowa to shift a significant portion of electricity generation to renewable energy sources. Given that electricity is the largest source of Iowa City's emissions (42 percent), MidAmerican's commitment to 100 percent renewable electrical energy by the end of 2020 will significantly reduce emissions and move Iowa City closer towards the goal; however, additional actions to reduce emissions will be required. With a decarbonized source of electricity, it makes sense for Iowa City residents to pursue actions that will result in additional electrification of systems, such as transitioning from gas-powered water heating to electric heat sources. In addition, the City needs to focus attention on other significant sources of emissions, such as transportation and natural gas consumption. As a result, several actions and objectives will address these sectors in a targeted way.

Some of the actions presented in this Plan directly address municipal operations through "lead by example" initiatives. These actions include increasing the efficiency of public buildings, exploring ways to make water and wastewater operations less energy-intensive, greening the City's municipal fleet by replacing gasoline-fuel vehicles with cleaner options or improving fuel efficiency, and exploring options for recovery and use of methane generated by the landfill and the wastewater facility. The City has direct control over less than 5 percent of the total community emissions, therefore it is important to note that other actions were developed to establish cooperative partnerships to pursue multi-sector solutions.

Ultimately, the Plan presents a broad range of actions, some of which are specific and others which require further investigation; in some cases, a funding source must be identified. These actions cover a variety of implementation approaches that include partnership building, policy changes, education and awareness, pilot projects, lifestyle changes, and development of new programs.

Taking Action: How to Use This Plan

Actions are organized by the following areas that represent where the community can make an impact, while recognizing that some actions cut across sectors to deliver multiple benefits:

Buildings **Transportation** **Waste** **Adaptation** **Sustainable Lifestyle**

Each of these areas is described in a separate section with background information included on the current status of the issue and Iowa City's efforts. In the beginning of each section, there is a short list of equity considerations that should be reflected upon and addressed during the ongoing implementation of each action. Further, many actions tend to offer additional benefits to Iowa Citians. These co-benefits are highlighted by the following icons in each section:

Reduced costs **Improved health** **Cleaner environment** **Job growth opportunities** **Resilience/ability to adapt** **Increased engagement/ awareness**

In addition, each individual action is coded to describe whether action is needed at home, at work, at the government level, or a combination of these. This icon signals to residents, businesses, and community-based organizations where they can take action and what programs, education, and support the City may lead. At the end of each section, readers will also find suggestions for individual action and participation. Finally, the City has developed a Climate Action Toolkit as a companion to the Plan. The Toolkit includes information, materials, checklists, and links to several valuable resources, and serves as a resource guide to inspire residents, businesses, schools, and community-based organizations to take an active role in the shared objective of reducing the City's GHG emissions. The Toolkit can be found online at www.icgov.org/climateaction.

While it is not possible to predict the future with certainty, the information that is available on technology improvements and policy trends has been used to attempt to look beyond the initial emissions reduction goal of 2025 and to identify what additional actions will be needed to reach the more aggressive 2050 goals.

Summary of Actions

The table below is a snapshot of the 35 actions described in this plan. An expanded table that includes implementation period, proposed lead agency, and co-benefits can be found in Appendix 2. Actions marked with a star (✪) are ***high priority action items*** that are crucial to either reaching the City's emissions goal and/or have the ability to incentivize the widespread behavior change that is necessary to facilitate and support long term action, and thus imperative to reaching emissions reduction targets.

	Action	Sector(s)	Cost	Local GHG Impact
	Buildings			
1.1	✪ Increase energy efficiency in residences	**Home** Work Government	$-$$$	▬▬▬
1.2	✪ Increase energy efficiency in businesses	Home **Work** Government	$-$$$	▬▬▬
1.3	✪ Increase energy efficiency in new buildings	**Home** **Work** **Government**	$	▬▬▬
1.4	✪ Increase on-site renewable energy systems and electrification	**Home** **Work** **Government**	$$	▬▬▬
1.5	Initiate community solar projects[1]	**Home** **Work** Government	$$$	▬
1.6	Support energy benchmarking tools	**Home** **Work** **Government**	$	▬
1.7	✪ Continue to increase energy efficiency in City-owned buildings[2]	Home Work **Government**	$-$$$	▬
	Transportation			
2.1	✪ Increase use of public transit systems	**Home** **Work** **Government**	$-$$$	▬▬
2.2	✪ Embrace electric vehicles, alternative fuel vehicles, and other emerging technologies	**Home** **Work** **Government**	$$	▬▬▬
2.3	✪ Increase bicycle and pedestrian transportation	**Home** **Work** **Government**	$	▬▬
2.4	✪ Increase compact and contiguous development	Home Work **Government**	$$	▬
2.5	✪ Increase employee commuter options	Home **Work** Government	$	▬▬▬
2.6	Manage parking options	Home **Work** **Government**	$$	▬
2.7	Reduce the City's vehicle emissions footprint[2]	Home Work **Government**	$$	▬

Summary of Actions *continued*

	Action	Sector(s)	Cost	Local GHG Impact
	Waste			
3.1	Increase recycling at multi-family properties	**Home** Work **Government**	$	▬
3.2	Increase composting of organics	**Home** **Work** **Government**	$	▬
3.3	✪ Reduce waste at the source	**Home** **Work** Government	$	▬
3.4	Establish partnerships to divert construction waste from the Landfill	Home **Work** **Government**	$$	▬
3.5	Reduce waste at City facilities[2]	Home Work **Government**	$	▬
3.6	Create a comprehensive waste management plan	Home Work **Government**	$	▬
3.7	✪ Take action on a study to efficiently capture and use methane from wastewater operations	Home Work **Government**	$	▬
3.8	✪ Take action on a feasibility study on energy generation from landfill methane	Home Work **Government**	$$$	▬ ▬
	Adaptation			
4.1	Conduct a vulnerable populations asset mapping exercise	Home Work **Government**	$	▬
4.2	✪ Develop communications and outreach plan for vulnerable populations	Home Work **Government**	$	▬
4.3	Analyze climate-related public health impacts in Iowa City	Home Work **Government**	$	▬
4.4	✪ Coordinate extreme weather preparedness planning with local agencies	Home Work **Government**	$	▬
4.5	Assess Citywide and neighborhood stormwater management	Home Work **Government**	$	▬
4.6	Expand Iowa City's tree canopy	Home Work **Government**	$$	▬

Summary of Actions *continued*

	Action	Sector(s)	Cost	Local GHG Impact
	Sustainable Lifestyle			
5.1	✪ Encourage a plant-rich diet[3]	**Home** Work Government	$	▬ ▬ ▬
5.2	Expand community gardens and access to healthy, local foods	**Home** Work **Government**	$$	▬
5.3	Encourage the purchase of local products and responsible purchasing	**Home** **Work** **Government**	$	▬
5.4	✪ Create funding mechanisms to support community-wide climate action	Home Work **Government**	$$$	▬
5.5	✪ Incorporate this Climate Plan into the City's sustainability communications	Home Work **Government**	$	▬
5.6	Initiate a green recognition program	**Home** **Work** **Government**	$	▬
5.7	Develop internal City sustainability operations guide	Home Work **Government**	$	▬

Table notes and definitions:

Action: Description of proposed strategy or action.

Sector: The type of building or individual where the action can be implemented; residential, business or city government

Cost: The comparative cost of implementing each action on a scale of $ through $$$. Note that the costs can be borne by a variety of stakeholders.

Impact: The comparative emissions impact on Iowa City emissions that result from the implementation of each action on a scale of * through *** rating. Impact ratings are ranked in their ability to reduce Iowa City GHG emissions based on the 2015 Iowa City Community-wide Greenhouse Gas Inventory.

1. Iowa City's electricity source will be 100 percent renewable; therefore, the actual emissions reduction for community solar activities will be minimal.
2. The impact of city government buildings, vehicle fleet, and waste reduction activities as separate actions are minimal on Iowa City's community-wide emissions profile, although the City strongly believes in leading by example and taking action, just like others in the community. The incremental actions of each individual person, business, and organization will allow us to achieve our overall community-wide targets.
3. While the immediate impact on emissions in Iowa City may be relatively small, the global impacts related to eating more plants and less meat result in a very high impact.

Meeting our Targets

Below are two charts that depict how the fully implemented actions will result in Iowa City reaching its emissions reduction goals in 2025 and 2050. On both charts, Iowa City's baseline emissions from 2015 are shown on the left, in blue. On the far right is the emissions reduction target for said year (2025 or 2050), in green. On the first chart, it was necessary to also account for the incremental growth in emissions through 2025, which is represented by the second blue block. Finally, all of the potential for emissions reductions are shown in red. Iowa City is very close to its 2025 goal now, largely due to MidAmerican's strong commitment to renewable electricity—the first red block. The second red block represents the University of Iowa's power plant fuel switch. Very incremental actions from Buildings, Transportation, and Waste will be required to make the final push to meet the 2025 goal.

It is important to note that most cities across America do not have the boost that the MidAmerican and UI's commitments provide. This is a huge advantage for Iowa City. However, despite the magnitude of these renewable energy commitments, relying on these alone is not enough to help Iowa City reach its deeper emission goals in 2050.

Looking further out, Iowa City can also reach its goals to reduce emissions by 80 percent as shown in the 2050 chart. Like the last chart, all the emissions reductions are in red. While we see the influence of MidAmerican, and the University of Iowa, there must be a push to implement actions outlined in this plan for Iowa City to reach its ambitious but achievable emissions reduction targets.

Figure 9A. 2025 GHG Emissions MTC0₂e

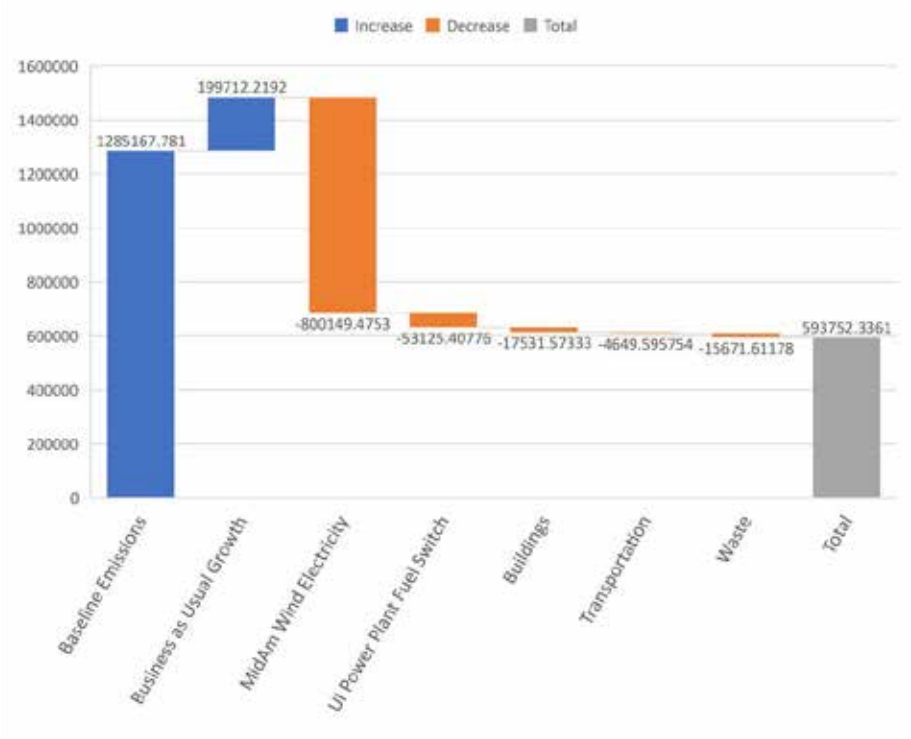
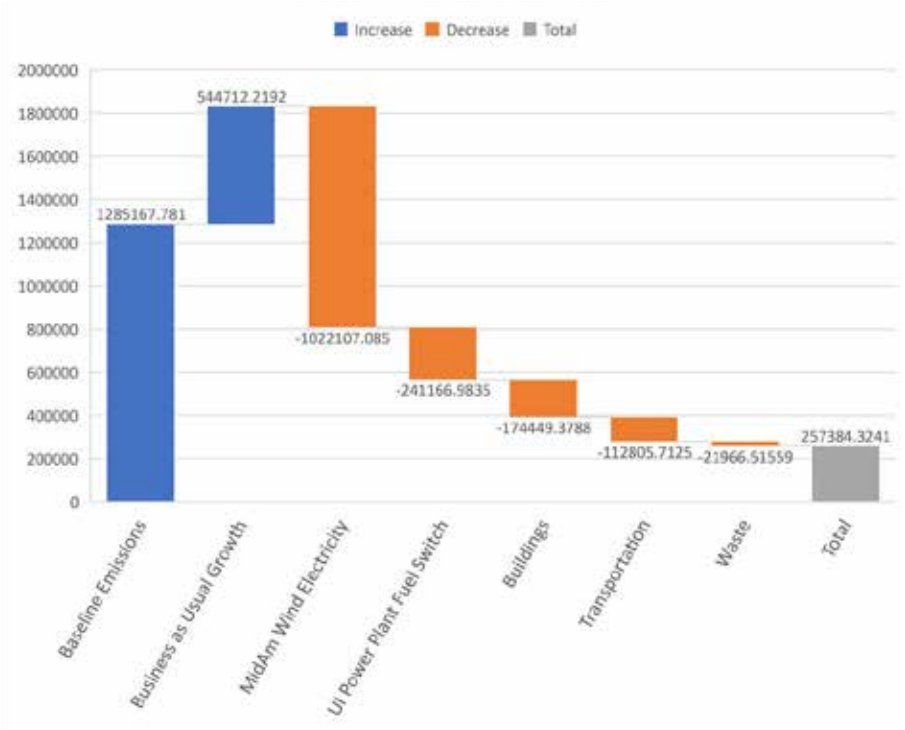


Figure 9B. 2050 GHG Emissions MTC0₂e



Partners' Commitments to Renewable Energy

The electricity sector is the greatest contributor to GHG emissions. Because of this, one of the most critical strategies to help Iowa City meet its goals is the generation of electricity from carbon-free or less carbon-intensive fuel sources. Thankfully, the electric service providers and the University of Iowa have seen the opportunity and have made considerable commitments to increase the generation of renewable energy and the displacement of carbon-based fuels.

MidAmerican Energy's vision is to produce enough renewable electricity each year to equal 100 percent of its Iowa customers' usage. On May 30, 2018, MidAmerican filed a proposal with the Iowa Utilities Board for the Wind XII project, which would include up to 591 megawatts of additional wind generation. If approved by the Iowa Utilities Board, MidAmerican projects its annual renewable energy generation, as calculated under the MidAmerican Energy GreenAdvantage® program, to exceed 100 percent of Iowa retail customers' annual energy usage in 2021, the first full year all of Wind XII is in service.[16] MidAmerican's GreenAdvantage® program is a verification of the amount of renewable energy they provide to customers on an annual basis. The program is based on rules adopted by the Iowa Utilities Board to establish a recognizable and trusted process for verification of the percentage of renewable energy a utility provides on an annual basis. Each year, MidAmerican plans to file for verification of its renewable percentage and communicate that percentage to customers for them to use in meeting their sustainability goals.

- While Eastern Iowa Light and Power provides a small portion (0.5 percent) of purchased electricity to Iowa City, they also state that almost 60 percent of their sources of energy are carbon-free with 24.8 percent wind/hydro and 34.5 percent nuclear energy supplying their electrical generation. Eastern Iowa Light and Power has also made plans for adding some solar installments in the next few years.
- The University of Iowa, through sustainability goals established in its 2020 Vision, has been working for several years to displace coal with biomass fuel sources in its solid fuel boilers at their main power plant. Due to the success of these efforts, in February 2017, the University committed to eliminating coal from its fuel portfolio by 2025.

Taking Action:

Buildings

Taking Action: Buildings

Targets:

- Existing Buildings: Retrofit 10 percent of all buildings by 2025 and 90 percent by 2050.
- New Buildings: Achieve 45 to 48 percent energy savings in new buildings due to code enforcement by 2025 and 80 percent energy savings by 2050 due to code enforcement and phased-in approach to net zero energy policies.
- Renewable Energy: Transition 3 percent of buildings with natural gas to high efficiency electrical heat, powered through low-carbon electricity sources by 2025 and 25 percent by 2050.

Background

Equity Considerations:

- Often, families that can least afford high-cost utility bills live in properties that are not energy efficient. These households may lack the ability to prioritize or pay for energy efficiency improvements or access renewable energy options.[17]
- Renters of multi-family housing do not have the same ability to implement and gain the benefits of energy efficiency as owners and residents of other forms of housing.

Co-Benefits:

Energy is something used every day, often without thinking about it. We turn on the light switch and expect lights to turn on. We heat and cool our homes, only pausing to think about what this means for our electricity or gas bill at the end of the month. Increased use of electric appliances and media/communications devices has drastically contributed to the rise in energy consumption within our buildings. We are plugged in now more than ever before with multiple televisions, small appliances, mobile phones, tablets, and computers that have significantly impacted how much energy we use on a daily basis.

Iowa City estimates that energy consumption in buildings accounts for 68 percent of community-wide emissions, or about 676,202 metric tonnes of

Background *continued*

CO_2e, making this the largest source of emissions. Individually, about 42 percent of emissions (419,757 metric tonnes CO_2e) come from electricity consumption and 26 percent (256,445 metric tonnes CO_2e) from natural gas consumption. Reducing energy consumption in buildings is critical to Iowa City's ability to achieve its goal of reducing emissions by 80 percent by 2050. Reduction takes form in two basic ways: using less energy overall through energy efficiency improvements and transitioning from fossil fuels to renewable energy sources, especially moving away from natural gas used in heating.

Implementing energy efficiency improvements and shifting our energy sources from natural gas to renewable energy, if done properly, can provide a variety of added benefits, including reduced cost, improved occupant comfort and productivity, and cleaner air and water. Energy efficiency measures can also help utilities avoid or delay the need for investment in new generation, transmission, and distribution capacity. This in turn helps keep electricity rates low.

Reducing energy consumption will require action on all fronts, meaning that reductions will need to come from existing buildings—most of which will still be standing in 2050—as well as new buildings. Tackling reductions in electricity and especially natural gas, which is used for space heating and hot water heating, is an important part of this plan. Finally, it will take participation from all building sectors, the involvement of many stakeholders with different roles, identification and facilitation of financial partners and incentives, and coordination and leadership by the City to comprehensively tackle inefficient energy use.

Older buildings typically have more opportunities for efficiency improvements compared to newer buildings due to changes in construction standards over time and the more recent inclusion of energy efficiency requirements in building codes. Older buildings are also more likely to have less efficient heating and cooling, lighting, and other systems in use. New construction is required to meet certain building and energy codes, and doing so when it is designed and built is far cheaper than retrofit work later. The City's current energy code meets the energy efficiency requirements laid out in the International Code Council's (ICC) model 2012 International Energy Conservation Code (IECC). Energy codes represent the first line of defense for assuring energy efficiency in new buildings, but code is only as strong as its enforcement. While these codes are efficient, some cities are examining net zero energy goals in which new buildings generate enough renewable energy onsite to handle the building's consumption needs. The City's role in reducing energy-related emissions is two-pronged. First, the City will lead by example

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Energy Efficiency Programs

Currently, both MidAmerican Energy and Eastern Iowa Light and Power offer numerous energy efficiency upgrade incentives to residential and commercial properties, and some of the City's existing home loan programs include energy efficiency measures. The State of Iowa also provides coordinating information on a variety of energy efficiency and renewable energy incentives as well. In May 2018, the State passed bill SF2311 which may result in significant changes for energy efficiency programs in Iowa by imposing a spending cap on efficiency programs by investor-owned utilities, while simultaneously allowing customers to opt out of paying for these programs.[18] While these incentive-based efficiency programs will still play a vital role in Iowa City's implementation efforts related to energy efficiency, the City will need to identify new partners who can offer other kinds of incentives for energy efficiency improvements.

Background *continued*

in reducing consumption and increasing reliance on renewable energy sources in its buildings. Most energy efficiency work to-date in City facilities includes installing efficient indoor and outdoor lighting and replacing older, inefficient heating and cooling systems. Iowa City employs high efficiency ground-source heat pumps for heating and cooling in four buildings: the Animal Care and Adoption Center, East Side Recycling Center, Fire Station #2, and Fire Station #4. Ground-sourced heat pumps have two important advantages: they do not utilize natural gas for cold-season heating, and they are more efficient than traditional air conditioning systems. In addition, whenever new municipal buildings or major renovations to existing City properties are in the development process, there is an assessment of the viability of renewable energy as means to reduce the building's reliance on fossil fuels.

Second, the City will work to facilitate the same standards for building owners and operators across the community. In a January 2018 Iowa City survey, 61 and 64 percent of the approximately 800 respondents indicated they would like to learn more about energy efficiency and renewable energy in buildings. These two choices were clear favorites among other topics of waste and transportation.

The seven building-related actions identified as part of this Plan build upon past progress, while leveraging existing programs, initiatives, and infrastructure. Together, these actions represent the largest opportunity for reducing emissions in Iowa City.

What is Net-Zero?

The U.S. Department of Energy defines a net-zero building as one that "produces enough renewable energy to meet its own annual energy consumption requirements, thereby reducing the use of non-renewable energy in the building sector. This definition also applies to campuses, (energy) portfolios, and communities."

Actions

1.1 Increase Energy Efficiency in Residences

Residents can reduce energy consumption in homes across Iowa City—from single family homes to apartments in multi-family buildings—through a more comprehensive approach to energy efficiency, including air sealing and insulation, efficient heating and cooling equipment, replacement of gas appliances with electric, and "quick fixes" like programmable thermostats, efficient lighting, and smart power strips. Building owners and renters can leverage existing programs to obtain energy audits that identify energy efficiency opportunities, and also to help finance the cost of implementation, such as those offered by MidAmerican Energy and Eastern Iowa Light and Power. The City will also work to align existing City loan programs to include energy efficiency where it is not specifically mentioned already, and identify external partners to develop appropriate additional outreach and financial mechanisms that facilitate large-scale participation. Residents can also use several free tools from the U.S. Environmental Protection Agency (U.S. EPA) such as the ENERGY STAR® Home Advisor tool for single family homes, or ENERGY STAR® Portfolio Manager for multifamily buildings.

1.2 Increase Energy Efficiency in Businesses

Commercial and industrial energy efficiency and conservation measures reduce consumption while lowering operating costs and improving occupancy comfort for employees. For broad community-wide adoption, business owners of all sizes can engage in a comprehensive approach that focuses on the most cost-effective improvements. This might include addressing efficiency improvements in production systems, heating and cooling, office/other equipment, lighting, and installation of sensors. Business owners can use existing incentives available from utilities and the State, as well as the benefits of participating in a green recognition program. In some instances, external partners like local banks and lending institutions, builders, or home improvement stores can create opportunities for businesses of all sizes with appropriate incentives that encourage small "mom and pop" shop business owners and large businesses to make energy efficiency investments. The City will coordinate with local and regional business support organizations to engage businesses on the benefits of energy efficiency and the available tools and incentives to implement these improvements.

The Relationship Between Energy and Water

Water is a finite resource, and both its supply and treatment result in significant energy costs. Addressing water efficiency and conservation in homes and businesses at the same time Iowa City addresses energy efficiency makes good sense in the perspective of a comprehensive sustainability approach. Efficiency options that can be adopted quickly and fairly inexpensively include faucet aerators and low flow showerheads and toilets which reduce water consumption. Water conservation applies to behaviors and habits, such as taking a five-minute shower versus a longer one, using minimal water while brushing one's teeth, or relying on native landscaping that requires little or no irrigation.

Actions *continued*

1.3 Increase Energy Efficiency in New Buildings

Iowa City is one of the fastest growing cities in the state, and any new buildings should be as efficient as possible. Iowa City's current code incorporates the 2012 International Energy Conservation Code (IECC), and contractors are required to submit proof of having met these requirements when submitting initial development plans. With the next code update scheduled for January 2019, the City will collaboratively work with all relevant stakeholders to supplement enforcement of the energy code through inspections and/or testing during construction and before occupancy. Further, the City will assess the need for additional staff training, additional staff, and work to build rapport with builders and developers by offering occasional training on key code-specific or general energy efficiency topics to builders and developers. Looking to 2050, the City, along with the business community and developers should investigate opportunities for the creation of a net-zero energy plan that phases in requirements for buildings to produce on-site renewable energy and meet net-zero standards using a phased-in approach.

1.4 Increase On-Site Renewable Energy Systems and Electrification

Renewable energy is becoming more prominent across the country's landscape. It provides the benefit of reducing emissions, and if properly implemented, it lowers costs to power and heat our homes and businesses. As mentioned previously, MidAmerican Energy's commitment to renewable energy production will likely mean that in the future, the City's electricity consumption will be primarily produced from renewable energy. Thus, the focus within Iowa City for GHG reduction is thermal decarbonization (replacing and reducing natural gas consumption).

The City and its partners will engage the entire community around decarbonization by initiating a general public education and awareness campaign on the topic first, with some efforts targeted towards residential home or building owners and others toward business owners. Topics will include the renewable energy landscape in Iowa City, as well as the importance of reducing natural gas usage, while dispelling common myths about electrification of household activities like cooking and laundry. Next, the City will conduct a study of its own buildings that examines electrification opportunities related to space heating and hot water heating, two primary uses of natural gas in buildings. Focus areas of this study will include ground-source heat pump systems, air source heat pumps, and heat pump water heaters. Finally, this study should be expanded to community-wide renewable energy opportunities. The City currently has ground-source heat pump systems (sometimes referred to as geothermal) in four of its buildings. These systems have two advantages. They are highly efficient, particularly for summertime cooling. And they provide both heating and cooling using electricity; therefore, tapping into the increasingly renewable grid electricity available to Iowa City and avoiding the use of natural gas for cold season heating. Iowa City's municipal buildings with ground-source heat pumps have experienced even greater efficiencies than forecasted.

Actions *continued*

1.5 Initiate Community Solar Projects

Although Iowa City's electricity will soon be predominately renewable, community solar could help offset some of the remaining emissions associated with building energy use. Community solar installations consist of off-site arrays of solar panels whose electricity can be shared by more than one household (or other user) through a subscription process. This process allows subscribers to "tap in" to the benefits of solar energy while removing a host of common barriers associated with on-site installation, such as initial capital costs, viability of on-site systems, restrictions for multifamily buildings, and ownership status. For this action, the City will seek to collaborate with MidAmerican Energy and other existing community solar experts and investors to encourage one or several pilot community solar projects in Iowa City that will result in expanding access to the benefits of solar renewable energy to our neighborhoods. With partners in place, the City will investigate the appropriate model(s), seek out funding and host institutions, and help them recruit subscribers. In addition to the inherent equitable nature of community solar projects, the City can consider locating its first project in a neighborhood facing other unique challenges with an emphasis on the equitable distribution of benefits across that community.

1.6 Support Energy Benchmarking Tools

Energy benchmarking allows buildings owners to take a comprehensive look at how their building(s) consume energy over a period of time, usually at least one year or more. When using a benchmarking approach, such as the free tool ENERGY STAR® Portfolio Manager®, owners can compare usage against similar building types to gauge performance and highlight areas for improvement that can result in reduced energy consumption and operating costs. For single family homes, the ENERGY STAR® Home Advisor tool assesses metrics and provides customized energy recommendations. Iowa City will promote the value of energy benchmarking as a tool that leads to a comprehensive understanding of one's energy consumption and an excellent starting point for taking control of energy costs; what is not measured cannot be managed. The City will partner with business and developer groups to identify opportunities to incentivize benchmarking, commissioning/retro-commissioning, and other tools aimed at tracking energy consumption and recognizing high-performing buildings.

Energy Efficiency and Affordable Housing

Often, there is concern that new requirements will create unintended barriers to affordable housing efforts. However, most costs at the time of construction are minimal, and Iowa City will work with community partners and consider solutions that mitigate barriers and significant costs for developers if a new code is adopted. While the construction costs may be incremental, the benefits of energy efficiency have a long life; residents experience lower energy bills and increased comfort, and in the instance of rental buildings, this translates into tenant retention and reduced operating costs in common areas.

Actions *continued*

1.7 Continue to Increase Energy Efficiency in City-Owned Buildings

Iowa City has been tracking energy consumption in its portfolio of buildings since 2008 and will continue to identify opportunities for energy improvements. The City will establish a capital plan to continue installing targeted energy efficiency improvements that achieve the broadest impact. These are currently identified as consisting primarily of HVAC (heating, ventilation, and air conditioning) system improvements. Although budget priorities led to deferred maintenance in the last few years, the City is actively pursuing improvements to these systems, as well as LED lighting improvements and other non-building projects like LED street lights.

How to Contribute

At Home:

- Schedule an energy audit at home.
- Undertake projects to reduce energy use, such as air sealing, insulating your home, and installing energy efficient appliances.
- Make it a habit to turn off lights, unplug equipment when not in use, and set the thermostat to the right level.
- Consider installing solar hot water heaters or ground-source heat pumps.
- Help start a community solar project.
- Take advantage of existing residential financial incentives to undertake many of these ideas.

Photo credit: Neumann Monson Architects

At Work:

- Schedule an energy audit of your business.
- Undertake projects to reduce energy use, such as air sealing, insulating, and installing energy efficient appliances.
- Make it a habit to turn off lights, unplug equipment when not in use, and set the thermostat to the right level.
- Participate in a green certification program.
- Take advantage of existing commercial financial incentives to undertake many of these ideas.
- Benchmark energy use by using ENERGYSTAR® Portfolio Manager.

Check out the Community Action Toolkit for more information at www.iowa-city.org/climateaction.

Taking Action:

Transportation

Taking Action: Transportation

Targets:

- By 2050, replace 55 percent of vehicle trips with sustainable transportation options, such as public transportation, bicycle, pedestrian, or clean vehicles.
- Convert 50 percent of the municipal vehicle fleet to cleaner fuel vehicles.
- Increase community-wide adoption of electric and alternative fuel vehicles.

Background

Equity Considerations:

- Some neighborhoods in Iowa City are not as well-connected as others, putting a strain on households that need to walk longer distances to access public transit and other public services.
- Affordable and reliable mobility choices should be made available for people with special transportation needs, including persons with disabilities, persons with reduced mobility, and low-income populations.
- Increased opportunities and connectivity for active transportation can help address health disparities for some populations.

Co-Benefits:

Transportation is a critical piece of urban and suburban living, and every day Iowa Citians travel to a variety of places to perform their daily routines. The way communities develop over time, referred to as land use, has a direct impact on transportation. Communities with “mixed use development” patterns where stores and other destination points are intermingled with housing, often result in more walkable neighborhoods, friendlier environments for bikes, and fewer single destination trips. The quality of a community’s transportation system has a big impact on quality of life; levels of service, design, operations, and routing determine whether people get to their destinations on time and with little effort, experience inconveniences, or become unable to reach their destinations. An ideal transit system should be convenient, reliable, and accessible, getting people where they need to go when they need to go there,

Background *continued*

and should also offer options for those who cannot afford, or choose not to own a personal vehicle. With these factors in mind, a community can be envisioned where people of all ages and abilities have access to comfortable, safe, and connected multimodal transportation networks that make life easier and more enjoyable.

Iowa City's transportation sector is responsible for 15 percent of the community's emissions, so choices related to transportation can have a big impact upon air quality and GHG emissions. With this in mind, Iowa City must work to shift away from conventional carbon-intensive fuels and choose greener options, while also being mindful of future land use decisions that impact transportation choices. To make progress on emission reduction goals, the Iowa City community must collectively aim to shift 50 percent of trips from conventional personal vehicles to other alternatives that include active transit, such as walking and cycling, public transportation, cars and buses powered by electricity or cleaner fuels, and even eliminating certain trips. For municipal government, this means focusing on improving infrastructure and taking an approach to community development that looks at connecting the transit system to jobs and critical services and developing transit-oriented neighborhoods.

In recent years, Iowa City has progressed by making concerted efforts to improve infrastructure that supports alternative transportation options. For example, Iowa City has over 37 miles of shared-use bicycle paths,[19] nearly 52 miles of additional sidepaths into neighborhoods,[20] and six miles of dedicated bicycle lanes.[21] In 2017, Iowa City adopted a Bicycle Master Plan and efforts are underway to develop a bike share program in partnership with the University of Iowa. To encourage walking, the City operates

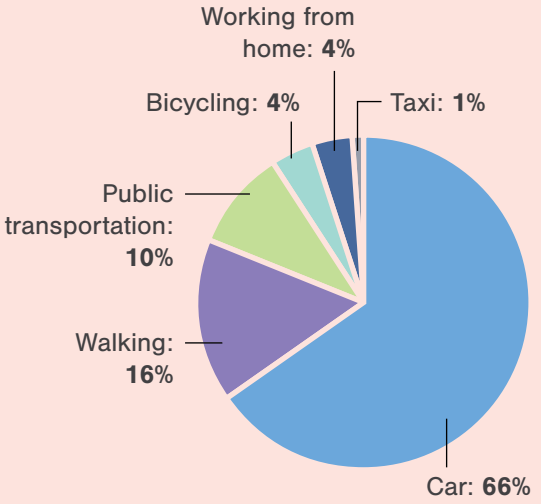
Alternative options for getting to work

Data from the 2015 American Community Survey shows that 66 percent of people who live in Iowa City commute to work using their personal vehicles, and of those, 57 percent drive alone, while 9 percent carpool. As shown in Figure 10, a further 10 percent of commuters use public transportation and almost 20 percent walk or bike to work. Use of active transportation has increased in recent years: 14 percent more people walked to work in 2015 compared to 2011; 21 percent more people rode bikes over the same time period, and the number of residents taking transit increased by 11 percent.[22]

While relying on single-occupancy vehicles for transportation may be convenient to some, the reality is that this approach creates pressures on communities and is unsustainable. As more vehicles hit the roads, not only are there more GHG and other pollutant emissions released into the air, but traffic congestion increases, and the need to dedicate space for parking and build additional roads strains Iowa City. This community must also recognize that not all people have access to personal vehicles, and therefore, alternatives must be available to ensure equitable opportunities for all.

More alternatives are also needed to support inter-city travel. Bus service routes will be introduced

Figure 10. Iowa Citians commute mostly by car, then walking and public transportation



SOURCE: Future Forward 2045 Long Range Transportation Plan; Data from American Community Survey, 2015

in 2018 by the East Central Iowa Council of Governments (ECICOG). A commuter study also recognized commuter rail as an option for consideration in the future.[23]

Background *continued*

many recreational programs and walking trails, and adopted the Iowa City and Pedestrian Mall Streetscape Plan in 2014 to guide future utility and streetscape investments. Construction for several downtown streetscape projects began with a focus on enhanced accessibility and green infrastructure improvements.[24] Finally, Iowa City's public transportation system has added new routes, and the Metropolitan Planning Organization of Johnson County, the local transportation planning organization, has adopted a long-range transportation plan that incorporates an increased focus on multi-modal and active transportation.

The seven transportation-related actions identified as part of this Plan will build upon past progress made while leveraging existing programs, initiatives, and infrastructure. Emissions associated with transportation are the second highest source of emissions in Iowa City's profile after energy consumption in buildings, thus making implementation of these actions a priority in order for the City to reach its emissions reduction goal.

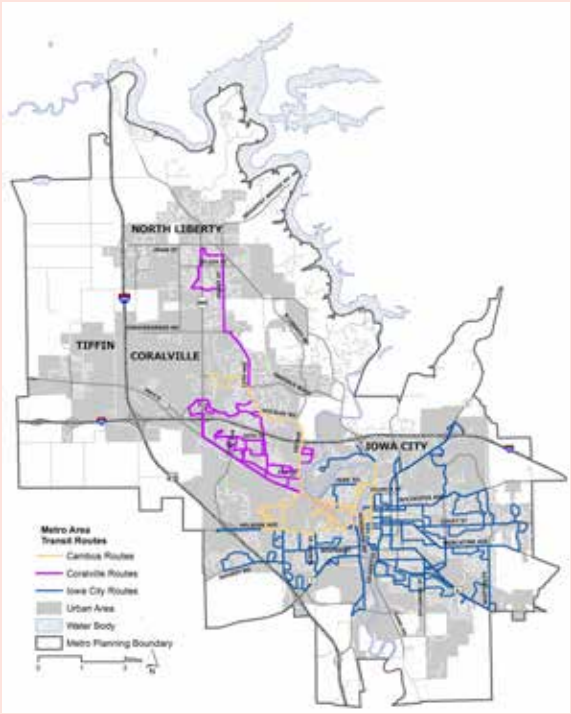
Iowa City's Public Transit System

With 7.1 million rides completed in 2015, the Iowa City Metro Area ranks 11th in the nation for the highest number of bus rides per capita at 66 rides. Iowa City Transit operates 27 bus routes across the City and University Heights using modern buses that include bike racks on standard route service.[25]

All routes originate and terminate in the central downtown transit interchange on Washington Street, with service offered Monday through Saturday, and special night schedules offered on certain routes. Iowa City Transit also provides paratransit services to senior adults and persons with disabilities who are unable to use the regular bus service.[26] In addition, the University of Iowa CAMBUS offers a free, fixed-route public transit service that provides frequent intercampus transportation for students, faculty, staff, and the general public.

A recent report by the American Public Transportation Association found that a drastic decline in ridership has been taking place on major public transit systems in cities nationwide with a 4.1 percent decline in ridership due, in part, to lower gas prices. Iowa City has not escaped this trend. Ridership has decreased in recent years as a result of detours and reroutes due to construction, mild winters, and lower gas prices. This decrease in ridership has impacted the City's progress towards cutting GHG emissions; between 2005 and 2015 emissions derived from transportation increased by 5 percent.

Figure 11. Metro Area Transit services includes routes in Iowa City, Coralville and the University's transit system



SOURCE: Future Forward 2045 Long Range Transportation Plan

Actions

2.1 Increase Use of Public Transit Systems

One of the main ways individuals can contribute to lowering emissions is by electing to take public transit when it is available. To make public transit a more viable possibility, the City needs to offer bus service routes and hours of operation that meet riders' wants and needs. The City will be completing a transit route study to understand options for improvement of the current public transportation system. Actions to be undertaken also include identifying customer-centric initiatives, such as increasing the effectiveness of an intelligent transportation system that provides real-time arrival information to riders—and identifying other flexible and emerging technologies that make riding public transit easier and more convenient.

2.2 Embrace Electric Vehicles, Alternative Fuel Vehicles, and Other Emerging Technologies

Iowa City will look at policies that support the expansion of electric vehicle charging infrastructure across the City, starting with the development of an electric vehicle readiness plan to determine infrastructure upgrades and policy modifications that need to occur to facilitate this expansion. The City will also explore community opportunities offering financial incentives to residents and businesses who purchase clean vehicles, including potential subsidies for buying or leasing an electric vehicle and at-home charging stations, and other potential incentives. Through education and outreach, the City can further encourage residents to transition their personal vehicles to cleaner technologies and explore partnership opportunities with charging station manufacturers that have leasing programs available for municipalities.

Businesses with vehicle fleets should consider a multi-pronged approach that examines opportunities for replacement of gasoline and diesel vehicles with cleaner fuel alternatives, the importance of fleet maintenance for efficient operation, establishment of vehicle idling protocols, efficient routing, and review of transportation operations, such as loading practices. Understanding that automobile technologies are rapidly changing, the City will undertake planning efforts to understand and accommodate emerging technologies as they become market-ready, including connected vehicles that communicate with the driver, other vehicles, and roadside infrastructure, and fully autonomous vehicles that are self-driving.

2.3 Increase Bicycle and Pedestrian Transportation

Residents are encouraged to replace trips, when possible, with active transportation options such as walking and biking. Businesses can support this action by offering programs and facilities—for example, bike storage and showers—that further encourage active transportation. To support the City's commitment to designing, building, and maintaining public streets that accommodate people of all ages and abilities regardless of their mode of travel,[27] Iowa City will continue to advance infrastructure that supports bicycle and pedestrian transportation. This includes continuing to work towards the implementation of the bike sharing program, addressing secure bike storage and parking, implementing priority projects and actions identified in the Bicycle Master Plan[28] to increase the number and connectivity of safe bike routes, continuing to implement priority projects identified in the City and Pedestrian Mall Streetscape Plan,[29] and promoting walkable neighborhoods. These actions will also help to provide "last mile solutions" so that individuals have alternative options for making the final leg of their travels on foot or by bike.

Actions *continued*

2.4 Increase Compact and Contiguous Development

Vehicle miles traveled are directly tied to how cities are planned and developed. Communities that are spread out, inevitably require residents to travel greater distances to reach destinations, therefore consuming more fuel and emitting GHG into the atmosphere. A reduction in GHG emissions requires changes to land use to more compact and mixed-use developments. In 2013, Iowa City adopted a Comprehensive Plan that encourages mixed-use development in the Downtown and Riverfront crossings, as well as in the neighborhood commercial and mixed-use zones dispersed throughout the community.[30] The City will continue to examine how we approve plans with this lens of sustainability by identifying best practices of sustainable design in the plan review process, determining what measures can be taken to encourage compact and contiguous design, and encouraging infill development across the City. Efforts will continue the City's focus on growth along key corridors, while preserving the diversity of housing choices for all income levels.

2.5 Increase Employee Commuter Options

Studies have shown that offering commuting programs to employees can lead to increased productivity, employee satisfaction, and retention. Iowa City businesses should explore offering programs to their employees that include telecommuting, teleconferencing, flexible work schedules, parking discounts for clean vehicles or carpooling, and/or pre-tax commuter benefits that encourage the use of public transportation. From the City's side, a focus can be placed on prioritizing certain public transportation projects that enhance connections between existing neighborhoods and large employment centers. Additional opportunities include expanding the existing car-sharing program (Zipcar). On a longer planning horizon, the City and its transportation partners, including the East Central Iowa Council of Governments (ECICOG), will continue to explore solutions for passenger rail service, express bus service, and carpooling programs between major cities in the area to expand opportunities for commuters.

2.6 Manage Parking Options

The City will align parking policies with its climate goals to provide an advantage for green vehicles and alternative modes of transportation in order to decrease the use of personal vehicles. One of the areas to explore is the elimination of minimum parking requirements for new developments and options for allocation of bicycle and clean vehicle parking spaces. Large employers can develop parking programs that include rideshare coordination, transit subsidies, flexible work schedules, and bicycle accommodations to achieve substantial reductions in parking and personal vehicle trips. Conversely, workplaces need to accurately assess their parking needs and provide input to the City to assist in the development of creative solutions that get people to and from businesses and shopping districts.

Actions *continued*

2.7 Reduce the City's Vehicle Emissions Footprint

Cities around the country are working to reduce the GHG pollution of their fleets by investing in electric vehicles (EVs) and clean and renewable fuels. The City recently purchased two EVs for its fleet and will continue to look at opportunities for increasing their number through negotiated bulk purchases with other Midwestern cities. Additionally, the City should consider converting city buses and other large vehicles to cleaner fuel vehicles at replacement. The City is currently exploring options to add EV charging stations at public and City-owned facilities[31] and will continue to do so. Finally, the City will set goals for reduced idling for their fleet. In the future, an EV readiness study for the community may be a useful document to assist in better understanding the transition to electric vehicles.

How to Contribute

At Home:

- Use public transit, walk, bike, or carpool instead of driving a personal vehicle.
- Examine weekly travel habits and identify ways to combine trips resulting in a reduction of single destination trips.
- Consider purchasing an electric or hybrid vehicle.
- Take advantage of existing financial incentives to undertake many of these ideas, such as flexible transit spending or rebates on EVs.

At Work:

- Implement policies that facilitate telecommuting and flexible employee schedules.
- Allocate parking spaces to hybrids, EVs and carpoolers, if applicable, and provide safe bike storage and showering facilities for bikers.
- Develop a fleet management plan that examines and tracks fleet utilization rates, maintenance and upkeep as a means for efficiency, and replacement of older vehicles with fuel efficient ones.
- Consider purchasing EVs for fleets, if applicable.

Check out the Community Action Toolkit for more information at www.icgov.org/climateaction.

Taking Action:
Waste

Taking Action: Waste

Targets:

- Decrease the amount of waste reaching Iowa City's Landfill by 50 percent by 2025, and 80 percent by 2050 from 2011 levels.
- Complete a Waste Management Plan.

Background

Equity Considerations:

- Accessibility to recycling and composting programs may not be equally and readily available to all community residents and may also be impacted by other participation-related barriers, including awareness of programs, language barriers, and cultural norms.
- In the future, populations that are situated closer to the landfill or the wastewater treatment facility may experience nuisance issues like bad odors and potential health issues.

Co-Benefits:

The waste sector accounts for approximately 2 percent of Iowa City's community-wide emissions, or about 17,575 metric tonnes of CO2e. These emissions are derived from both the operations of the Iowa City Landfill and Recycling Center, which accepts waste from all of Johnson County,[32] and the City's Wastewater Treatment Plant. Although waste is the smallest contributor to the City's GHG total, wastewater and landfill operations can also indirectly cause additional emissions associated with the transportation of solid waste and energy used in the operation of wastewater treatment facilities.

There are a number of reasons why we should aim to reduce the amount of waste generated within the City and reaching the City's Landfill. From an environmental standpoint, by reducing the amount of organic materials such as food, yard waste, and textiles that reach the Landfill, fewer methane emissions are released when the organic material decomposes. Reducing solid waste streams also leads to less energy use overall associated with materials extraction, processing, and transportation. Waste diversion activities, such as those performed by recycling and reuse centers, can generate jobs and support local business development while lessening community burdens, such as land degradation and bad odor. Reducing the local waste stream can also extend the life of the City's Landfill and help maintain disposal costs and rates for residents and businesses.

While there are several options available for reducing the amount of waste reaching the Landfill, reducing waste at the source by purchasing and consuming less material will always be the most effective recourse for dealing with waste. The modern culture of overconsumption and throwaway lifestyle is reflected in the steep increase in the volume of waste generated by Americans each year, as reported by the U.S. EPA.[33] This is particularly evident in the way that food

Background *continued*

is wasted—over 40 percent of the food that is produced in this country is not consumed. By focusing first on source reduction, families and businesses can save significant amounts of money, while lifting some of the burden off waste management services and learning to create value from materials that would otherwise end up discarded.

In Iowa City, several steps have been taken to reduce waste. The City recycling program, as it stands today, began in 1996 and offers curbside recycling pick-up for single-family residences, includes several recycling drop-off sites, and in 2016, started requiring onsite recycling availability for residents in multifamily housing. To further reduce the amount of waste reaching the Landfill, the City has sponsored a Rummage in the Ramp annual event since 2007 to divert furniture, housewares, clothes, books, and other items from the Landfill. In 2018, a ban on cardboard landfill disposal came into effect and will eliminate the 4,000[34] tons of cardboard received each year. The City also operates a composting program. In 2017, its first year of operation, 995 tons of food scraps collected from 15,000 households through curbside garbage collection operations were composted. These waste management programs have helped divert approximately 6.7 percent of local waste from the Landfill when comparing 2011 to 2017 figures.

Although this represents progress in the right direction, there is still much work to be done. The waste stream must be further shrunk by reducing waste at the source, encouraging a shift to reduced and/or smarter consumption of products, and then using alternatives such as reuse or repair of products, or reducing food waste. We must also explore opportunities for water conservation, as well as more efficient processing of water and wastewater at the Wastewater Treatment Plant, which is the source of 15 percent of the GHGs resulting from municipal operations. The only way to reach the target is by creating a culture of awareness and action within the community where everyone does their part to contribute through their daily activities and choices that focus first on source reduction and then on alternatives for reuse, recycling, or composting. The eight waste-related actions in this section will put Iowa City on this path.

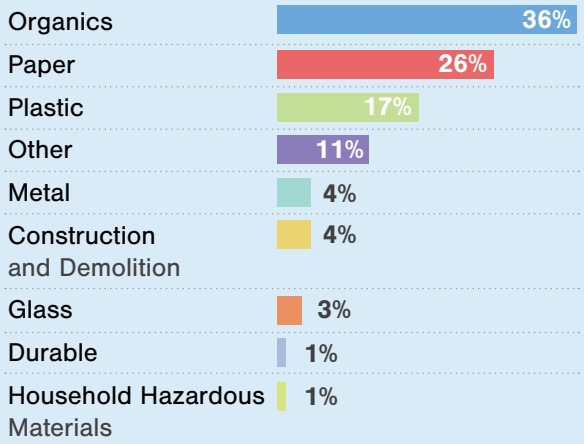
The Connection between Water and Wastewater Treatment and Climate Impacts

Municipal drinking water and wastewater treatment are closely linked to energy and GHG emissions. On a direct level, as the waste in wastewater decomposes, it creates methane and other GHGs that are released into the atmosphere.

Equally as important to consider, is the amount of energy used to distribute potable water to homes and businesses and, after it is used, travels to our Wastewater Treatment Facility for processing. After water is used in homes and businesses across Iowa City, its treatment accounts for the City's highest energy consumption across all other municipal operations. Throughout the entire lifecycle of water, from extraction, treatment, conveyance, consumption, and disposal, large amounts of energy, typically in the form of electricity, are required. By being more efficient and less wasteful in the use of water, electricity can be saved, and by extension, GHG emissions can be avoided.

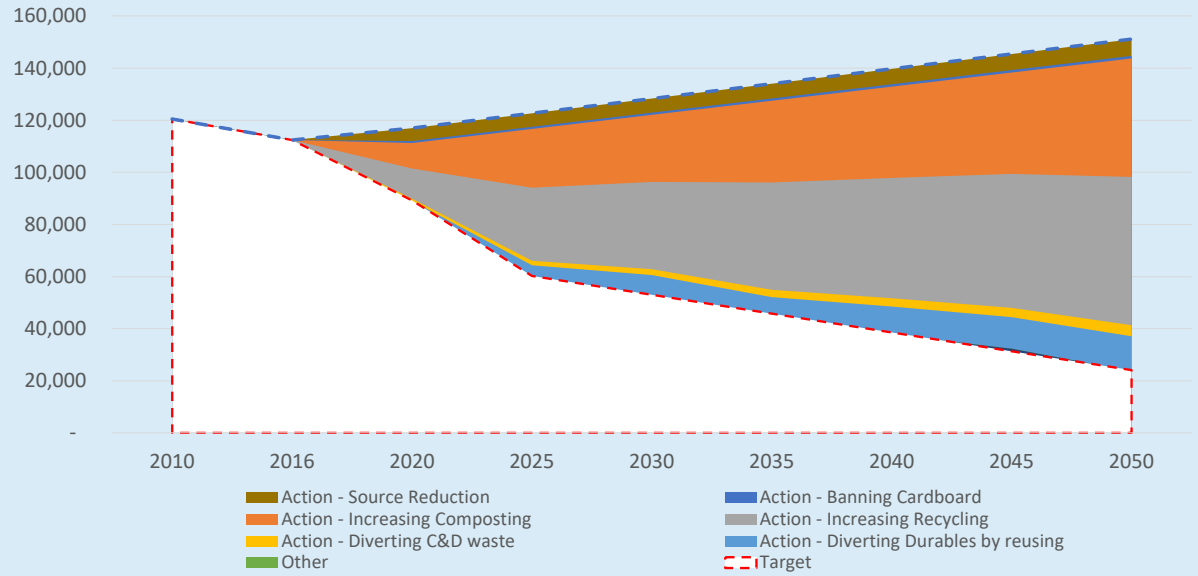
Iowa City's municipal solid waste

Figure 12. Organics, followed by paper and plastic products, make up the majority of landfilled materials



SOURCE: 2017 Iowa Waste Characterization Study

Figure 13. Past and projected waste to landfill (tons of waste) to exceed 140,000 tons by 2050



In 2016, the Iowa City Landfill received 112,411 tons of waste from all of Johnson County with the residential sector contributing 54 percent of these tons and the industrial, institutional, and commercial sector contributing 45 percent.[35] This translates to about 4.2 pounds of waste[36] per person for each day of the year.

Recent efforts to characterize the waste entering the Landfill also show that there is plenty of opportunity to increase recycling efforts. Almost 50 percent of the waste stream consists of paper, plastic, metal, and glass materials that have high embedded GHG emissions associated with material extraction, transformation, and transportation—a high percentage of which can be recycled. A further 36 percent consists of food and organic material, the primary source of the Landfill's GHG emissions, and could easily be composted or avoided through source reduction methods. Iowa City's ecological footprint is analyzed in the consumption-based inventory and highlights that Iowa City residents are consuming four times more of the earth's resources per capita than what is available.[37]

The recent ban on cardboard is a good start in meeting waste diversion targets; however, consideration of consumption at the source is necessary to ensure success. Figure 13 shows a forecasted trajectory towards the target of decreasing the amount of waste reaching Iowa City's Landfill from 2011 levels by 50 percent by 2025. The impact of the actions shown in the image is based on common waste reduction numbers that are achievable with the right level of effort and coordination.

Actions

3.1 Increase Recycling At Multifamily Properties

In November 2016, City Council passed a resolution requiring all multifamily apartments and condominiums with four units or more to provide recycling for their tenants. The mandate has a two-year implementation goal, and by the end of 2018, will extend recycling to more than 10,000 households that had not previously been offered the option.[38] To enhance the effectiveness of the program, the City will continue to educate landlords, property managers, and tenants in an effort to expand coverage and increase recycling rates. Educational opportunities include development and distribution of informational materials, such as new tenant/owner packets, and encourage the involvement of residents through the identification of "building champions" who can offer guidance to their neighbors.

3.2 Increase Composting of Organics

This action involves increasing the overall diversion of organics, such as food and yard waste, as well as textiles, by supporting the expansion of the City's existing composting program through focused efforts on source reduction, education, and exploring options for engagement of businesses that generate large volumes of organic waste. These efforts will be done in partnership with regional and local entities to encourage further composting efforts at home or at private facilities. To accommodate the increased volume of organic waste expected from these efforts, the City will also explore the viability of increasing the capacity of its compost facility.

3.3 Reduce Waste at the Source

Iowa City's consumption-based emissions inventory, "Ecocity Footprint Tool Pilot", analyzed consumption of goods and services within Iowa City. This study showed that residents in Iowa City are consuming per capita more than four times more of the earth's resources than what is currently available. For Iowa City, 96% of the footprint associated with goods consumed are due to production and transport, rather than use and disposal. The report identifies the need to focus on consumption reduction, which is shown to be about ten times more impactful than recycling. The City will continue to educate residents on existing programs and opportunities to curb consumption by reducing and reusing material goods. Emphasis will be placed on reducing priority materials that have a high level of embedded carbon, in particular wasted food, paper, plastic and clothing.[39]

Actions *continued*

3.4 Establishing Partnerships to Divert Construction Waste from the Landfill

By reusing construction materials that would otherwise be disposed of in a landfill, it is possible to avoid the emissions that would come from additional resource extraction, material processing, and transportation of finished goods and products. To increase the diversion and reuse of construction and demolition materials, the City, its partners, and the greater community should assist in the expansion of existing and new waste diversion programs. This will be done by building partnerships between existing organizations that accept deconstruction waste and potential networks of source materials, expanding education and training efforts to deconstruction and demolition companies, contractors, and developers, and providing guidance and materials for residents and businesses to make them aware of the opportunities and benefits of incorporating reused materials in their construction projects.

3.5 Reduce Waste at City Facilities

The City is working to reduce waste in its own operations by minimizing resource use through efficient business practices that consider opportunities for energy, fuel, and waste efficiency in bid requirements from potential vendors and in evaluation criteria. The City is also working to increase recycling at government facilities and will aim to recycle 50 percent of its waste by 2025 and 75 percent by 2050 in alignment with the overall targets. Finally, the City will explore methods for garbage pickup and hauling that are more efficient in reducing the amounts of GHG emissions generated through transport.

3.6 Create a Comprehensive Waste Management Plan

In recent years, cities across the U.S. have begun adopting Integrated Solid Waste Management principles and developing comprehensive plans to effectively manage waste operations. To help plan for the long-term future, Iowa City will develop a waste management plan that looks at waste reduction at the source, recycling, composting, and disposal in a holistic manner, while considering the complexity of surrounding jurisdictions that also contribute to the Landfill. The Plan will set strategic targets for waste minimization and diversion with an initial iteration focusing on waste at City facilities. Further out, the City can expand planning efforts to include other sectors of the community and explore partnerships with other jurisdictions. At the core of the plan will be an effort to encourage a fundamental change in attitudes towards waste—to focus on source reduction first and then reuse and recycling as alternatives to disposal.

Actions *continued*

3.7 Take Action on a Study to Efficiently Capture and Use Methane from Wastewater Operations

After water is used by residents, it flows into the wastewater system and then goes to the City's Wastewater Treatment Facility. While the City currently captures methane gas from the digesters used in the wastewater treatment process, only a portion of the methane is used to offset natural gas usage for the plant. To explore other options for further management of wastewater GHG emissions, the City should conduct a study to determine the feasibility of using all captured methane to create renewable fuel or electricity that can be used to operate the facility, and take specific actions based on the results of this study.

3.8 Take Action on a Feasibility Study on Energy Generation from Landfill Methane

The methane produced by decomposition of organic waste in the Iowa City Landfill is currently being flared to transform it into carbon dioxide, which is a less potent GHG. The City has been considering methods to use the methane as a renewable energy source, and to further explore this opportunity, the City will conduct a feasibility study in FY2019 and take specific actions based on the results of this study.

How to Contribute

At Home:

- Practice source reduction by being mindful of purchasing patterns.
- Buy products with minimal packaging and recycled content and avoid buying disposables.
- Initiate or participate in "repair cafes" as a means of giving longer life to household items that might otherwise be disposed.
- Compost organic waste at home or through the City's composting program.
- Buy fewer, more durable goods, especially clothing.
- Repair instead of purchasing a new item.
- Increase recycling efforts.
- Be efficient with use of water.

At Work:

- Implement sustainable procurement policies.
- Motivate employees to reduce their waste.
- Buy products with minimal packaging and recycled content and avoid buying disposables.
- Compost organic waste, if applicable.
- Increase recycling efforts.
- Be efficient with use of water.

Check out the Community Action Toolkit for more information at www.icgov.org/climateaction.

Taking Action:

Adaptation

Taking Action: Adaptation

Targets:

- Identify vulnerable populations in Iowa City and develop communications and outreach approach
- Assess and plan for climate-related health impacts
- Assure coordination in preparedness planning with relevant agencies
- Assess stormwater management from citywide and neighborhood-specific perspectives

Background

Equity Considerations:

- Some populations, including aging adults, children, persons with disabilities, economically stressed, non-English speakers, and homeless persons, may be particularly vulnerable to impacts of emergencies, health impacts and natural disasters and could fall through gaps in access to information, services, and resources.
- As climate extremes such as heavy rainfall and heatwaves become more common and intense, businesses, employees, and patrons throughout Iowa City will face challenges. Iowa City residents of all backgrounds could then be challenged by the ability to get to work and businesses could experience a decrease in patronage, both of which could result in closed businesses or reduced operating hours for key businesses.

Co-Benefits:

As Iowa City works to limit future climate change through emission reductions, it is vitally important to acknowledge what data says—the climate is already changing. Iowa City is experiencing increased precipitation and rising temperatures with rising frequency of damaging events. These recent changes are projected to become more pronounced in the coming years. It is important to prepare for these changes to minimize disruptions in everyday quality of life and avoid putting lives and property at risk. Addressing climate adaptation touches on Iowa City's built environment, natural environment, the economy, and both social and human health. As part of this Plan, Iowa City developed a vulnerability assessment and climate adaptation report that can be found at www.icgov.org/climateaction.

Background *continued*

Iowa City has already been hard at work addressing climate adaptation. Critical assets that were compromised in the June 2008 flood were addressed in a manner that included an eye towards long-term adaptability. The City's North Wastewater Treatment Facility was inundated by flood waters and major upgrades were made to the City's South Wastewater Plant so the North Plant could be shut down. Homeowners in several areas of the community with properties no longer habitable and prone to repeated flooding were assisted and compensated in a mitigation buyout program. Construction on the Iowa City Gateway project began in May of 2016 with completion set for the fall of 2018. The project includes the elevation of Dubuque Street, Iowa City's main arterial between I-80 and the downtown, to the 100-year flood elevation plus one foot and reconstruction of the Park Road Bridge, widening the span across the river by 100 feet and elevating the bottom of the structure to the 200-year flood elevation plus one foot. These improvements are being made to maintain the transportation network and provide dependable emergency routes during flood events. Iowa City also amended floodplain regulations to require new and substantially improved structures to be elevated or floodproofed to one foot above the 500-year flood elevation.

Climate readiness, climate preparedness, and climate resiliency are all different names for this important work that many cities are taking on. As a component of the Iowa City Climate Action and Adaptation Plan, the City has taken important steps to analyze and recognize local climate risks, identify critical municipal and community-wide assets that are subject to risk, and determine populations that are particularly vulnerable to climate change. This comprehensive planning effort will position Iowa City so that the effects of our changing climate will be minimized and people across the community will be prepared ahead of time to effectively respond to extreme weather events.

Lastly, humans aren't the only ones affected by changes in climate. Increased temperatures, precipitation, and seasonal fluctuations have an impact on the ecosystem including, plants, animals, and insects. Iowa City's recent Natural Areas Inventory and Management Plan identified that natural areas will need to be managed with climate adaptation in mind. Some strategies outlined in the Plan include changing the timing and frequency of prescribed fire, increasing efforts to respond to greater invasive species pressure, considering using species from more southern areas for new plantings, and addressing how runoff, water quality, and erosion impact ecosystems. As a community, we need to recognize a responsibility to protect wildlife, pollinators, and plant life in our community, and change our responses to resource management as the climate changes.[40]

Actions

4.1 Conduct a Vulnerable Populations Asset Mapping Exercise

Assets, as defined in this document, are positive forces within our neighborhoods that improve the quality of life for people across Iowa City. Particularly pertaining to vulnerable populations, there are many governmental programs, community groups, religious institutions, mission-based organizations, and social service agencies whose work targets them directly, or indirectly, by addressing the vulnerability factors that may affect them. Within one year, the City will identify lead partners and work to "map" the civic infrastructure or "community-based assets" specific to vulnerable populations and/or the outlined vulnerability factors. The intent is to initially document Iowa City's resources that can then be mobilized in other actions below, such as the development of the communications and outreach plan and defining clear roles in a preparedness plan.

4.2 Develop Communications and Outreach Plan for Vulnerable Populations

City departments and external stakeholder groups and partners specific to supporting vulnerable populations will communicate the City's adaptation work. This work will focus on preparedness for extreme weather events, general climate impacts, and opportunities to make homes and businesses less prone to flooding (when applicable), and in general, more resilient to Iowa City's changing climate. It is important to note that many external stakeholders may not currently connect issues of climate adaptation to their focus; therefore, outreach efforts will often require initial exploratory conversations, carefully planned discussions, and training and empowerment of ambassadors for effective reach.

4.3 Analyze Climate-Related Public Health Impacts in Iowa City

Given that Iowa City's changing climate brings with it a host of public health implications, the City should document and prepare to address them. Acute and chronic respiratory illnesses, heat stress, and vector-borne diseases are just a few of the public health impacts expected. The State of Iowa and Johnson County provide a significant amount of public health data that Iowa City can utilize, and natural partners may include Johnson County, the University of Iowa, and hospital and health facilities. Documenting the most likely public health impacts related to climate change will guide the City and its public health partners to better prepare to address them. The results of this analysis should be integrated into other actions, including asset mapping, communications and outreach, and preparedness planning.

Actions *continued*

4.4 Coordinate Extreme Weather Preparedness Planning with Local Agencies

Iowa City will collaborate with Johnson County and other relevant internal and external agencies to establish emergency procedures related to climate preparedness. The City will incorporate this information into vulnerable population communication plans so that people across the community know these plans and procedures exist and understand what to expect during an emergency.

June 2008 Flood

The Iowa River in Iowa City reached three of its four historically highest crest (peak water) levels in the last 10 years with records dating back to 1851.[41] The flood that the City experienced in June of 2008 had a record crest level of 31.53 ft.

The Flood of 2008 impacted many communities across Eastern Iowa, including the urban centers of Iowa City and Cedar Rapids. In Iowa City, it is estimated that nearly 700 homes and over 250 businesses were damaged by floodwaters, while nearly 2,000 acres were flooded.[42] Since then, the City has successfully initiated the buyout of 101 homes located in flood-prone areas to avoid this kind of devastation for homeowners in the future.

The City's north wastewater treatment facility was rendered nearly inoperable and provided very limited functions for over 30 days. The South Wastewater Treatment Plant was expanded and the flooded North Plant was demolished and is in the process of becoming a riverfront park/wetlands area. Critical assets, such as bridges and rail lines, were also damaged.

Overall, there was an estimated $7 million in damage to public property, and significantly higher amounts for private property damage. The University of Iowa alone is said to have suffered $232 million in damage and lost operations.[43]

Actions *continued*

4.5 Assess Citywide and Neighborhood Stormwater Management

Managing stormwater runoff is a common problem faced in the built environment. In urbanized and growing communities like Iowa City, it is important to address existing buildings and green space, while developing clear guidelines for newly planned areas. Currently, the City abides by the State's guidelines and incorporates stormwater work into the capital project planning process. The City's work in riparian planning near rivers, creeks, and other waterways includes the use of native plants and removal of invasive species. The City will continue to work to identify neighborhood stormwater conveyance issues that may exist and consult stormwater best practices to find opportunities to address these problems.

Significant public education that pushes individuals to also consider their actions on private property will be useful. Residents and business owners should consider native plantings, that require less irrigation, or employ other onsite stormwater management tactics. These include inspection-approved permeable pavement and rain gardens that allow water to naturally seep into the water table, or if space permits, rain barrels and cisterns to capture water for "graywater use," such as watering plants or washing a vehicle.

4.6 Expand Iowa City's Tree Canopy

Iowa City maintains a street tree inventory, and total tree coverage across the city is at 33 percent. The City acknowledges that trees are an important element in both climate mitigation and adaptation because they remove carbon dioxide from the air, storing the carbon in trees and soil, while releasing oxygen into the air. Trees increase comfort by providing immediate shade and cooling to people, buildings, and pavement. In order to protect trees, the City has a sensitive areas ordinance and policies regarding tree removal for developing areas. The City is also preparing for the loss of ash trees related to the spread of the Emerald Ash Borer. Taking all this into consideration, Iowa City will continue to maintain and monitor its current stock of trees and encourage growth, and expansion where appropriate.

HOW TO CONTRIBUTE

At Home and At Work:

- Be active in the community, get to know your neighbors, and participate in City and neighborhood planning efforts.
- Connect a rain barrel to your gutter system.
- Consider using permeable pavement, implementing a green roof, and installing other green infrastructure alternatives.
- Avoid installation of additional non-permeable pavement.
- Plant native plants and trees, while considering the strategic location of trees as a means to increase shade.

Check out the Community Action Toolkit for more information at www.iowa-city.org/climateaction.

Taking Action:

Sustainable Lifestyle

Taking Action: Sustainable Lifestyle

Targets:

- Moving towards a “One Planet Living” lifestyle that addresses the global impact of Iowa City’s consumption
- Creating a culture of sustainability across Iowa City as a general way of life
- Promoting local food options and considering eating less meat and dairy
- Practicing source reduction by eliminating waste before it is created

Equity Considerations:

- Some populations, including older adults, children, persons with disabilities, economically stressed, non-English speakers, homeless populations, and other groups can often fall through gaps in the access to information, services, and resources.
- Some aspects of a sustainable lifestyle may have increased upfront costs, such as the purchase of high efficiency appliances, alternative fuel vehicles, community-supported agriculture, etc., while later reducing costs in other areas, such as fuel purchases or long-term health costs associated with a poor diet.
- Programs that support local businesses can inject money into the local economy, creating job opportunities.

Co-Benefits:

Background

In the public forum held during plan development, and in the survey, many residents expressed strong interest in behavioral and lifestyle changes perceived to be more environmentally responsible and associated with lower greenhouse gas emissions.

In discussions of the steering committee, it was recognized that sustainable living actions would have co-benefits for the climate action plan here in Iowa City. For example, many sustainable living initiatives would generate excitement and visibility within the

Background *continued*

community, draw residents into further education and mitigation actions, and seed new partnerships. Successful sustainable living initiatives could enhance ties between existing partners, engender new partnerships, providing marketing materials around sustainability, and generate entrepreneurial opportunities. Therefore, the committee felt that sustainable living actions should be facilitated by the City. To the degree they can be implemented, they will reduce emissions directly in Iowa City, such as waste and transportation-related emissions. Furthermore, as shown in the City's Consumption-Based Emissions Inventory, there are additional GHG reductions outside the boundaries of Iowa City associated with many sustainable living actions. Some people across Iowa City already understand this, as four out of five survey respondents expressed that the biggest barrier to addressing climate change is "difficulty in changing behavioral habits."

There are many initiatives we can take that add significant value by serving as a catalyst for community-wide action and change the mindset of neighbors, residents across the community, business owners, City employees, and others. Making this kind of broad change requires well-crafted education and outreach that connects what data is telling us to the actions we take in our daily lives. Good examples of success with this kind of cultural shift in thinking are the campaigns created in the 1970s around smoking, wearing seatbelts, or littering.

The City has already taken strides to create awareness on how our personal choices make a difference, particularly in waste and recycling, with the expansion of recycling services and initiation of food composting. In the survey cited above, over 90 percent of Iowa City respondents indicated that

reducing waste was an action they were currently taking to reduce the impacts of climate change. This awareness has not yet translated into significantly increased rates of recycling. Similarly, recognizing the impact our individual food choices have on emissions "upstream" or outside of Iowa City is important as well. Building upon this can result in a groundswell of community support around more climate-related actions that we can take at home with an understanding that if each of us chooses a few actions where we personally can have an impact, the end result will put Iowa City on the path needed to create a climate-aware community.

Most of the actions in this Plan have quantifiable reductions in GHG emissions associated with them. Sustainable Lifestyle actions presented in this section are much harder to quantify in locally-based emissions due to calculation methodologies and the difficulty in estimating impacts for actions that cause reductions outside of the immediate geographical

boundary. However, they do result in reducing global emissions and are equally as important in their ability to create awareness and lead to healthier and happier communities. These actions can lead to healthier lifestyles, support for local businesses and jobs, and increased green space. Finally, some actions do contribute to reducing emissions at a scale than can be calculated for purposes of this Plan; in other words, direct emissions occurring within the boundaries of Iowa City.

Actions

5.1 Encourage a Plant-Rich Diet

Several groups of engaged residents across Iowa City are already acting on the importance of a plant-rich diet, or at minimum, adding more plants to their diets and reducing meat consumption—even if only for a day—such as the popular "Meatless Monday" national campaign that aims to create awareness. Iowa City's survey of around 800 participants indicated that "eating a plant-based diet" was the least frequent action selected when participants were asked to indicate all of the actions they currently take to reduce climate change impacts. The City will support other lead groups in the development of an education and outreach campaign that features the climate benefits of a plant-rich diet and other ancillary benefits, such as improved health and disease prevention. Implementation will include work to connect other potential partners, such as the network of community gardens across the city, community-supported agriculture (CSAs) in the region, and farmers markets.

Shifting to a plant-rich diet can have numerous economic and health benefits for Iowa City residents. For example, plant-based diets can help reduce calorie intake, helping individuals manage their weight, and prevent a variety of diseases.[44]

5.2 Expand Community Gardens and Access to Healthy Local Foods

Across Iowa City, there are a variety of ways for community members to access locally-grown plants and vegetables. Farmers markets, personal gardening, and community-supported agriculture are all ways to ensure that people across Iowa City have access to healthy local foods. The City also operates a community garden plot leasing program in which anyone can lease a plot at one of four (soon to be expanded to six) different sites to grow their own produce, as well as participate in the Beginning Gardening program. Tapping into its Parks Master Plan, the City can identify appropriate expansion of new land for community groups to create vegetable gardens and provide additional plots for leasing as popularity of the Beginning Gardening program expands. To get the greatest adoption of this program, focus will be on neighborhoods disproportionately impacted by poverty and food insecurity.[45] Community-based organizations and institutions such as churches, neighborhood groups, and associations can help take responsibility for suggesting locations, recruiting leaders and community members, and setting up and maintaining these gardens. The City will consider the type of aid it may be able to provide, including but not limited to, different leasing options, basic liability insurance, water access, a "big tools" garden lending program, and limited start-up funds for low-income neighborhoods.

Photo credit: Wild Woods Farm

Plant-Based Diet

By shifting to a predominantly plant-based diet, GHG emissions occurring outside of Iowa City can be impacted. Livestock converts about 11 percent of the energy it is fed into human food and dairy products[46] and a significant amount of emissions are associated with the clearing of land for agriculture, the growing of single-crops for feed, and methane released from the animals. The Environmental Defense Fund reports that if each American replaced chicken with plant-based foods at just one meal per week, the carbon dioxide savings would be the same as taking more than half a million cars off American roads.[47]

Actions *continued*

5.3 Encourage the Purchase of Local Products and Responsible Purchasing

Purchasing local products can result in the direct elimination of emissions associated with transportation, while also supporting local jobs and economic development. Similarly, purchasing reused and more durable products can also affect emissions. For this action, the City will engage partners across Iowa City to help educate residents on the importance and impact of sustainable consumption habits and the multiple benefits to buying local food and other goods. The combination of initiatives may include developing innovative campaigns in collaboration with business owners, and facilitating the setup of business fairs, farmers markets, and other events that promote local businesses and sustainable consumption.

5.4 Create Funding Mechanisms to Support Community-Wide Climate Action

Climate action efforts can have various costs associated with them, some of which require the creative identification of funding mechanisms to make the projects a reality. To support residents, businesses, and community-based organizations in the implementation of actions included in this Plan, the City will document funding gaps and existing financial incentives, identify a variety of potential funding partners, and investigate best practices used in other cities. Proven mechanisms and tools that work in other communities include revolving loan funds, public-private partnerships, and working with utilities to access incentives and develop programs best suited to help utility customers use energy more efficiently.

5.5 Incorporate This Climate Plan into the City's Sustainability Communications

The City currently implements a number of sustainability-related communications efforts that utilize the City's website, a dedicated newsletter, cable programming and resources, and social media platforms. Developing and implementing a coordinated communications effort for the City's climate work will help to expand existing efforts to inform people of the City's sustainability progress and its leadership in climate action. It will also serve to solidify Iowa City's climate "brand," while making sure this message reaches all members of the community. Communications staff will work closely with those City staff charged with developing annual progress reports for the Plan and STAR Community Rating reports, while focusing on educational and awareness opportunities to make sure the full community is engaged. Demographic and geographic considerations will be essential to the effectiveness of the communications plan. Key elements of the communications plan will likely engage people on why "climate action now" is important and how residents can contribute to the actions that will allow Iowa City to reach its emission reductions goal.

Actions *continued*

5.6 Initiate a Green Recognition Program

There are many existing green certification or labeling programs available to all building types, such as Leadership in Energy and Environmental Design (LEED), Green Business Certification Inc. (GBCI), and Green America. Building owners and operators will be encouraged to explore the benefits of participating in these programs that lead to energy and cost savings, employee comfort, and the associated marketing component that allows businesses to share their stories and attract customers due to their sustainability commitment. As part of this action, within one year, the City will explore putting together a recognition program that acknowledges non-residential building owners that successfully participate in a green labeling or sustainable and environmentally focused recognition program.

5.7 Develop Internal City Sustainability Operations Guide

The City will consider existing sustainability efforts and build from these to develop internal sustainable policies for departments and divisions to integrate into their daily work. The development of an everyday office guide will examine daily habits regarding computer usage and overhead lighting, responsible use of paper, and other relevant measures. Further, a sustainable meetings policy will carry over key practices—some already implemented by City employees—into meetings, which will lead to more efficient energy use, further reductions in paper consumption, and other resources. The City will provide guidance on the use of ambient light, "officially" permit and encourage teleconference attendance at meetings when possible, send meeting materials electronically, use recycled paper products, and use real dishes or compostable food handling materials for meetings with food. Finally, sustainable purchasing guidelines will outline the purchase of recycled paper and energy efficient office equipment, as well as support local purchasing and other sustainability considerations as desired. The end goal is to increase the use of environmentally superior products where quality, function, and cost are equal or greater. This may also include products and packaging materials that contain a prescribed minimum post-consumer recycled content and/or substitutes with more environmentally appropriate alternatives.

How to Contribute

At Home:

- Buy local products and services.
- Purchase durable goods whenever possible.
- Eat less meat and dairy and shift to a more plant-based diet.
- Practice source reduction by curbing consumption.
- Recycle properly to avoid unintended contamination.
- Consider planting fruits and vegetables instead of buying them.
- Conserve water and use it more efficiently.
- Reduce at least one car trip per week.
- Walk, bike, and carpool more.
- Engage family, friends, and neighbors.

At Work:

- Implement a supplier program to focus use on local products and services.
- Participate in an existing, nationally recognized green certification program.
- Develop green office guidelines and engage employees.

Check out the Community Action Toolkit for more information at www.icgov.org/climateaction.

Plan Implementation

Call to Action

The Plan provides a roadmap to a more sustainable and resilient future. Reaching this future requires that we go beyond planning to focus on directed implementation where everyone plays a part.

As mentioned previously, collaboration will be needed between the City's elected officials and staff, businesses, industry associations, the University, community-based organizations, utility service providers, nonprofits, and residents to ensure these goals are reached. For many of the actions included in this Plan, it will be especially important to identify champions, and support collaboration across sectors and even across regions with other cities in the county.

Whether one is active in their community, making personal efforts to have a more sustainable lifestyle, or working in a business with commitments to sustainability, every effort counts. It is the sum of all of these discrete initiatives that will allow those who live, work, and play in Iowa City to magnify the impact of these actions and create a better life for all. Everyone is invited to continue efforts and take additional action using the guidance provided in this Plan. Together, great strides towards ensuring a sustainable future for Iowa City can be made.

Further, because the Steering Committee provided key input and direction in the development of this Plan, the members may be the ideal starting point in building a "Climate Action Advisory Board." The Board would be a continuation of the existing body that helps to lead and support implementation of the Plan. Key areas of involvement will include, but not be limited to, assisting the City in tracking all performance metrics associated with each action and overall progress; engaging and recruiting partner agencies and groups to lead specific actions; initiating action subcommittee and partner next steps; and serving as a general go-between for

the City, partner agencies, and the general public. In many respects, this role will define and shape itself as time moves forward, so those involved must be ready to help guide direction and fill in where gaps persist initially. The success of this Plan is contingent upon the City's full support and an engaged community, led by those with an intimate knowledge of the Plan, along with others whose demonstrated commitment to at least one key area of the Plan is evident. A cultural shift is necessary to make relevant and substantial change; without direct support, innovation, and actions coming from the Iowa City community, this Plan will not succeed.

In hindsight of this planning process, and despite an initial attempt to create broad representation of the community, the Steering Committee and City have identified additional groups that have not been fundamentally included in the planning stages. The City of Iowa City and the community will be making choices about how to best implement the actions prescribed in the Plan. To minimize the potential of unfair or inequitable implementation of Plan actions, the Steering Committee's equity sub-committee reached a conclusion that these Plan actions should be reviewed more in-depth for equity considerations. A comprehensive review which hears from and incorporates views from populations which could be most impacted by implementation will be an essential step in guaranteeing that certain populations are not disproportionately impacted by how the actions are executed.

Call to Action *continued*

This Plan equity review team, consisting of the City, individual community members, and representative groups can use the Iowa City Equity toolkit as a template, or develop some other method of evaluation. The equity sub-committee suggests that this team prioritize action review first by actions that could be initiated the fastest and actions that could have the greatest impact upon specific individuals or groups. One of the struggles the equity sub-committee encountered was to determine which people of this community are needed to make sure that a wide variety of groups found in Iowa City are represented on an equity review team. Along with the Iowa City Equity Director, the equity sub-committee defined a non-exhaustive list of groups to consider as part of the equity review team, including veterans, persons who rent, senior adults, secondary and university students, youth, persons with disabilities, immigrants, refugees, English-Language-Learners, persons who are homeless, households with low-incomes, and other persons characterized as a protected class. The equity sub-committee recommends seating a standing equity review group, which includes some or all of these groups to ensure equity is a standard consideration and achievement in future plans and actions.

Glossary

Glossary

Adaptation: Adjustment or preparation of natural or human systems to a new or changing environment which lowers the risks posed by the consequences of climate change.

Carbon Footprint: The total amount of greenhouse gases (GHGs) emitted into the atmosphere each year by a person, family, building, organization, or company. A person's carbon footprint includes GHG emissions from fuel that an individual burns directly, such as by heating a home or riding in a car. It also includes GHGs that come from producing the goods or services that the individual uses, including emissions from power plants that make electricity, factories that make products, and landfills where trash is sent.

Cities for Climate Protection Campaign (CCP): One of three major global transnational municipal networks aimed at reducing urban GHG emissions. Established in 1993, the CCP program houses more than 650 municipal governments representing over 30 participatory countries

Climate Change: Climate change refers to any significant change in the measures of climate lasting for an extended period of time. In other words, climate change includes major changes in temperature, precipitation, or wind patterns, among others, that occur over several decades or longer.

Carbon Dioxide (CO2): A naturally occurring gas and also a by-product of burning fossil fuels and biomass, as well as land-use changes and other industrial processes. It is the principal anthropogenic GHG.

Carbon Dioxide Equivalent (CO2e): A measure of the global warming potential (GWP) of all GHGs emitted including methane (CH4), nitrous oxide (N2O), and other gases in addition to CO2.

Compact of Mayors: A global coalition of city leaders addressing climate change by pledging to cut GHG emissions and preparing for the future impacts of climate change. Now joined with the Global Covenant of Mayors for Climate and Energy.

Consumption-Based Emissions Inventory (CBEI): Refers to an emissions inventory that in addition to traditional emissions created within the city limits, evaluates emissions associated with all consumption, regardless of where it is produced. Local governments are beginning to pursue this type of inventory to better understand how food and other materials purchased and consumed by the community have an impact on the environment and economy.

East Central Iowa Council of Governments (ECICOG): A regional planning agency that provides planning and technical assistance to local governments in Benton, Iowa, Johnson, Jones, Linn, and Washington Counties.

Global Covenant of Mayors for Climate and Energy (GCoM): An international alliance of cities and local governments with a shared long-term vision of promoting and supporting voluntary action to combat climate change and move to a low emission resilient society.

Global Warming Potential (GWP): Multipliers for each greenhouse gas developed to compare the heat-trapping ability of individual GHGs relative to that of carbon dioxide.

Global Protocol for Community-scale Greenhouse Gas Emissions Inventory (GPC): A standard method for accounting and reporting city-wide GHG emissions created by World Resources Institute, G40 Climate Leadership Group and ILLEI. This protocol is required for the Global Covenant of Mayors.

Green Business Certification Inc. (GBCI): An American organization that provides third-party credentialing and verification for several rating systems relating to the built environment.

Green Infrastructure: Ecological systems, either natural or engineered, which manage water in a way that mimics the natural water cycle and lessen wet weather impacts.

Greenhouse Gases (GHGs): Include carbon dioxide (CO2), methane (CH4), nitrous oxide (N2O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF6).

Heat Island: An urban area characterized by temperatures higher than those of the surrounding non-urban area. As urban areas develop, buildings, roads, and other infrastructure replace open land and vegetation. These surfaces absorb more solar energy, which can create higher temperatures in urban areas.

International Code Council (ICC): A member-focused association dedicated to helping the building safety community and construction industry provide safe, sustainable, and affordable construction through the development of codes and standards used in the design, build, and compliance process.

International Council for Local Environmental Initiatives (ICLEI): International nonprofit organization providing software and assistance for communities

Glossary *continued*

to calculate their emissions. ICLEI was formerly known as International Council for Local Environmental Initiatives and has changed their name to Local Governments for Sustainability.

Kilowatt-hour (kWh): A unit of electricity.

International Energy Conservation Code (IECC): A building code created by the International Code Council in 2000. It is a model code adopted by many states and municipal governments in the United States for the establishment of minimum design and construction requirements for energy efficiency.

Iowa City Metro Area: As defined by the United States Census Bureau, an area consisting of two counties in Iowa (Johnson and Washington) anchored by the City of Iowa City.

Last Mile: A supply chain management and transportation planning term to describe the movement of people and goods from a transportation hub to a final destination.

Leadership in Energy and Environmental Design (LEED): A set of rating systems for evaluating the design and environmental performance of buildings, homes, and neighborhoods. Devised by the United States Green Building Council, the system provides specifications to projects for environmentally friendly actions, both during the construction and use of the building.

Methane (CH4): A hydrocarbon that is a GHG with a global warming potential 21 times that of carbon dioxide (CO2). Methane is produced through anaerobic (without oxygen) decomposition of waste in landfills, animal digestion, decomposition of animal wastes, production and distribution of natural gas and petroleum, coal production, and incomplete fossil fuel combustion.

Metric Tonne: One thousand kilograms, or approximately 2,205 U.S. lbs.

Mitigation: A human intervention to reduce the human impact on the climate system; it includes strategies to reduce GHG sources and emissions.

Mixed-Use Development: Characterized as pedestrian-friendly development that blends two or more residential, commercial, cultural, institutional, and/or industrial uses.

Natural Gas: Underground deposits of gases consisting of 50 to 90 percent methane (CH4) and small amounts of heavier gaseous hydrocarbon compounds such as propane (C3H8) and butane (C4H10).

Net Zero Energy Building: A building which produces as much energy as it uses over the course of a year.

Resilience: The capacity of a community, business, or natural environment to prevent, withstand, respond to, and recover from a disruption.

STAR Communities: A nonprofit organization that works to evaluate, improve, and certify sustainable communities. The organization administers the STAR Community Rating SystemTM (STAR), a framework and certification program for local sustainability.

Territorial-Based Inventory: A method of GHG emissions accounting that looks at a geographic territory as the boundary for the accounting. Territorial-based approaches do not take into account GHG emissions from products and services that are imported to a territorial boundary and are consumed within the boundary.

Therm: A unit of measure for energy that is equivalent to 100,000 British Thermal Units (BTUs), or roughly the energy in 100 cubic feet of natural gas. Often used for measuring natural gas usage for billing purposes.

Thermal Decarbonization: Replacing fossil fuels (such as natural gas) with low-carbon energy or renewable sources to meet thermal (or heating) needs. Also referred to as building electrification.

U.S. Conference of Mayors: Official non-partisan organization of cities with a population of 30,000 or larger.

U.S. Mayors Climate Protection Agreement: A voluntary initiative in which participating mayors commit their cities to taking action to reduce GHG emissions. The Mayors Climate Protection Agreement is an initiative of the U.S. Conference of Mayors and was unanimously endorsed by the conference in June 2005.

Urban Sustainability Directors Network (USDN): A peer-to-peer network of local government professionals from cities across the United States and Canada dedicated to creating a healthier environment, economic prosperity, and increased social equity.

Vehicle Miles Traveled (VMT): A unit used to measure vehicle travel made by private vehicles, including passenger vehicles, truck, vans, and motorcycles. Each mile traveled is counted as one vehicle mile regardless of the number of persons in the vehicle.

Appendices

Methodology for GHG Impact Calculations for Actions in Iowa City Climate Action and Adaptation Plan

GHG impact calculations for actions in the Plan were developed using a spreadsheet model that relied upon data from the Iowa City Community-wide Greenhouse Gas Emissions June 2017 Inventory Update, data from the United States Census Bureau, and published research as described below. The primary method used, estimates the GHG reduction impact of a single activity, such as retrofitting a building to conserve energy, and multiplies that by a citywide scale of implementation to estimate the impact of an action once fully deployed.

Targets

Iowa's City's emissions reduction targets of 26 to 28 percent below 2005 levels by 2025 (27 percent was used for the sake of calculations) and 80 percent below 2005 levels by 2050 were compared to its historical, current, and forecasted future emissions under a business as usual scenario.

The impact of Iowa City's electricity provider becoming 100 percent renewable and the University of Iowa Power Plant switching away from coal was incorporated into a modified forecast of future emissions.

The GHG reduction impacts of the actions in Iowa City's Plan were then analyzed for 2025 and 2050. Taken together, the actions in the plan, when implemented at scale, will allow Iowa City to meet its GHG goals.

Strong program evaluation is essential to ensure that the actions Iowa City implements perform as expected. Frequent real-world measurements of impact will help Iowa City stay the course toward its goals and make adjustments as needed. The estimated impact of actions for this report are intended to give a sense of the scale of activity needed to meet Iowa City's goals and should not be taken as a substitute for measured impact performance tracking.

Buildings Calculation Assumptions and Targets

Because the adjusted future scenario already includes zero emissions electricity, the GHG impact of the Buildings Actions comes in the form of reduced natural gas use and associated emissions. Efficiency and renewables that reduce use of grid electricity will continue to have significant benefits, such as cost savings and resilience improvements.

- **Existing Buildings:** Retrofit 10 percent of all buildings by 2025 and 90 percent by 2050.
  - o Retrofits are estimated to save 30 percent of energy use in 2025 and go deeper to have saved 56 percent on average by 2050.
  - o Retrofits are cumulative—the building retrofitted in 2020 is assumed to still be generating savings in 2025.
- **New Buildings:** Achieve 45 to 48 percent energy savings in new buildings due to code enforcement by 2025, and 80 percent energy savings by 2050 due to code enforcement and phased-in approach to net zero energy policies.
  - o To avoid double counting, these buildings are assumed to be a separate set with different savings than the existing buildings undergoing energy efficiency or buildings with on-site renewable energy efforts.
- Renewable Energy or Whole Building High Efficiency Equipment: Transition 3 percent of buildings with natural gas to high efficiency electrical heat powered through low-carbon electricity sources by 2025 and 25 percent by 2050.

Transportation Calculation Assumptions and Targets

Transportation calculations account for the overlapping impacts of the actions—a household that switches to an electric vehicle running on renewable energy may also start biking to work, but they will not save the emissions that their commute used to create more than once. A widespread adoption of zero emissions vehicles by 2050 is included in all actions as a significant decrease in the carbon emissions of the average vehicle mile traveled in Iowa City.

- By 2050, replace 55 percent of vehicle trips with sustainable transportation options, such as public transportation, bicycle, pedestrian, or clean vehicles.
  - o GHG emissions reductions result from reducing vehicle travel (vehicle miles traveled) and associated emissions and gasoline use by carpooling, taking public transit, walking, biking, and reducing the number of trips taken.
  - o Vehicle travel in Iowa City is forecasted to increase significantly. The actions in this category at the scale discussed, curb that growth, but do not stop it.
  - o Calculations assume public transit ridership growth occurs on existing routes or electric/zero emissions transit. If fossil fuel transit is

Methodology *continued*

expanded or run more frequently, emissions savings will be less.
  - Because the Community-wide GHG inventory only looks at vehicle travel within Iowa City, emissions reductions are considered only within city borders as well, but many of the actions identified could create emissions benefits for other communities that are origins or destinations of travel.
- Increase community-wide adoption of electric and alternative fuel vehicles.
  - Alternative fuels are modeled as electric vehicles running on zero emissions electricity—2 percent of vehicle travel in Iowa City in 2025, and 50 percent in 2050.
  - Transportation electricity demand will increase as electric vehicles are used more widely, but community-wide electricity demand will decrease if new and existing building efficiency actions are taken.
  - Improvements to the municipal fleet are assumed to be included in this calculation.

Waste Calculation Assumptions and Targets

- Decrease the amount of waste reaching Iowa City's Landfill by 50 percent by 2025 and 80 percent by 2050 from 2011 levels.
- Complete a Waste Management Plan.
  - Waste emissions are modeled to decrease against business as usual based on the combination of waste actions in the Plan.
  - The waste and wastewater emissions remaining after waste management solutions are implemented are assumed to be largely addressed through energy generation strategies. If studies prove these to be unfeasible for Iowa City, additional waste management will need to be implemented to reduce waste and wastewater emissions and meet the 2050 GHG target.

Sources

The primary source of data was the communitywide GHG inventory spreadsheet "Iowa City Emissions Tracking Calculator.xlsx" provided by Iowa City staff. Supplemental data included the U.S. Census American Community Survey, local building permit data, the Federal Highway Administration's National Household Travel Survey, U.S. Energy Information Administration data, Iowa City's Long-Range Transportation Plan, Iowa Economic Development's "Advancing Iowa's Electric Vehicle Market," the Center for Neighborhood Technology's CNT Housing + Transportation Affordability Index, and local waste data provided by City staff.

About the Survey

In order to elicit feedback from a broader cross section of Iowa City stakeholders, Iowa City launched an online survey following the November 2017 community meeting. The survey was active for six weeks, during which about 800 people shared their interests, concerns, and experiences as they relate to climate change, as well as their basic demographic information. Survey responses provide crucial insights to supplement feedback and information gathered during community meetings; additionally, demographic information helps to pinpoint stakeholders that may require additional engagement efforts. Insights have been incorporated into the development of this plan.

Over half of respondents reported that they think about climate change every day and yet the majority felt they were only "moderately" informed, indicating a need for additional educational opportunities. Despite this, nearly every respondent reported taking at least one step towards reducing climate change impacts, most frequently by reducing waste and reducing electricity consumption.

Sixty-five percent of respondents expressed interest in participating in future projects associated with the Iowa City Climate Action and Adaptation Plan. Respondents reported being most interested in learning more about residential and commercial energy efficiency and renewable energy alternatives. Impacts on agriculture and food production, loss of habitat and species, decreased air quality, and increased flooding were the most frequently cited concerns associated with climate change, some of which are addressed directly and indirectly in this plan.

Only one demographic was underrepresented in the online survey: non-white populations. Otherwise, survey respondents were evenly distributed by age and annual household income. Iowa City must do more to reach out to underrepresented groups and ensure that the feedback of all Iowa City residents is included moving forward. This is important in the implementation of all actions, and particularly so with specific actions, such as the development of a communications plan for vulnerable populations.

Quotes from the Survey

"Finding a way to incentivize the members of our community to take steps towards improving the efficiency of their homes and businesses, with respect to the opinions of people on all sides of this issue, will get people brought into the greater goal of increased sustainability of the resources in our area, reduced dependence on non-renewables, and making the Iowa City area a better place for our kids and grandchildren."

"The plan should focus on voluntary and incentivized programs that encourage participation, not command and control policies that undermine affordability and drive development to other communities."

"Change begins with commitment from businesses and cities. Start there, and people will follow! Also, if you want people to utilize alternative ways of transportation you need to make it more safe for cyclists. There is a demand for it, and people are more likely to change their behaviors if you make them feel safe. Hope to see some change all around in the near future!"

"Make sustainable living more inclusive and not a luxury."

"Often times sustainability is seen as a niche activity that is not accessible to people of color. It is important that the city make a deliberate push to show marginalized folks how climate change negatively affects the community."

Additional Quotes from the Survey

"Encouraging and facilitating a change toward a more plant based diet is probably the most important thing an individual can do to reduce their contribution to climate change."

"Be more inclusive to those who don't necessarily embrace the majority opinions...We need discussions about the human aspects of sustainability–the beauty that we lose by using products and approaches that aren't as they should be...We need to integrate our values with our natural human quest for beauty."

"Behavior changes when culture and infrastructure change."

"In my experience, the City has a number of conflicting policies and rules that work against the promotion of energy efficiency and climate protection. I also think that the City needs to work with economic development folks throughout the corridor, and create a real alternative to commuting to Linn County in private vehicles. 1000s of people commute every day. Either create functional mass transit, or create living wage jobs in Iowa City."

"Let's be leaders."

"Thanks for addressing this critical problem locally."

"Culture. For Iowa City to meaningfully reduce its carbon footprint, the City operations, University, industry, developers/landlords, and businesses all need to take part. When these actors lead the way, combined with a public promotion/celebration of their efforts and successes, will help build a culture of reducing our climate impact...Resilience. Connect the dots for people on how this climate action plan will build resilience in the community. (E.g. City facilities that have had energy audits and upgrades will better weather extreme temps and use less fuel when prices spike.)"

"I strongly urge the City to go out into the community to inform. Holding workshops etc only downtown or in the 'usual places' does not encourage dialogue or participation. It is the City's responsibility to meet with residents, not for residents to always take the initiative to meet with the City."

Survey Results *as reported by SurveyMonkey® - 799 respondents*

Q1 What is your affiliation to Iowa City? (Check all that apply).

Answered: 799 Skipped: 1

ANSWER CHOICES	RESPONSES	
Live and own a home in Iowa City	61.20%	489
Live and rent in Iowa City	20.78%	166
Work in Iowa City full-time	37.67%	301
Work in Iowa City part-time	13.39%	107
University of Iowa student	12.52%	100
Kirkwood Community College student	2.63%	21
Own a business in Iowa City	7.26%	58
Other (please specify)	8.01%	64
Total Respondents: 799		

Q2 How long have you lived or worked in Iowa City?

Answered: 795 Skipped: 5

ANSWER CHOICES	RESPONSES	
0-5 years	26.04%	207
6-10 years	15.35%	122
11-15 years	9.69%	77
16-20 years	7.80%	62
20+ years	41.13%	327
TOTAL		795

Survey Results *as reported by SurveyMonkey® - 799 respondents*

Q3 How often do you think about climate change? (Select one option).

Answered: 795 Skipped: 5

ANSWER CHOICES	RESPONSES	
Everyday	53.46%	425
Once a week	26.04%	207
Once a month	8.93%	71
A couple of times a year	7.55%	60
Never	4.03%	32
TOTAL		795

Q4 How well informed do you think you are about the effects of a changing climate in Iowa City? (Select one option).

Answered: 798 Skipped: 2

ANSWER CHOICES	RESPONSES	
Well-informed	25.69%	205
Moderately informed	38.72%	309
Somewhat informed	26.07%	208
I don't know much about it	9.52%	76
TOTAL		798

Survey Results *as reported by SurveyMonkey® - 799 respondents*

Q5 Please rate your level of concern about the following climate change impacts and how they will affect your quality of life and the Iowa City community. (1 being a top priority).

Answered: 797 Skipped: 3

	1	2	3	4	5	6	7	8	9	10	TOTAL
Increased flooding	30.53% 243	18.59% 148	11.56% 92	6.66% 53	6.28% 50	2.89% 23	4.40% 35	5.03% 40	5.15% 41	8.92% 71	796
Precipitation extremes	24.71% 195	19.01% 150	14.83% 117	6.59% 52	5.83% 46	4.82% 38	5.83% 46	5.96% 47	4.18% 33	8.24% 65	789
Temperature changes	21.34% 169	19.44% 154	15.53% 123	7.45% 59	8.08% 64	3.91% 31	5.18% 41	5.68% 45	5.68% 45	7.70% 61	792
Seasonal variations	16.14% 127	16.39% 129	17.41% 137	9.02% 71	8.64% 68	5.34% 42	6.73% 53	6.61% 52	5.34% 42	8.39% 66	787
Impacts on agriculture and food production	33.29% 263	17.97% 142	11.77% 93	6.08% 48	3.80% 30	3.54% 28	3.54% 28	4.56% 36	6.33% 50	9.11% 72	790
Loss of habitat/species	35.30% 281	14.95% 119	11.56% 92	7.54% 60	4.52% 36	3.02% 24	2.89% 23	3.89% 31	6.28% 50	10.05% 80	796
Decreased air quality	33.12% 263	17.13% 136	10.71% 85	6.68% 53	4.79% 38	2.90% 23	4.79% 38	5.29% 42	5.16% 41	9.45% 75	794

Survey Results *as reported by SurveyMonkey® - 799 respondents*

Q6 What actions are you currently taking to reduce the impacts of climate change? (select all that apply).

Answered: 793 Skipped: 7

ANSWER CHOICES	RESPONSES	
Getting informed and involved. For example, joining an organization, reading a book, attending a workshop.	47.04%	373
Reducing consumption of electricity. For example, using energy-efficient products, turning off lights or appliances when not in use, reduced use of appliances and electrical devices.	85.37%	677
Reducing water consumption. For example, reducing water usage, installing water saving devices.	57.25%	454
Reducing waste. For example, reusing, recycling, and composting.	93.06%	738
Reducing fuel consumption. For example, minimize travel by car and/or plane, drive energy/fuel efficient car, use public transportation, bike or walk.	61.03%	484
Buying local goods and products. For example, growing your own food, buying local produce, buying from local businesses.	69.86%	554
Buying greener products. For example, organic produce, products with less/no packaging.	62.67%	497
Reducing consumption by buying less	55.74%	442
Eating a plant-based diet or choosing foods that have a lower carbon footprint	41.24%	327
Other (please specify)	9.21%	73
Total Respondents: 793		

Survey Results *as reported by SurveyMonkey® - 799 respondents*

Q7 What topics would you like to learn more about? (select your top 5 topics).

Answered: 762 Skipped: 38

ANSWER CHOICES	RESPONSES	
Energy efficiency in residential and commercial buildings	62.34%	475
Renewable energy alternatives	64.70%	493
Using less natural gas	33.20%	253
Water conservation	45.67%	348
Transportation efficiency such as using public transport or carpooling	22.44%	171
Alternative transportation choices such as biking and waking	21.00%	160
Waste diversion through composting and reusing	51.44%	392
Recycling	41.73%	318
Consumption reduction – food, goods, and products	48.03%	366
Plant-based diet and the carbon footprint of food	33.33%	254
Total Respondents: 762		

Q8 What do you see as barriers to strategies for addressing climate change?

Answered: 793 Skipped: 7

ANSWER CHOICES	RESPONSES	
Lack of public information and education	52.59%	417
Cost of implementation	48.55%	385
Difficulty in changing behavioral habits	77.81%	617
Lack of business or industry support	52.46%	416
Public-private coordination	33.04%	262
Uncertainty	19.42%	154
Other (please specify)	18.28%	145
Total Respondents: 793		

Survey Results *as reported by SurveyMonkey® - 799 respondents*

Q9 What tools and resources could be helpful to you in reducing your climate impact? (Rank in order of importance).

Answered: 749 Skipped: 51

	1	2	3	4	5	6	TOTAL	SCORE
Workshops	15.52% 106	10.10% 69	14.93% 102	15.08% 103	18.74% 128	25.62% 175	683	3.12
Informational fact sheet	14.45% 99	20.73% 142	19.27% 132	19.12% 131	15.77% 108	10.66% 73	685	3.67
Tips for home and business	33.71% 237	26.46% 186	19.06% 134	10.10% 71	7.11% 50	3.56% 25	703	4.59
Case studies	6.99% 48	12.66% 87	17.47% 120	18.34% 126	21.25% 146	23.29% 160	687	2.96
Climate science FAQs	9.77% 68	13.79% 96	16.95% 118	22.13% 154	23.71% 165	13.65% 95	696	3.23
GHG calculators (calculating your own carbon "footprint")	24.86% 175	18.04% 127	12.93% 91	13.49% 95	11.36% 80	19.32% 136	704	3.74

Q10 How do you want to learn about climate change and Iowa City's Climate Action and Adaptation Plan? (Check all that apply).

Answered: 781 Skipped: 19

ANSWER CHOICES	RESPONSES	
Community workshops	43.41%	339
City of Iowa City website, www.icgov.org	67.09%	524
E-subscriptions, or email news bulletins	56.47%	441
Facebook	42.64%	333
Twitter	14.85%	116
Nextdoor	18.44%	144
Instagram	11.78%	92
LinkedIn	2.43%	19
YouTube	19.21%	150
City Channel 4 cable TV station	14.08%	110
Other (please specify)	9.48%	74
Total Respondents: 781		

Survey Results *as reported by SurveyMonkey® - 799 respondents*

Q11 Would you be interested in participating in future projects associated with Iowa City's Climate Action and Adaptation Plan?

Answered: 776 Skipped: 24

ANSWER CHOICES	RESPONSES	
Yes	65.72%	510
No	34.92%	271
Total Respondents: 776		

Q12 What is your address?

Answered: 636 Skipped: 164

Q13 What is your age group?

Answered: 722 Skipped: 78

ANSWER CHOICES	RESPONSES	
Under 18	0.69%	5
18-24	14.27%	103
25-34	18.14%	131
35-44	17.87%	129
45-54	14.27%	103
55-64	16.34%	118
65 or older	18.42%	133
TOTAL		722

Survey Results *as reported by SurveyMonkey® - 799 respondents*

Q14 What is your race?

Answered: 722 Skipped: 78

ANSWER CHOICES	RESPONSES	
White	89.89%	649
Asian	2.35%	17
Black or African-American	1.11%	8
Hispanic or Latino	1.94%	14
Native American or Alaskan Native	0.14%	1
From multiple races	2.08%	15
Other (please specify)	2.49%	18
TOTAL		722

Q15 What is your gross annual household income?

Answered: 725 Skipped: 75

ANSWER CHOICES	RESPONSES	
$0-$24,999	13.66%	99
$25,000-$49,999	15.17%	110
$50,000-$74,999	16.00%	116
$75,000-$99,999	12.55%	91
$100,000-$149,999	16.41%	119
$150,000-or more	13.52%	98
Not sure/prefer not to answer	12.69%	92
TOTAL		725

Q16 Do you have any other comments or suggestions?

Answered: 277 Skipped: 523

Stakeholder Interviews

A series of stakeholder interviews were conducted in July and August 2017. Not all individuals and organizations contacted resulted in a scheduled interview due to scheduling conflicts or unavailability. Below is the list of external and internal interviews conducted at the beginning of the planning process.

External

Name	Organization/Affiliation (if application)
Ryan Sempf	Iowa City Area Chamber of Commerce; Steering Committee Member
Martha Norbeck	C-Wise; Steering Committee Member
Nancy Bird	Iowa City Downtown District
Duane Van Hemert	Iowa City Community School District - Operations Department
Sara Maples	University of Iowa Office of Sustainability
Becky Ross	100 Grannies
Eric Johnson	Iowa City Climate Advocates
Pete Rolnick	Iowa City Climate Advocates
Rafael Moratoya	Center for Worker Justice
GT Karr	Homebuilders Association; Steering Committee Member

Internal

Name	City Title/Department
Tracy Hightshoe	Neighborhood & Development Services Coord.
Stan Laverman	Senior Housing Inspector
Geoff Fruin	City Manager
Karen Howard	Associate Planner
Ron Knoche	Public Works Director
Jason Havel	City Engineer
Tim Wilkey	Wastewater Superintendent
Kevin Slutts	Water Superintendent
Jen Jordan	Solid Waste Superintendent
Jon Resler	Streets Superintendent
Dan Striegel	Equipment Superintendent
Wendy Ford	Economic Development Coordinator
Marcia Bollinger	Neighborhood Outreach/Neighborhood Council
Kumi Morris	Facilities Manager
Mark Rummel	Acting Transportation Director
John Yapp	Development Services Coordinator
Tim Hennes	Sr. Building Inspector
Bob Miklo	Sr. Planner
Kent Ralston	Executive Director, Johnson County MPO
Zachary Hall	Parks Superintendent
Stefanie Bowers	Equity Director

Summary of Actions – Expanded Table

The table below is an expanded version of the table on pages 22 through 24, and includes these additional categories: type of action; implementation and potential partner agencies. Actions marked with a star are high priority action items.

	Action	Type of Action	Sector (H, W, G)	Implementation	Cost	Local GHG Impact	Partner Agencies
Buildings							
1.1	*Increase energy efficiency in residences	Program, Education	H	Short to Mid	$-$$$	●●●	MidAmerican; local contractors; lenders
1.2	*Increase energy efficiency in businesses	Program, Education	W	Short to Mid	$-$$$	●●●	Local businesses; local/regional business coordinating agencies, Univ.
1.3	*Increase energy efficiency in new buildings	Policy, Plan	HWG	Mid to Long	$	●●●	City; University; Developers; HBA
1.4	*Increase on-site renewable energy systems and electrification	Study, Education	HWG	Mid	$$	●●●	City; Iowa Renewable Energy Association; Developers
1.5	Initiate community solar projects[1]	Project, Partnership	HW	Mid	$$$	●	City; MidAmerican
1.6	Support energy benchmarking tools	Policy	HWG	Short	$	●	Advocacy groups; City
1.7	*Continue to increase energy efficiency in City-owned buildings[2]	Lead by example	G	Short to Mid	$-$$$	●	City
Transportation							
2.1	*Increase use of mass transit systems	Lifestyle, Program	HWG	Short	$-$$$	●●	City; Univ.; County; Advocacy groups
2.2	*Embrace electric vehicles, alternative fuel vehicles, and other emerging technologies	Lifestyle, Policies, Partnership	HWG	Mid	$$	●●●	City; University, Advocacy groups
2.3	*Increase bicycle and pedestrian transportation	Lifestyle, Program	HWG	Short	$	●●	City; County; University; Advocacy groups
2.4	*Increase compact and contiguous development	Policy, Plan	G	Mid to Long	$$	●	City; developers
2.5	*Increase employee commuter options	Partnership	W	Short to Mid	$	●●●	University; Large businesses, East Central Iowa Council of Governments (ECICOG)
2.6	Manage parking options	Policy, Partnership	WG	Mid	$$	●	City
2.7	Reduce the City's vehicle emissions footprint[2]	Lead by example	G	Short to Mid	$$	●	City

Summary of Actions – Expanded Table *continued*

	Action	Type of Action	Sector (H, W, G)	Implementation	Cost	Local GHG Impact	Partner Agencies
Waste							
3.1	Increase recycling at multi-family properties	Lifestyle, Education, Program	HG	Short	$	•	City; Advocacy groups
3.2	Increase composting of organics	Lifestyle, Education, Program	HWG	Short	$	•	City; University; Advocacy groups
3.3	*Reduce waste at the source	Lifestyle, Education	HW	Short	$	•	Advocacy groups; City (education)
3.4	Establish partnerships to divert construction waste from the Landfill	Program	WG	Mid	$$	•	City; Developers; HBA
3.5	Reduce waste at City facilities[2]	Lead by example	G	Short	$	•	City
3.6	Create a comprehensive waste management plan	Plan	G	Mid	$	•	City
3.7	*Take action on a study to efficiently capture and use methane from wastewater operations	Study, Project	G	Mid to Long	$	•	City
3.8	*Take action on a feasibility study on energy generation from landfill methane	Study, Project	G	Mid to Long	$$$	••	City
Adaptation							
4.1	Conduct a vulnerable populations asset mapping exercise	Study	G	Short	$	•	City; Advocacy groups
4.2	*Develop communications and outreach plan for vulnerable populations	Plan	G	Short to Mid	$	•	City; Advocacy groups
4.3	Analyze climate-related public health impacts in Iowa City	Study	G	Short	$	•	City; County
4.4	*Coordinate extreme weather preparedness planning with local agencies	Plan	G	Short to Mid	$	•	City; County
4.5	Assess Citywide and neighborhood stormwater management	Project	G	Mid	$	•	City
4.6	Expand Iowa City's tree canopy		G	Mid to Long	$$	•	City; developers

Summary of Actions – Expanded Table *continued*

	Action	Type of Action	Sector (H, W, G)	Implementation	Cost	Local GHG Impact	Partner Agencies
Sustainable Lifestyle							
5.1	*Encourage a plant-rich diet[3]	Lifestyle, Education	H	Short	$	•••	City; Advocacy groups
5.2	Expand community gardens and access to healthy, local foods	Project	HG	Mid	$$	•	City; Advocacy groups
5.3	Encourage the purchase of local products and responsible purchasing	Lifestyle, Education	HWG	Short	$	•	City; local/regional business coordinating agencies; Advocacy groups
5.4	*Create funding mechanisms to support community-wide climate action	Program	G	Short to Mid	$$$	•	Local/other lenders; Local interest/advocacy groups
5.5	*Incorporate this Climate Plan into the City's sustainability communications	Plan	G	Short	$	•	City
5.6	Initiate a green recognition program	Program G	HWG	Short	$	•	City; local/regional business coordinating agencies; Local interest/advocacy groups
5.7	Develop internal City sustainability operations guide	Lead by example	G	Short	$	•	City

Table Definitions:

Action: Description of the proposed strategy or action

Type of Action: Type of action being proposed within the following categories: Education, Program, Partnership, Policy, Study, Lifestyle, Plan, Project, and Lead by Example.

Sector: The type of building or individual where the action can be implemented; home, work or (city) government

Implementation period: The time it will take to begin implementing this action; Short term: within 1-2 years; Mid-term: within 5 years; Long term: within 5+ years

Cost: The comparative cost of implementing each action on a scale of $ through $$$. Note that the costs can be borne by a variety of stakeholders.

Impact: The comparative emissions impact on Iowa City emissions that result from the implementation of each action on a scale of * through *** rating. Impact ratings are ranked in their ability to reduce Iowa City GHG emissions based on the 2015 Iowa City Community-wide Greenhouse Gas Inventory.

Additional Table Notes:

1. Because Iowa City's electricity source will be 100 percent renewable by the end of 2020, the actual emissions reduction for community solar activities will be minimal.
2. The impact of City government buildings, vehicle fleet, and waste reduction activities alone as separate actions is minimal on Iowa City's community-wide emissions profile. However, the City strongly believes in leading by example and taking action, just like others in the community. The incremental actions of each individual person, business, and organization will allow us to achieve our overall community-wide targets.
3. While the immediate impact on emissions in Iowa City may be relatively small, the global impacts related to eating more plants and less meat result in a very high impact.

Endnotes

1. National Oceanic and Atmospheric Administration (NOAA) Global Climate Report – January 2018
2. The 10 Hottest Global Years on Record. Climate Central. January 18. 2018. www.climatecentral.org/gallery/graphics/the-10-hottest-global-years-on-record.
3. Climate in the Heartland. Heartland Regional Network of the Urban Sustainability Directors Network. September 2015.
4. 2015 States at Risk. Climate Central. Access date: March 8, 2018 http://statesatrisk.org/iowa/extreme-heat.
5. Climate in the Heartland. Heartland Regional Network of the Urban Sustainability Directors Network. September 2015.
6. "Scientific Consensus: Earth's Climate is Warming." National Aeronautics and Space Administration (NASA) Access date: June 11, 2018. https://climate.nasa.gov/scientific-consensus/
7. Note: The Compact of Mayors has since joined with another organization to become the Global Covenant of Mayors
8. "Compact of Mayors: The biggest collaboration to accelerate climate action." www.uclg.org/en/node/23789
9. Note: In June 2017, the City released an update to the community-wide GHG inventory in the form of a Community-wide Greenhouse Gas Emissions Report that is available on the city's website www.icgov.org/climateaction.
10. Note: This is an imperfect comparison as this municipal GHG inventory includes landfill emissions for waste from all Johnson County residents, while the community inventory only includes emissions from waste produced by residents in Iowa City.
11. Note: www.icgov.org/project/iowa-city-climate-action-and-adaptation-plan#Greenhouse%20Gas%20Reports
12. ecocity Footprint Tool Pilot, Iowa City Summary Report. Urban Sustainability Directors Network. December 2017.
13. Note: A global hectare is a biologically productive hectare with globally averaged productivity for a given year. It is an estimate of how much biologically productive land and water area an individual or population needs to produce all the resources it consumes and to absorb the wastes it generates.
14. ecocity Footprint Tool Pilot, Iowa City Summary Report. Urban Sustainability Directors Network. December 2017.
15. Guide to Equitable, Community Driven Climate Preparedness Planning. Urban Sustainability Directors Network. May 2017.
16. Note: This figure is an estimate based on forecast information and is not a guarantee of actual wind production. The figure is for planning purposes only and cannot be relied on for any claims of renewable energy received.
17. "Lifting the High Energy Burden in America's Largest Cities: How Energy Efficiency Can Improve Low-Income and Underserved Communities." American Council for an Energy-Efficiency Economy. April 2016.
18. "Iowa Takes Huge Step Backward on Energy Efficiency, While Other States Move Ahead." Martin Kushler. May 10, 2018. Access date: May 25, 2018. http://aceee.org/blog/2018/05/iowa-takes-huge-step-backward-energy
19. Let's Get Rolling: Iowa City Bicycle Master Plan. Summer 2017. Page 16.
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23. Iowa Commuter Transportation Study. Iowa Department of Transportation. December 2014. www.iowadot.gov/commuterstudy/
24. Iowa City Downtown and Pedestrian Mall Streetscape Plan Update. February 2014. https://downtowniowacity.com/wp-content/uploads/2016/08/2014.02-IC-DT-Streetscape-Master-Plan-Report.pdf
25. Iowa City Routes. Bongo-Bus on the Go. Access date: March 15, 2018. www.bongo.org/routes/iowa-city/
26. SEATS Paratransit Service. Access date: March 15, 2018. www.icgov.org/city-government/departments-and-divisions/transportation-and-resource-management/transit/seats

27. Transit Network, Metro Area Transit Network. Access date: March 15, 2018. www.livablecommunity.org/Handler.ashx?Item_ID=B3B3F06A-CEF8-4BFD-8467-1F7D443498AB
28. Let's Get Rolling: Iowa City Bicycle Master Plan. Summer 2017. Page 44.
29. Iowa City Downtown and Pedestrian Mall Streetscape Plan Update. February 2014. Page 150, Prioritization chart.
30. Iowa City Comprehensive Plan. Access date: March 15, 2018. www.icgov.org/city-government/departments-and-divisions/neighborhood-and-development-services/development-services/urban-planning/comprehensive-and-district-planning.
31. Note: The City has set aside funds in 2018's budget to add two EV charging stations to visible public parking facility locations.
32. Note: Even though the landfill accepts waste from all of Johnson County, Iowa City's community-based greenhouse gas inventory only accounts for the percentage of waste generated by the Iowa City population.
33. "Municipal Solid Waste." U.S. Environmental Protection Agency. Access date: March 25, 2018. https://archive.epa.gov/epawaste/nonhaz/municipal/web/html/
34. "All Iowa City apartment buildings will start offering recycling this year." Little Village. January 8, 2018. http://littlevillagemag.com/iowa-city-apartments-recycling-mandate/
35. 2017 Iowa Statewide Waste Characterization Study. Iowa Department of Natural Resources. December 2017. Page 16.
36. Note: Assumes tons reported in Waste Characterization Study are US tons, i.e. 2000 lbs., and Johnson County population of 144,251 (2015)
37. ecocity Footprint Tool Pilot, Iowa City Summary Report. Urban Sustainability Directors Network. December 2017.
38. Apartment Recycling Pilot Program. Access date: March 22, 2018. www.icgov.org/recycling#Apartment%20and%20Business%20Recycling
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40. Iowa City Natural Areas Inventory and Management Plan. January 2018. www8.iowa-city.org/weblink/0/edoc/1781877/IA%20City%20NAI%20Final%20Report_reducedsize.pdf
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