AGENDA
CITY OF CEDAR FALLS, IOWA
MEETING OF STANDING COMMITTEES
MONDAY, MAY 16, 2022
5:10 PM AT COMMUNITY CENTER, 528 MAIN STREET

Call to Order

Roll Call

Community Relations & Planning Committee

1. Resilience Plan - Final Report.
   (60 Minutes, Planner III Thomas Weintraut)

2. River Placemaking Proposal & Destination Iowa Grant Opportunities.
   (40 Minutes, Grow Cedar Valley Senior Program Director Danny Laudick and INRCOG Community Planner Isaiah Corbin)

DEPARTMENT OF COMMUNITY DEVELOPMENT

City of Cedar Falls
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MEMORANDUM

Planning & Community Services Division

TO: Honorable Mayor Robert M. Green and City Council

FROM: Thomas Weintraut, Planner III

DATE: May 9, 2022

SUBJECT: Cedar Falls Resilience Plan

In June 2020, the City of Cedar Falls approved a contract with Perkins & Will to draft a Resilience Plan. The goal of the Resilience Plan is to develop local solutions to better position the community economically and environmentally and make Cedar Falls more resilient in the face of unexpected events, such as the 2019 derecho which had a devastating impact on Cedar Rapids, while continuing to provide a high quality of life for all citizens.

Due to the 2019 coronavirus outbreaks and restrictions on holding large public gathering in enclosed spaces, the planning process was hosted through a series of virtual meetings, online surveys, workshops, and worksheets. The plan kicked off in September 2020 with the formation of a Core Team made up of citizens, CFU & UNI representatives, and city staff to guide the planning process. The Core Team focused on six topic areas to include in the planning process. A steering committee of community members was formed to provide a community wide perspective on each of the six topics. Those six topic areas were: Ecology, Land and Habitat; Water, Weather and Urban Flooding; Energy, Mobility and Waste; Community Cohesion and Civic Services, Equity, Diversity and Well-being; and Jobs, Business, and Economy.

In Fall 2020, two online surveys were posted to gather input from the community and those responses were used to create a series of six online workshops to gather public feedback from the surveys. The resulting data from the initial planning process was presented at a virtual Town Hall meeting on November 10, 2020. In December 2020 the responses from the Town Hall meeting were used to create an online worksheet and two online surveys to further refine the planning process. The responses to the worksheet and surveys were then used to create two additional worksheets which were made available in January 2021 and March 2021.

In April 2021, Doug Pierce of Perkins & Will began preparing the draft plan. The Core Team worked with Doug to finalize a final draft of the plan which was completed in November 2021 and because of the holiday season, a public meeting would be held in

late January 2022. Because of the increase in the spread of the Omicron variant of the coronavirus, the Core Team decided to put off a public meeting until case levels declined. On April 12, the City hosted a public presentation of the plan at the Community Center. There were approximately 30 people, including staff at the meeting.

If you have any questions regarding this project, please contact the Community Development Department.

xc: Stephanie Sheetz, Community Development Director
Karen Howard, Planning and Community Services Manager

Cedar Falls

Resilience Plan

Commitment & Creativity for a Better Tomorrow

Forward

Opening Statement about the Plan | May 2022

We live in a rapidly changing world. To be a community that is proactive, prepared, and flexible in the midst of change, is to be resilient. This resilience plan provides an action guide that not only utilizes existing community plans and actions, but also includes sought after community involvement to identify additional actions needed to improve our prosperity and stability.

The Cedar Falls Resilience Plan is community-based and comprehensive. Its purpose is to identify actions needed as a community, supporting a collective goal to be a resilient community. While individual actions are very important, the community must work on policy decisions that require broad-based community support to achieve. This plan focuses on those decisions to establish community consensus on the priorities for broad-based actions.

The Action Plan starts on page 73. It is divided into actions focused on Local Economics & Community, Weather & Nature, as well as Energy & Mobility. Information included before the Action Plan, describes each focus area and provides data. Page 13 outlines the public participation and engagement work for each focus area that is integral to the development of the Cedar Falls Resilience Plan. The planning team would like to thank everyone who participated for engaging in the online workshops, town hall meetings, survey, and worksheets.

Some plan outcomes are the City of Cedar Falls' direct responsibility to execute as a government entity. Many other outcomes are actions that only a diverse group of community members, businesses, and Cedar Falls organizations can effectively pursue. We hope you will participate as we collectively sketch an inspiring present and future for our Cedar Falls community.

The City of Cedar Falls funded and facilitated the Resilience Plan beginning in the fall of 2020 with completion in the spring of 2022. The consulting team Perkins&Will assisted the City of Cedar Falls with plan development by synthesizing the multiple perspectives, concepts, and ideas into a composite approach to community-wide resilience.

Acknowledgements

Mayor
Robert Green

City Council
Frank Darrah, Susan deBuhr, Kelly Dunn
Simon Harding, Daryl Kruse, Mark Miller, Dave Sires

Core Team Members
Ron Gaines, City Administrator
Eric Giddens, Energy, Education & Outreach Coordinator, UNI
Brady Gruhn, Citizen Member
Mike Litterer, Director, Customer Services and Business Development, Cedar Falls Utilities
Mark G. Miller, Citizen Member
Mike Nyman, Water Reclamation Manager, City
Maria Perez, Stormwater Specialist, City
Jennifer Rodenbeck, Director of Finance & Business Operations, City
Stephanie Houk Sheetz, Director of Community Development, City
Thomas Weintraut, Planner III, City
Carole Yates, Citizen Member

Community Stakeholder Groups

Jobs, Business and Economy
Cary Darrah, Grow Cedar Valley
Ethan DeWall, VP Martin Brothers
Crystal Ford, Former President, Cedar Falls Community Main Street
Jeff Hassman, Citizen Member
Kathryn Sogard, Executive Director, College Hill Partnership
Francesca Valdivia, Amigo's

Community Cohesion and Civic Services
Mike Butler, Rotary
Leslie Nixon, Chair, Parks and Recreation Commission
Leslie Prideaux, Visitors and Tourism Board
MaraBeth Soneson, Cedar Falls Utilities Trustee
Sasha Wolpert, Cedar Falls School Board

Equity, Diversity and Well-being
Tom Blanford, Collins Holding Company
Scott Dickinson, Pathways Mental Health
Teri Lynn Jorgenson, Human Rights Commission, City
Keyah Levy, Director, Center for Multicultural Education, UNI
Spencer Luvert, Human Rights Commission, City
Lindsay Pieters, Former Housing Commission Member, City
Jim Young, Citizen Member

Water Weather and Urban Flooding
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Kamyar Enshayan, CEEE Director, UNI
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Dan Meier, Seed Library, Cedar Falls Public Library
Laura Walters, Tallgrass Prairie Center
Jim Weimer, Black Hawk County Conservation

Energy, Mobility and Waste
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Jesse Linzer, Emergent Architecture
Eric O'Brien, Sustainability Director, UNI
David Sturch, Director, Metropolitan Transit Authority
Glynis Worthington, Citizen Member

Table of Contents

Resilience Today

Resilience Today In Cedar Falls

Introduction

The City of Cedar Falls, the University of Northern Iowa (UNI), and Black Hawk County have long recognized the importance of working together to benefit the community. Many of the Actions listed in this plan are a continuation of previous plans, policies and actions implemented by the City, UNI, and Black Hawk County with community support.

The following section will provide a brief overview of previous efforts by the City, UNI, and Black Hawk County. This list is intended to be an overview of current actions that support the Resilience Plan and not a comprehensive list. In addition, many individuals and community organizations worked behind the scenes to helped make Cedar Falls resilient.

Flooding and Stormwater:
The City first adopted a floodplain ordinance in 1985 which allowed the City's participation in the National Flood Insurance Program. In 2010, the Floodplain Ordinance was revised to require all new construction and substantial improvements to existing buildings to be protected to one foot above the 500-year flood elevation. The City works with State and Federal partners to purchase residential properties within the floodplain. To lessen the impact of stormwater run-off and localized flooding, the City began has started basin studies to determine what infrastructure may be needed when streets and alley improvements are made.

Transportation and Energy:
The City has hybrid and electric vehicles in its pool fleet as well as its Public Safety and Parking Operations divisions and in 2021 the City purchased an all-electric mower. The City adopted a Bike Plan in 2019. To be more bicycle friendly, the City and has installed approximately five miles of shared auto/bike lane markings, or sharrows, and bike lanes since 2007. The Metropolitan Transit Authority added bike racks to buses in 2008. Cedar Falls Utilities has programs to help customers reduce their energy footprint and energy costs. Cedar Falls Utilities also partners with Cedar Falls TREES, a non-profit organization, to promote tree planting for energy and environmental conservation.

Environment and Waste:
The City of Cedar Falls completed an Environmentally Sensitive Lands Survey in 2007 to provide guidance for land use planning and policy decision making. In addition, the City annually plants trees in parks, the public right-of-way, and as part of street improvement projects and replaces ash trees affected by the emerald ash bore. The City supports the use of native plants to reduce mowing and provide wildlife and pollinator habitat. The City was named a Bird Friendly Community in 2021. The City is a partner with other organizations working to improve the Dry Run Creek Watershed. The City has actively worked to reduce the amount of waste going to the Black Hawk County Landfill by providing a wide range of recycling sites for the community.

Resilience Today In Cedar Falls

City Resilience Efforts In The Past 15 Years

Stormwater

- The City adopted stormwater fees in 2006.
- The first permeable alley was constructed in 2014 with a total of 17 alleys installed by 2021. Permeable alleys are a tool to reduce stormwater runoff by allowing water to infiltrate into the ground.
- The City has installed over 50 bioretention cells. Bioretention cells are landscape depressions the capture and filter stormwater runoff from impervious surfaces reducing runoff and water pollution. Below is a list of bioretention cell locations.
    - 8 Silva Cells in the College Hill area.
    - Waterloo Road/State Street area
    - Clay Street at 7th and 8th Streets
    - Grand Boulevard near Pfeiffer Park
    - 14th Street near Waterloo Road
    - East Street
    - Pleasure Ridge Golf Course
    - Cedar Falls Public Works Facility
    - Grove Street near Peet Junior High
- The City has also done three stream bank restorations:
    - Dry Run Creek west of the Lions Field in 2014.
    - Dry Run Creek between Merner Ave and College St in 2015.
    - Dry Run Creek west of Greenhill Road and South of University Ave, in 2018.
- The City has provided 30 rain barrel kits since 2020 through community events.

City use of Electric vehicles

- 2006-2008 hybrid vehicles purchased. These were phased out as they aged.
- The city currently operates one hybrid vehicle in its pool vehicle fleet, a hybrid marked patrol SUV in its Public Safety division and a fully electric vehicle in the Parking Operations division.

Electric Vehicles *continued*

- The City is anticipating adding at least one additional hybrid or full electric vehicle each year moving forward.
- In 2021, the City purchased an all-electric mower for use in its parks/rights of way.

Flooding

- Riverine
- 2010 revised ordinances to reduce risk to those building in the floodplain:
    - Require new buildings to be built with a finished floor elevation 1' above 500-year level (vs. typical of 1' above 100-year).
    - Restricts the creation of new lots in the floodplain with more than 25% of the area of a new lot in the floodway finge (to reduce the number new buildings in floodplain).
    - No LOMAs – to avoid filling on a lot and creating the home with a moat.
- Buyout program – The City continues to budget for buyouts and partners with State/Federal governments for grants to voluntarily purchase residential properties in floodway and floodplain.
- Flash flooding
    - Started developing drainage basin studies in 2018, with the first, Clay Street Park study completed in 2019, to determine flows and what infrastructure may be needed (missing or upgrades) when the City reconstructs a road or alley.
    - Received an Iowa Recreation Enhancement and Protect grant in 2019 to supported detention basin & permeable alley project in Clay Street Park to reduce flooding to adjacent properties immediately downstream.

Resilience Today In Cedar Falls

City Resilience Efforts *continued*

Environment

- Tree planting
    - The City annually plants 200 trees. In addition, the City planted 150 trees as part of the Lone Tree Road project in 2018-2019, 64 trees as part on the Prairie Parkway roundabout in 2019, 128 trees as part of the University Avenue improvement in 2016-2019 and 40 to be trees planted along Center Street as part of the North Cedar Neighborhood improvements in 2022.
    - Since 2018, The City has replaced 500 ash trees on city property decimated by the emerald ash bore.
- The City has installed pollinator plantings along the levee and on numerous flood buy out properties achieving two objectives: no need to mow (reducing associated pollution) and providing habitat for pollinators.
- The City has not sprayed for mosquito in over 20 years.
- Bird Friendly (2021) - North Cedar Neighborhood Association submitted nomination and Cedar Falls awarded the bird friendly status.
- In 2017, the City updated an ordinance to allow the use of native plants, prairie grass areas, wildflower planting areas, and urban woodlots in yards & rights-of-ways.
- The City of Cedar Falls has partnered with the Dry Run Creek Watershed Improvement Project and the Black Hawk Soil and Water Conservation District to implement 72 conservation practices (52 bioretention cells, 13 permeable pavement projects, 3 streambank stabilizations, and 4 wetland creations/restorations). These conservation projects are treating 134 acres of land, accumulating in over 22 million gallons of stormwater being treated each year.
- In 2007, the City adopted an Environmentally Sensitive Land Survey to help guide land use planning efforts and policy decisions.

Mobility Options

- Bike/Walking
    - The City has approximately 5 miles of Sharrows, streets where bicycles and cares share the same lanes, along the following streets:
    - Boulder Drive between Orchard Drive and Idaho Road in 2014.
        - Boulder Street between Orchard Drive and Idaho Road in 2020.
        - College Street between 12th and 20th Streets between 2014 and 2015.
        - Pheasant Drive between Shelley Lane and 4th Street between 2018 and 2019.
        - Rownd Street between Rainbow Drive and Greenhill Road between 2013 and 2014.
        - Seerley Boulevard between Clay and College Streets between 2007 and 2008.
        - State Street from 4th Street to Waterloo Road between 2017 and 2018.
        - Valley Park Drive between Waterloo Road and University Avenue 2010 and 2011.
        - 12th Street between Tremont and Division Streets in 2020.
        - 18th Street between Clay and College Streets in 2013.Cedar Falls added bike lanes to Clay Street from 1st Street to 15th Street in 2008 and a bike lane to Center Street from Tourist Park to Clair Street in 2013.
    - Cedar Falls added bike lanes to Clay Street from 1St Street to 15th Street in 2008 and a bike lane to Center Street from Tourist Park to Clair Street in 2013.
    - The Metropolitan Transit Authority (MET) added bike racks to buses in 2008

Resilience Today In Cedar Falls

City Resilience Efforts *continued*

- The City adopted a Bike Plan 2019 to increase bike use and to make Cedar Falls more bicycle friendly. The primary objective of the plan was to develop a network which would place every resident with .5 miles of an establish bikeway or multi-use trail.

Waste Reduction City
- The City has recycled Styrofoam since 2015.
- Shingles have been recycled since 2014 with a fee.
- Electronic waste recycling, such as computers and T.V.s, is available.
- Recycling of cardboard, newsprint, magazines, metal food cans, clear and colored glass, office paper, Plastics 1-7 and plastic grocery bags, cooking oil,
- Appliances and tires can be recycled with a fee.
- The City maintains 7 24-hour remote household recycling sites.
- Leaf Vacuum Service is available during October and November for a fee.
- The City has a compost facility which accepts brush, logs, leaves, grass clipping and garden waste. Compost and wood mulch is available to the citizens.
- The City provides weekly curbside yard waste collection for a fee in April, May, June October and November, bi-monthly pickup July through September, and on a call basis December through March.

Energy Reduction
- CFU partners with their customers to make smart energy choices and to help save energy and money. In addition to providing cost-sharing rebates for efficiency upgrades, CFU Energy Services provides comfort consultations, utility bill analysis and energy assessments at no cost to CFU customers.
- Cedar Falls TREES is a non-profit organization working in partnership with Cedar Falls Utilities to promote and support tree planting for energy conservation and environmental benefits. TREES volunteers provide information about tree planting, proper care for trees and the benefits of urban forestation.

- In 2016 Simple Solar, a community solar energy project initiated by Cedar Falls Utilities, was installed and is currently the largest community solar project in Iowa with a total capacity of 1.5 megawatts.

Resilience Programs at the University of Northern Iowa (UNI)

Center for Energy & Environmental Education

Green Iowa AmeriCorps
Green Iowa AmeriCorps (GIA) is Iowa's leader in boots-on-the-ground energy and environmental services. GIA is headquartered at the University of Northern Iowa's Center for Energy & Environmental Education and maintains 20+ sites throughout Iowa. GIA provides services in the following areas:

- **Energy & Community** - The Energy & Community branch helps Iowans (homeowners, tenants and community members) become more energy efficient through residential energy assessments and weatherizations, energy education, and community outreach services.

  Energy & Community uses a team-based approach to provide residential weatherization services as well as energy and environmentally focused education and energy-related community outreach efforts. All energy related services, including labor and materials, are FREE to any individuals who qualify.

Resilience Today In Cedar Falls

Resilience Programs at UNI *continued*

The Energy & Community branch of Green Iowa AmeriCorps has been operational since 2009 and partners regularly with city governments and local and investor owned utilities.

- **Sustainable Schools** - The Sustainable Schools branch serves as a resource and catalyst for Iowa school districts, solid waste agencies, and higher education institutions to build a more energized and sustainable future. Sustainable Schools members serve as sustainability coordinators and work to reduce district-wide energy costs, evaluate and improve district solid waste habits, and assist teachers and staff in implementing environmental project-based learning initiatives for students. Sustainable Schools members support cities and districts to create climate action plans, organizing environmental student organizations, and involving high school students in service positions each summer. Sustainable Schools is currently partners with both Cedar Falls CSD and the Black Hawk County Solid Waste Commission in Black Hawk County and has been operational since 2017.
- **Land & Water Stewards** - The Land and Water Stewards branch is dedicated to restoration and conservation of Iowa's native habitats and natural resources. Members are focused on conserving and restoring Iowa's lost ecosystems and water quality and quantity issues by serving directly at our different Green Iowa AmeriCorps host sites. LWS members facilitate environmentally focused educational programs and engages community members in service projects. Members complete tree planting projects, remove invasive species, install rain gardens, conduct water quality monitoring, and are available for climate related disaster responses like the flooding events that are becoming more prevalent in Iowa. Land & Water Stewards are currently serving at the Center for Energy & Environmental Education as well as the Tallgrass Prairie in Cedar Falls. The branch and has been in operation since 2018.

Community Energy/Climate Action Planning
The Center for Energy & Environmental Education (CEEE) assists local governments in our region with developing community-wide greenhouse gas emissions inventories and emissions reduction plans. These services are offered to interested local governments in Iowa for a nominal fee. The CEEE staff, Cassie Sonne leads this work and trains Green Iowa AmeriCorps members and CEEE student interns from the University of Northern Iowa in climate action planning and energy saving across all scales, from schools and small businesses to municipalities. AmeriCorps members and student interns gain valuable experience and marketable skills while working on this program, and participating communities receive data about their emissions as a basis to develop a community energy/climate action plan specially designed for them.

Community energy plans aim to:
- Reduce energy consumption and greenhouse gas emissions in communities
- Inform public officials during goal setting and budget decisions, focusing on reduction strategies over which local governments have control, and
- Focus community leaders on developing plans towards conservation and community resilience

The CEEE is a member of the International Council for Local Environmental Initiatives (ICLEI) and uses ICLEI's ClearPath software to create community energy plans. ICLEI is the leading global network of local governments dedicated to sustainability, resilience, and climate action. CEEE staff Cassie Sonne also convenes the Iowa Sustainable Communities program, which

Resilience Today In Cedar Falls

Resilience Programs at UNI *continued*

encourages communities to go beyond greenhouse gas reduction measures into broader sustainability actions. This creates a connection between energy conservation and further environmental and community improvements.

UNI Local Food Program
The UNI Local Food Program works to develop a local and regional food system that positively impacts local farmers, consumers and businesses through education, collaboration, and economic development. The Local Food Program provides the following support:

- **Cedar Valley Regional Food & Farm Network (CVRFFN)** – CEEE staff lead the Cedar Valley Regional Food & Farm Network. A coalition of individuals, food and farm businesses, UNI Local Food Program, Northeast Iowa Food Bank, Iowa State University Extension & Outreach, and other community organizations and leaders working together to positively impact the local food system.

- **Services to Farmers** – Staff help local farms find local markets, build connections among farmers, and offer educational programs to assist direct-marketing farms in the region.

- **Services to Institutional Food Buyers** – CEEE Staff connect schools, grocers, restaurants, and distributors with local farms.

- **Local and Regional Food Systems Education** - CEEE staff and partners develop tools and experiences that make it easier for everyone to see and appreciate the local food treasures of our region. They publish a local food guide each year that is available at www.cvfoodfarmnetwork.org.

- **Community Food Security Vista Project** - Building community capacity to improve access to affordable fresh fruits and vegetables among vulnerable populations. Projects include garden projects, veggie home delivery program, Veggie Voucher program, and A Garden In Every Lot.

Environmental Health Initiatives
The Environmental Health programs at the University of Northern Iowa's Center for Energy & Environmental Education focus on the intersection of environmental sustainability and human health. There are two main initiatives of this CEEE program: Good Neighbor Iowa and Farming for Public Health. Good Neighbor Iowa focuses on eliminating unnecessary pesticide application in public spaces for child health, as well as but also to improving and maintaining urban pollinator habitat, biodiversity, and water quality. Farming for Public Health focuses on upstream, land-based solutions to a series of cascading environmental and human health issues that face the state of Iowa including water quality, flooding, soil and nutrient loss, rural economic vitality, biodiversity, pesticide application and drift, and food systems.

The Center partners with city governments, school districts, childcare centers, parks, nature centers, farm organizations, soil and water conservation districts, and many others and serves as a resource to all Iowans on these important environmental health topics.

Tall Prairie Center
The Tallgrass Prairie Center, a part of the University of Northern Iowa, works to establish diverse, resilient prairie and to increase

Resilience Today In Cedar Falls

Resilience Programs at UNI *continued*

appreciation of the tallgrass prairie ecosystem. Center programs support county roadside managers, farmers, landowners and native seed growers. The Tallgrass Prairie Center also offers prairie root banners and display specimens, a full range of resources for planning, planting and maintaining prairie; a spring Restoration and Management seminar series, and recorded webinars ("Botany Beginners") on how to identify native wildflowers, grasses and weeds

Resilience Today at Black Hawk County

Black Hawk County Extension - The Black Hawk County Extension and Outreach provides several programs to the community which support community resilience. There is a Master Conservationist Program which is designed to provide knowledge and skills to people who are interested in natural resource conservation. The Master Gardener Program which offers to individuals with training on topics such as lawn care, landscape and ornamental plantings, fruits and vegetables, insects and plant diseases, and plant nutrition, and more. Other programs to which provide education on food, healthy living, and nutrition.

Black Hawk County Soil and Water Conservation District (BHSWCD) - The Black Hawk County Soil and Water Conservation District is a governmental agency made up of locally elected officials and has been in place since 1946. BHSWCD works with private landowners and local governments to wisely use water resources and improve soil health. The BHSWCD oversees the Dry Run Creek Watershed Improvement Project which utilizes grant funding from various governmental agencies to provide financial assistance to install conservation and storm water management practices.

Black Hawk County Solid Waste Management Commission - The Commission sponsors two collection events each year. This is for household hazardous waste and electronics waste. The spring event is typically held in Waterloo and the fall event is held at the Cedar Falls Public Works building. On average, 900 vehicles that pass through each event. The Commission also works with Iowa Waste Exchange to assist businesses, organizations, schools, and others to find uses for materials that otherwise would end up in the landfill. The Commission also provides free education outreach to schools and organizations through their WasteTrac education team.

Planning Process

The Process

About the Planning Process

The process used to develop the resilience plan followed a stepwise approach. The stepwise approach is sequential, building forward step-by-step from what was learned or accomplished during the previous step or activity.

The planning process extended across eight months and included 12 online workshops, two Townhall Meetings, and four public worksheets. As workshops, surveys and worksheets were completed, information from previous ones were the basis for the questions and content of future engagement events. This approach allowed the planning team to systematically identify, explore and refine the issues important to the community of Cedar Falls.

The online engagement methods used in the plan's development exceeded expectations, nearly tripling community responsiveness compared to a conventional in-person approach. The process involved over 1,000 points of contact across the Cedar Falls community.

Survey and worksheets results for the overall project are considered to have a 5% to 10% margin of error based on normal industry practices and the numbers of responses to each workshop, survey or worksheet.

Anonymous spot checks of participant internet addresses strongly indicates that responses were local to Cedar Falls. (The spot checks never identify specific individuals or specific streets addresses, only general locations). A test for breadth of participation was conducted comparing similar national level survey results to local results. The similarity between results indicates balanced, broad participation by community members expressing a range of opinions.

The Planning Steps

Public Participation: September – March 2020
The first stage of the planning process began in September 2020 with a public two-part Public Survey. Six public workshops were conducted along with online self-guided workshops. The Workshops were organized around energy, the environment, water and flooding, the economy and jobs, diversity and equity, and community cohesion to gather community ideas. A Summary Townhall meeting was held to present and accept comments on the public survey and public workshop outcomes.

Development with Public Participation:
December 2020 - March 2021
The next stage of the process analyzed the information gathered from the surveys and workshops early in the process to assemble action items. The actions identified focused on items that can be accomplished locally by individuals, community organizations, businesses, the City of Cedar Falls and Cedar Fall Utilities. The intent of the actions is to make our community more resilient to forces that are unpredictable and many times are out of local control. The overarching goal is to ensure that the Cedar Falls community continues to offer a high quality of life to all members.

As part of Step 2, three Worksheets were published for public input in December 2020, January 2021, and in late March of 2021. Each of these worksheets refined the community's priorities and preferences for actions to help make the City and community more resilient. The two part Public Survey originally published in September and October was opened and publicized to ensure that it was available to all Cedar Falls residents who wanted to participate.

Finalization: April 2021 – October 2021
The final stage of the planning process involved synthesizing and organizing the plan into report form. The report was presented at an open house in 2022. Input from the open house was considered for inclusion in the final report.

The Process

Figure 1. Resilience Plan Public Participation & Engagement Schedule

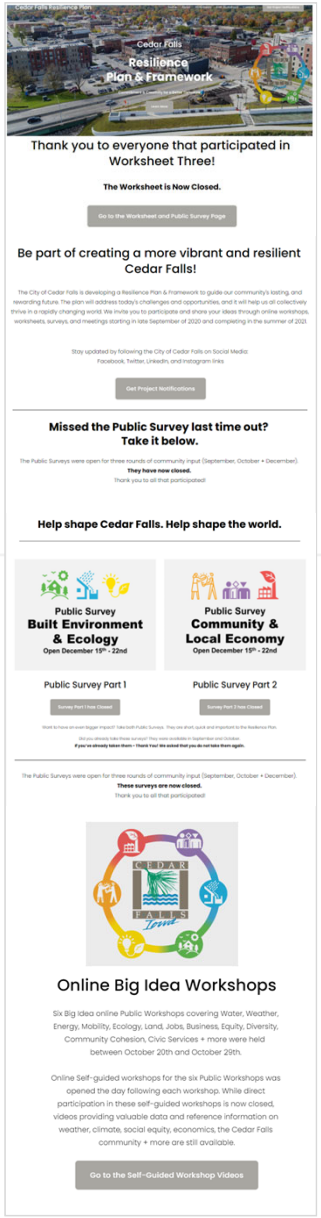
Public Participation	2020
September 22 thu October 03, 2020	Online public Survey Parts 1 and 2 – Round 1
October 20 thru October 30	Online public Survey Parts 1 and 2 - Round 2
Oct. 20th - Nov. 3rd	Big Idea Public Workshops and Self-Guided Workshops
October 20	Workshop: Ecology, Land and Habitat
	Online Self-Guided Workshop: Ecology, Land and Habitat
October 21	Workshop: Water, Weather and Urban Flooding
	Online Self-Guided Workshop: Water, Weather and Urban Flooding
October 22	Workshop: Energy, Mobility and Transportation
	Online Self-Guided Workshop: Energy, Mobility and Transportation
October 27	Workshop: Community Cohesion and Civic Services
	Online Self-Guided Workshop: Community Cohesion and Civic Services
October 28	Workshop: Equity, Diversity and Well-being
	Online Self-Guided Workshop: Equity, Diversity and Well-being
October 29	Workshop: Jobs, Business and Economy
	Online Self-Guided Workshop: Jobs, Business and Economy
November 03	Online Self-Guided Workshops Close
November 10	Workshops Summary Town Hall Meeting
December 15 thru 22	Online public Worksheet, Parts 1 and 2
December 15 Thru 22	Online public Survey Parts 1 and 2 - Round 3
Public Participation	2021
January 20 thru January 27, 2021	Online public Worksheet Two opens in mid-January 2021 - Complete
March 23 thru March 30, 2021	Online public Worksheet Three opened late March - Complete
April 12 2022	2022 Public Presentation
2022 Final Plan Completion	
Spring 2022	Resilience Plan Completion

The Process

Workshop One
Ecology, Land and Habitat
October 20,
Starts at 12:00 Noon
Runs Up to 90 Minutes in Length

Workshop Two
Water, Weather and Urban Flooding
October 21,
Starts at 12:00 Noon
Runs Up to 90 Minutes in Length

Workshop Three
Energy, Mobility and Waste
October 22,
Starts at 12:00 Noon
Runs Up to 90 Minutes in Length



Workshop Four
Community Cohesion and Civic Services
October 27,
Starts at 12:00 Noon
Runs Up to 90 Minutes in Length

Workshop Five
Equity, Diversity and Well-being
October 28,
Starts at 12:00 Noon
Runs Up to 90 Minutes in Length

Workshop Six
Jobs, Business and Economy
October 29,
Starts at 12:00 Noon
Runs Up to 90 Minutes in Length

Worksheet and Survey
Built Environment & Ecology
Open December 15th - 22nd

Worksheet Two
Built Environment
Community & Local Economy
Open January 20th – 27th

Worksheet Three
Economics and Community
Ecology and Weather
Energy, Mobility and Waste
Open March 23rd – March 30th

Using the Plan

A Flexible, Extended Timeline Framework Plan

The Cedar Falls Resilience Plan is a framework of actions that can improve the resilience and prosperity of the Cedar Falls community and its individuals, organizations and institutions.

The framework structure of the plan allows it to be flexible. It is written with an understanding that technology and the world are changing at a rapid pace, and the change will continue into the future. Much of the change occurring needs to be addressed sooner rather than later, but over time so it can be done cost effectively.

Plan Timeline and Cost Effectiveness
Those using this plan should note that it includes near-term, mid-term and long-term actions extending from 2022 through 2050 and beyond. The extended timeline is necessary because issues such as expanding the local economy, maintaining the business competitiveness of Cedar Falls and reducing carbon pollution must be pursued step by step. They include investments by private and public entities over time. Energy, water, sewer and transportation systems are examples of infrastructure that are planned with extended timelines of 30 to 50 years or more and have substantial impacts on business vitality and the well-being of a community.

The Actions Identified by the plan are projected to be cost effective and achievable within the general timelines identified. Consideration for any required, but anticipated innovation to existing technologies has been factored into the timelines.

The flexibility provided in the plan will allow the most effective technologies and approaches to be employed in a timely way that is efficient and feasible.

The Plan Structure

Planning Drivers are used to define the overarching topics, aspirations and influencing topics addressed by the plan. The Drivers are organized by three categories:

- **Local Economics & Community**
- **Weather & Nature**
- **Energy & Mobility**

Each plan category has a background narrative describing many of the key topics included in the category.

Action Sets
The category background narratives are followed by actions that can be pursued in support of the opportunities, issues and challenges represented by the narratives. Individual actions are organized into Action Sets. While individual actions will provide benefits and value to the community, executing an entire Action Set leverages the results of the other actions, offering the highest possible return value for investments of time, resources and / or money.

Co-benefits
Many Actions or Action Sets provide co-benefits supporting multiple opportunities, issues and challenges simultaneously. Some co-benefits may be indirect or not immediately visible. For example, action on energy efficiency can support fair and equitable opportunity for lower-income members of the community by freeing more of their earnings for better access to food or healthcare instead of spending it on basics such as heat.

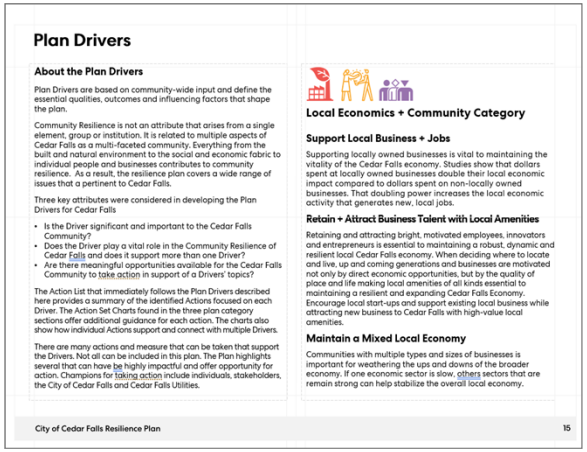
Plan users should note that not every topic or issue is explicitly outlined in the narrative, but a combination of the background narratives and Action Sets captures most key issues.

Using This Plan *continued*

Figure 2. below shows the key components of the Resilience Plan: (1) Resilience Plan Drivers which are the priority topics for the plan; (2) The Action List which is an abbreviated listing of items in the Action Plan; (3) Category Narratives describing topics and issues for each of the plans three categories; (4) The Action Plan which is the core of the Resilience Plan describing measures to be taken for improving the resilience of the Cedar Falls Community. Figure 3. on the following page provides a detailed description for each feature of the Action Set.

Figure 2. Resilience Plan Structure

(1) Plan Drivers



Plan Drivers

About the Plan Drivers

Plan Drivers are based on community-wide input and define the essential qualities, outcomes and influencing factors that shape the plan.

Community Resilience is not an attribute that arises from a single element, group or institution. It is related to multiple aspects of Cedar Falls as a multi-faceted community. Everything from the built and natural environment to the social and economic fabric to individual people and businesses contributes to community resilience. As a result, the resilience plan covers a wide range of issues that a pertinent to Cedar Falls.

Three key attributes were considered in developing the Plan Drivers for Cedar Falls

- Is the Driver significant and important to the Cedar Falls Community?
- Does the Driver play a vital role in the Community Resilience of Cedar Falls and does it support more than one Driver?
- Are there meaningful opportunities available for the Cedar Falls Community to take action in support of a Drivers' topics?

The Action List that immediately follows the Plan Drivers described here provides a summary of the identified Actions focused on each Driver. The Action Set Charts found in the three plan category sections offer additional guidance for each action. The charts also show how individual Actions support and connect with multiple Drivers.

There are many actions and measure that can be taken that support the Drivers. Not all can be included in this plan. The Plan highlights several that can have be highly impactful and offer opportunity for action. Champions for taking action include individuals, stakeholders, the City of Cedar Falls and Cedar Falls Utilities.

Local Economics + Community Category

Support Local Business + Jobs

Supporting locally owned businesses is vital to maintaining the vitality of the Cedar Falls economy. Studies show that dollars spent at locally owned businesses double their local economic impact compared to dollars spent on non-locally owned businesses. That doubling power increases the local economic activity that generates new, local jobs.

Retain + Attract Business Talent with Local Amenities

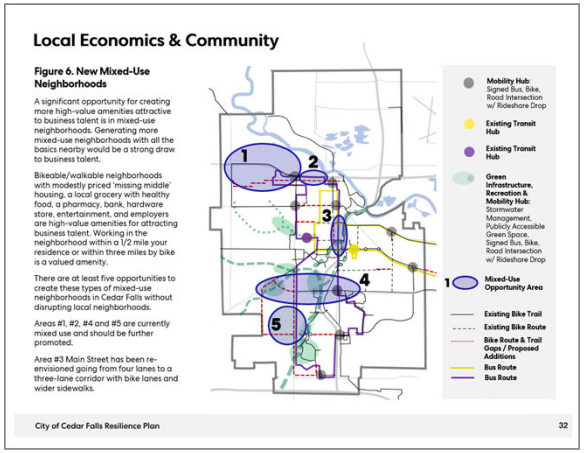
Retaining and attracting bright, motivated employees, innovators and entrepreneurs is essential to maintaining a robust, dynamic and resilient local Cedar Falls economy. When deciding where to locate and live, up and coming generations and businesses are motivated not only by direct economic opportunities, but by the quality of place and life making local amenities of all kinds essential to maintaining a resilient and expanding Cedar Falls Economy. Encourage local start-ups and support existing local business while attracting new business to Cedar Falls with high-value local amenities.

Maintain a Mixed Local Economy

Communities with multiple types and sizes of businesses is important for weathering the ups and downs of the broader economy. If one economic sector is slow, others sectors that are remain strong can help stabilize the overall local economy.

City of Cedar Falls Resilience Plan 15

(2) Category Narratives



Local Economics & Community

Figure 6. New Mixed-Use Neighborhoods

A significant opportunity for creating more high-value amenities attractive to business talent is in mixed-use neighborhoods. Generating more mixed-use neighborhoods with all the basics nearby would be a strong draw to business talent.

Bikeable/walkable neighborhoods with modestly priced 'missing middle' housing, a local grocery with healthy food, a pharmacy, bank, hardware store, entertainment, and employers are high-value amenities for attracting business talent. Working in the neighborhood within a 1/2 mile your residence or within three miles by bike is a valued amenity.

There are at least five opportunities to create these types of mixed-use neighborhoods in Cedar Falls without disrupting local neighborhoods.

Areas #1, #2, #4 and #5 are currently mixed use and should be further promoted.

Area #3 Main Street has been re-envisioned going from four lanes to a three-lane corridor with bike lanes and wider sidewalks.

1 2 3 4 5

Mobility Hub: Signed Bus, Bike, Road Intersection w/ Rideshare Drop

Existing Transit Hub

Existing Transit Hub

Green Infrastructure, Recreation & Mobility Hub: Stormwater Management, Publicly Accessible Green Space, Signed Bus, Bike, Road Intersection w/ Rideshare Drop

Mixed-Use Opportunity Area

Existing Bike Trail

Existing Bike Route

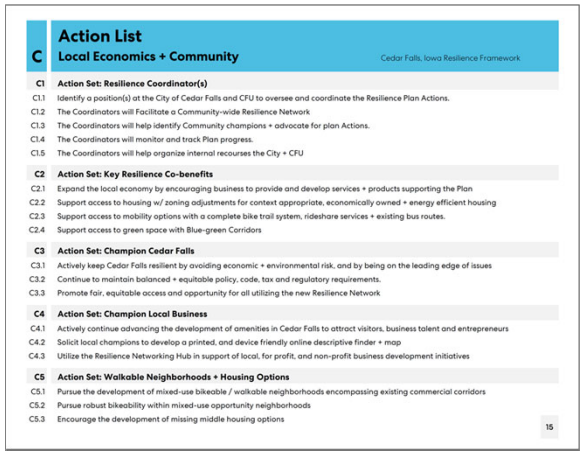
Bike Route & Trail Gaps / Proposed Additions

Bus Route

Bus Route

City of Cedar Falls Resilience Plan 32

(3) Action List



C Action List
Local Economics + Community
Cedar Falls, Iowa Resilience Framework

C1 Action Set: Resilience Coordinator(s)
C1.1 Identify a position(s) at the City of Cedar Falls and CFU to oversee and coordinate the Resilience Plan Actions.
C1.2 The Coordinators will Facilitate a Community-wide Resilience Network
C1.3 The Coordinators will help identify Community champions + advocate for plan Actions.
C1.4 The Coordinators will monitor and track Plan progress.
C1.5 The Coordinators will help organize internal recourses the City + CFU

C2 Action Set: Key Resilience Co-benefits
C2.1 Expand the local economy by encouraging business to provide and develop services + products supporting the Plan
C2.2 Support access to housing w/ zoning adjustments for context appropriate, economically owned + energy efficient housing
C2.3 Support access to mobility options with a complete bike trail system, rideshare services + existing bus routes.
C2.4 Support access to green space with Blue-green Corridors

C3 Action Set: Champion Cedar Falls
C3.1 Actively keep Cedar Falls resilient by avoiding economic + environmental risk, and by being on the leading edge of issues
C3.2 Continue to maintain balanced + equitable policy, code, tax and regulatory requirements.
C3.3 Promote fair, equitable access and opportunity for all utilizing the new Resilience Network

C4 Action Set: Champion Local Business
C4.1 Actively continue advancing the development of amenities in Cedar Falls to attract visitors, business talent and entrepreneurs
C4.2 Solicit local champions to develop a printed, and device friendly online descriptive finder + map
C4.3 Utilize the Resilience Networking Hub in support of local, for profit, and non-profit business development initiatives

C5 Action Set: Walkable Neighborhoods + Housing Options
C5.1 Pursue the development of mixed-use bikeable / walkable neighborhoods encompassing existing commercial corridors
C5.2 Pursue robust bikeability within mixed-use opportunity neighborhoods
C5.3 Encourage the development of missing middle housing options

15

(4) Action Plan

Cedar Falls, Iowa Resilience Plan

C5 Action Set
Walkable Neighborhoods & Housing Options

The first intent of this Action Set is to advance neighborhood development opportunities within Cedar Falls that offer amenities attractive to up and coming generations while avoiding significant disruption to existing neighborhoods. See Figure 6. The second intent is to advance housing options that fit the economic needs of all community members and stakeholders.

Local Economy & Community
Weather & Nature
Energy & Mobility
Champions, Partners, Logistics

C5 Actions
Plan Drivers & Co-benefits
Logistics

C5.1 Pursue the development of walkable & bikeable mixed-use neighborhoods that encompass existing commercial corridors with bus/bike access. Apply a missing middle housing approach. Update zoning requirements to be contextually appropriate. Encourage development in areas with small local grocers, banks, hardware stores, pharmacies, etc. within a 1/4 to 1/2 mile

C5.2 Provide the infrastructure supporting bikeability & walkability. Include shelters, bike racks & rideshare drops-offs at bus stops. Implement the Cedar Falls bike system & nurturing a locally owned rideshare co-op (include bike racks on all vehicles) will make mixed-use neighborhoods even more appealing for bike

C5.3 Encourage the development of missing middle housing options that can provide more modestly priced housing options appropriate for their location. Missing middle housing includes townhomes, cottage court, courtyard building, duplexes side-side & stacked, tri-plexes, fourplexes, multiplex & live-work designed to fit-in with the neighborhood & compliment it (not overtaken by unit counts & building size).

C5.4 Encourage distance and live/work housing with small first floor commercial uses through appropriate zoning and building codes by encouraging small co-working centers with small food service at higher-traffic street corners through out the community. At mixed-use areas allow for combined live/work housing, commercial maker and shop space, eateries and commerce. Encourage incubator flex space, artist lofts, micro-breweries and low-polluting micro-industry. Closely consider life safety, parking & vehicle access, facility size (not too large), streetscape conditions including vehicle and pedestrian interface, window to wall

C5.5 Encourage Accessory Dwelling Units (ADUs) where appropriate as means of providing diversified housing options, particularly for seniors needing assistance.

Potential Partners & Stakeholders
City/CFU, community, equipment suppliers & installers; developers; small developers, builders; building supply stores, nursery; financiers

Legend
Time: N Near-Term M Mid-Term L Long O On-going
Directly Focused this Plan Driver
Investment: $ Low $$ Med. $$$ High
Supports this Plan Driver
Value: M Med. H High HF Foundational NQ Not Quantifiable
Connects to this Plan Driver Topics
Champion
Support

Using This Plan *continued*

Figure 3. Action Set Chart

Action Sets bring together several, related individual plan actions as a grouping.

Action Sets do the following:

- Provide a description of specific actions.
- Identify basic logistics like the champions, benefit value and timeline for each action.
- Connect actions to Plan Drivers. A connection between a specific Plan Driver and actions is identified by a colored rectangle in the Plan Drivers & Co-Benefits chart. The level of intensity in which Drivers and actions connect is indicated by the color of the rectangle. Darker colors show higher levels of intensity and focus.
- See the graphic to the right for a description of each component of an Action Set chart.
- See page 19 for more detail on Timelines and Benefit Return Values / Paybacks.

Champions include Individuals , Community Stakeholders (Businesses, Organizations, Institutions), the City of Cedar Falls and Cedar Falls Utilities (CFU). Champions lead actions, and if funding is required, they would source the funding. Actions may be privately or publicly funded, or both.

Plan Drivers are based on community-wide input and define the essential qualities, outcomes and influencing factors that shape the plan.

The Co-benefits chart identifies which Plan Drivers an action is directed towards, and whether it is directly focused on a Driver, supports a Driver or meaningfully connects to a Driver.

Actions describe measures that address the Plan Drivers. The actions selected for the plan address multiple Drivers bringing the highest possible value and co-benefits to the greatest number of community members.

Time in Years:
Near-term = 1-5,
Mid-term = 5-15
Long-Term = 15-30+
Ongoing = Indefinite

Investment: Time (limited or no direct capital expenditure by the City of Cedar Falls), $ Low $$ Medium or $$$ High

Benefit Return Value and Payback:* M Medium, H High, HF Foundational for a prosperous future. NQ Not Effectively Quantifiable

*Establishing specific paybacks or investment dollars requires business plans and / or feasibility studies which are beyond the scope of this plan

Using This Plan *continued*

Figure 4. Action Set Chart

Benefit Return Value and Investment

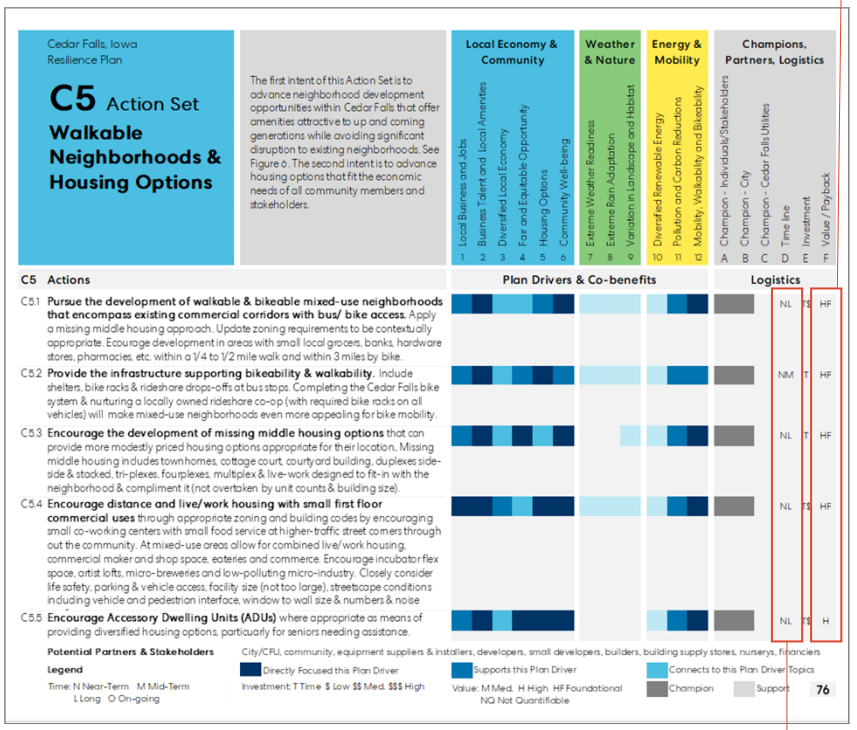
Not all benefits can be effectively measured in dollars and may be qualitative (non-measurable). For example, improved public safety, or quality of life benefits can be very difficult to quantify (with some exceptions). As a result, Benefit Return Value / Payback on an action is comprised of both monetary payback and qualitative value. Benefit Return Values are identified for individual actions as Low, Medium, High and High Foundational Value. Investment in actions are identified as Time, Low $, Medium $$ and $$$ High. Time is staff or community time committed to the project. $ are capital expenditures – either public, private or both.

- Low Value actions have a low-dollar return and they are low-performing. Low Value actions are intentionally not included in the plan.
- Medium and High Value actions were considered for inclusion in the plan with High value actions being given priority.
- High Value Foundational (HF) investments are basic for improving community resilience and can deliver a solid return for the resources invested. HF investments frequently involve extended periods of time and may require on-going private, public and non-profit investments of time, dollars and other resources.

The plan's overall Timeline extends for 30 years and beyond. As a result, activity levels for specific actions may vary over time. The Timeline indicates activity level variation by combining different Timeline indicators. See the note on the bottom left of this figure.

Action C5.4 "Encourage distance and live/work housing" can be used as an example. Action C5.4 will require staff time, and it may require some consulting expenses to assist with zoning and building code updates. It has a Time and Low $ investment indicator (T$); a Near-term / Long-term (NL) Timeline indicator and a High Foundational (HF) Benefit Return Value and Payback indicator.

Benefit Return Value and Payback provides an indicator of both monetary payback and qualitative value. See the Benefit Return Value and Investment description to the left for more details.



The Timeline indicates activity variations over time for specific actions by combining different time-lines. Examples:

- Near-term / Long-Term (NL) indicates early, focused activity with expected strong activity maintained overtime.
- "Near-term / On-going (NO) indicates focused activity early that may dial down, but does not cease over time.
- "Near-Term / Mid-Term indicates early focused activity with expected strong activity maintained for 5-15 years.

Plan Overview

Plan Overview

Resilience Overview

Cedar Falls has an abundance of resources and opportunities with a wealth of active and engaged citizens and organizations. This Resilience Plan recognizes the richness of that existing talent and works toward sewing a fabric of connections across topics important to the broader community of Cedar Falls. The plan is a community resource for individuals, community stakeholders, and the City of Cedar Falls. One goal of the plan is to allow the citizens, businesses, organizations, and institutions of Cedar Falls to see how their interests, goals, and aspirations can align, interconnect, and work together to create a more resilient present and future for Cedar Falls as a community.

Resilience is a broad topic that is larger than any one individual, business, or institution. It arises through the daily actions taken by all community members contributing in ways that best fit their knowledge, talent, and interests. In response, the plan identifies resiliency actions that can be taken or championed by individuals, community stakeholders, the City of Cedar Falls, and Cedar Falls Utilities (CFU).

Resilient communities have the capacity to resist and rebound from economic, social and physical disruptions. They are healthy, adaptable, and regenerative through a combination of redundancy and variation in resources, people, and perspectives. They have the foresight and the capacity to act on that foresight *together*. Yet they maintain a measure of self-reliance and independence among individuals and organizations. They can learn and evolve based on changing conditions, both individually and collectively as a community.

Resilient communities have four basic dimensions as outlined by the Rockefeller Foundation's 100 Resilient Cities program:

- Economy & Society
- Infrastructure & Environment
- Health & Wellbeing
- Leadership & Strategy

Resilience Plan Purpose & Approach

The purpose of the Cedar Falls Resilience Plan is to empower the community to maintain and improve quality of life, build prosperity and enhance community resilience. The plan is comprehensive, robust, knowledge driven, and innovative.

The plan is developed as a framework containing over 45 actions and goals that are accompanied by supporting narratives and graphics that expand on opportunities for implementing the actions. Here are three examples of actions and goals included in the resilience plan:

- Support local businesses and jobs
- Achieve communitywide Net Zero Carbon pollution by 2050 for electricity and natural gas
- Adapt to extreme rain events

The planning process extended across eight months and included 12 online workshops, two Townhall Meetings, and four public worksheets.

The information, ideas, and opinions gathered directly influenced the development of the actions and recommendations included in the plan. While participants may not directly see their suggestions or ideas written in the plan, every comment was considered and influenced the planning action strategies.

Several key issues, topics, and ideas emerged during the community engagement process. Issues were identified and prioritized (see Figure 5. on the next page). This Community input was vital to shaping the Plan Drivers and the Plan Action Sets. Plan Drivers organized into three categories creating the plan's essential framework for Resilience

Plan Drivers are described in detail starting on page 19.

Plan Overview *continued*

Priority Issues

Throughout the planning process, the community was asked to identify issues, topics, and ideas to include in the plan. Community input, along with other information, was used to help identify the actions and drivers in this plan. The chart offers community rated topics based on data from multiple surveys and worksheets.

Actions and recommendations included in the plan were identified and developed that are specifically appropriate to the opportunities and risks for Cedar Falls as both a city and a community. While each action my not be novel to Cedar Falls, the Action Sets and recommendations are collectively unique to Cedar Falls, and they have been adapted in specific ways that respond to the needs of Cedar Falls.

The final plan has a strong focus on local economics and jobs. Actions included in all three of the plans major categories improve the competitiveness of Cedar Falls as an attractive community to live, work, and thrive, now and in the future.

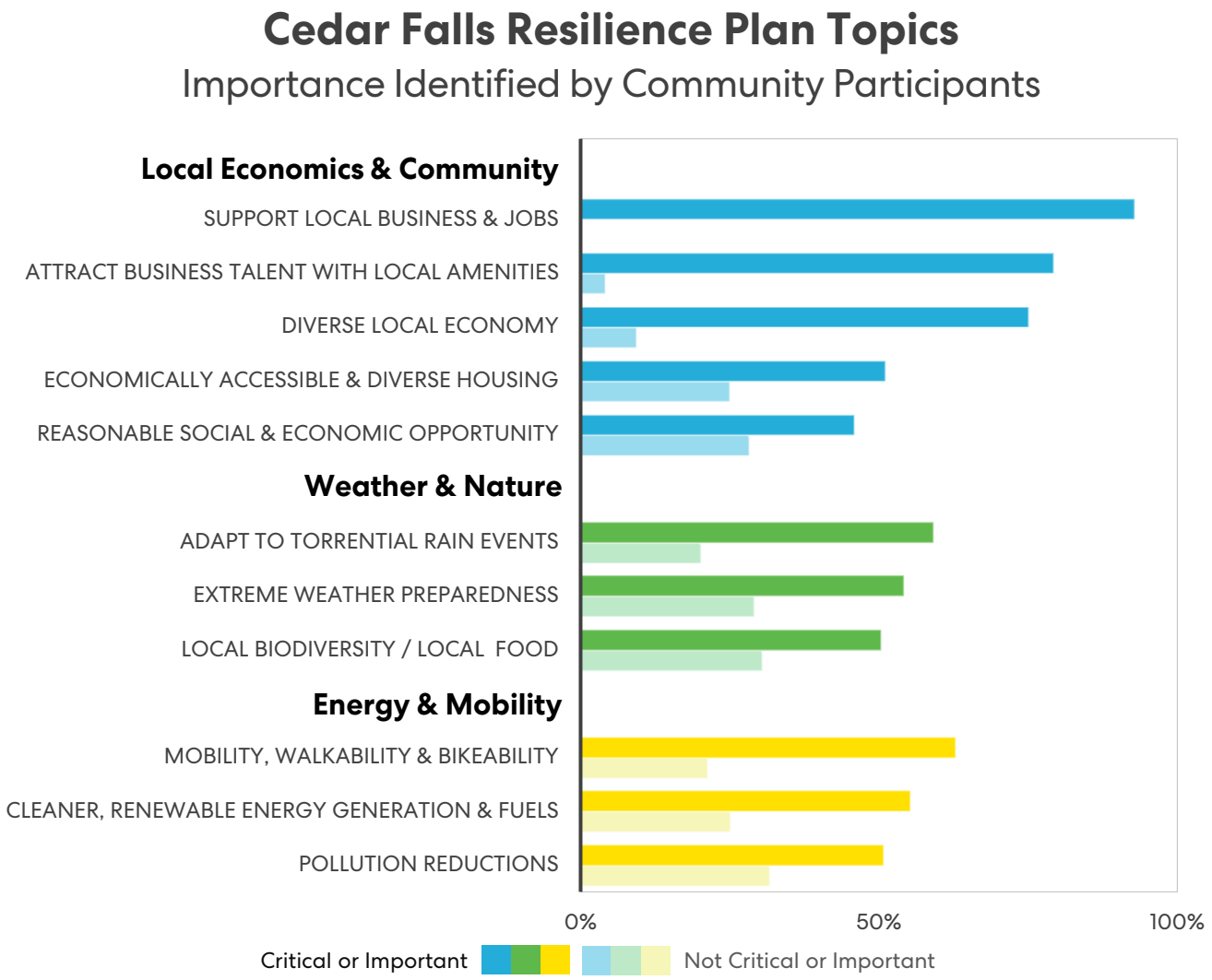


Figure 5. Priority Issues

Plan Drivers

About the Plan Drivers

Plan Drivers are based on community-wide input and define the essential qualities, outcomes and influencing factors that shape the plan.

Community resilience is not an attribute that arises from a single element, group or institution. It is related to multiple aspects of Cedar Falls as a community. Everything, from the built and natural environment, to the social and economic fabric, to individual people and businesses, contributes to community resilience. As a result, the Resilience Plan covers a wide range of issues that are pertinent to Cedar Falls.

Three key attributes were considered in developing the Plan Drivers for Cedar Falls:

- Is the Driver significant and important to the Community?
- Does the Driver play a vital role in community resilience, and does it support more than one Driver?
- Are there meaningful opportunities available for the community to take action in support of a Drivers' topics?

The Action List that immediately follows the Plan Drivers described here provides a summary of the identified Actions focused on each Driver. The Action Set charts found in the three Resilience Plan category sections offer additional guidance for each action. The charts also show how individual Actions support and connect with multiple Drivers.

Many actions and measures that can be taken to support the Drivers. Not all can be included in this Plan. The Plan highlights several Drivers that can be highly impactful and offer opportunity for action. Champions for taking action include individuals, stakeholders, the City of Cedar Falls and Cedar Falls Utilities.

Local Economics & Community Category

Support Local Business & Jobs

Supporting locally owned businesses is essential to maintaining the vitality of the Cedar Falls economy. Studies show that dollars spent at locally owned businesses double their local economic impact compared to dollars spent on non-locally owned businesses. That doubling power increases the local economic activity that generates new, local jobs.

Retain & Attract Business Talent with Local Amenities

Retaining and attracting bright, motivated employees, innovators and entrepreneurs is essential to maintaining a robust, dynamic and resilient local Cedar Falls economy. When deciding where to locate and live, up and coming generations and businesses are motivated not only by direct economic opportunities, but also by the quality of place and life making local amenities of all kinds essential to maintaining a resilient and expanding Cedar Falls economy. The community should encourage local start-ups and support existing local businesses while attracting new business to Cedar Falls with high-value local amenities.

Maintain a Diversified Local Economy

Encouraging multiple business types, sizes and owners is an important strategy for stabilizing local economies and communities. The strategy works like this: If a set of business types is slow due to economic change, other types may remain busy, helping to stabilize the local economy and improve its overall resilience.

Local Economics & Community

Figure 6.
Plan Categories and Drivers

The Plan is organized around three primary categories: Local Economics & Community, Weather & Nature and Energy & Mobility.

The categories are focused on issues and actions addressing the Plan Drivers. Plan Drivers are derived from community-wide input and define the essential qualities, outcomes and influencing factors that shape the plan.

Local Economics & Community

Plan Drivers
Support Local Business & Jobs
Retain & Attract Business Talent with Local Amenities
Maintain a Diversified Local Economy
Provide Fair & Equitable Opportunity
Develop Housing Options
Maintain and improve Community Well-being

Weather & Nature

Plan Drivers
Pursue Extreme Weather Readiness
Pursue Extreme Rain Adaptation
Improve Variation in Landscape Plantings & Habitat

Energy & Mobility

Plan Drivers
Pursue Diversified Renewable Energy
Pursue Pollution and Carbon Reductions
Improve Mobility, Walkability & Bikeability

Plan Drivers *continued*

Provide Fair & Equitable Opportunity

Local economies are stronger when everyone in the community has purchasing power, access to opportunity and personal wellness. Ensuring that everyone in the Cedar Falls community has fair, equitable access to quality wages, jobs and amenities will help maintain a vibrant, resilient local economy.

Develop Housing Options

Maintaining a resilient local economy requires having housing options for people with a wide array of occupations and differing economic means and needs. Housing options also need to provide for various family sizes, differing generational needs and personal preferences.

Maintain and Improve Community Well-being

The Cedar Falls community will be its most resilient when individuals and the community are physically and mentally healthy, stable and vibrant. Factors important to well-being include fair and equitable access to opportunity, healthy food, clean air and a clean environment with access to nature and physical activity.

Weather & Nature

Pursue Extreme Weather Readiness

The weather in Cedar Falls and the region is changing and is expected to continue changing with increasingly extreme weather becoming a new normal. Issues of note include increased wind strength, heat, ice, hail and rain. Along with the information in this plan, the Black Hawk County Multi-jurisdictional Hazard Mitigation Plan is a valuable reference.

Pursue Extreme Rain Adaptation

Torrential rain events have been measurably increasing in strength and frequency for the past 60 years. These events are creating a risk of localized urban flash flooding (not major flooding from the Cedar River). The community-wide existing stormwater infrastructure will need to be incrementally adapted and new infrastructure will need to be right-sized for the new conditions.

Improve Variation in Landscape Plantings & Habitat

The slow, continued loss of variation in local plants and wildlife is weakening the resilience of local and regional natural systems. Natural systems provide important, cost-effective services that can be taken for granted like filtering pollutants from surface and ground water, pollinating plants, and providing natural beauty to Cedar Falls. Native and adapted plantings are better suited to the local weather, and they are inherently more resistant to local diseases and insects

Energy & Mobility

Pursue Diversified Renewable Energy & Conservation

Energy security and pollution reductions require expanding the use of wind and solar based energy. These energy resources are now some of the most cost-effective energy sources available, and they can be highly effective when properly engineered.

Pursue Lower-Polluting, Carbon Neutral Energy

Pollution degrades human health and quality of life. Effectively managing energy sources and resources can dramatically reduce pollution and it's impacts on people and nature.

Improve Mobility, Walkability & Bikeability

Alternative mobility, walking and biking improves individual and community wide wellness and fair access to transportation. They are valued amenities for up-and-coming generations of business talent.

Action List

C Local Economics & Community

C1	**Action Set: Resilience Coordinators**
C1.1	Identify existing positions at both the City of Cedar Falls & Cedar Falls Utilities to oversee and coordinate the Plan Actions
C1.2	The coordinators will facilitate a community-wide Resilience Network
C1.3	The coordinators will help identify community champions & advocate for Resilience Plan actions
C1.4	The coordinators will monitor and track Resilience Plan progress
C1.5	The coordinators will help organize internal resourses of the City and Cedar Falls Utilities for facilitating the Resilience Plan
C2	**Action Set: Key Resilience Co-benefits**
C2.1	Expand the local economy by encouraging businesses to provide and develop services and products supporting the Plan
C2.2	Support access to housing with zoning changes for context appropriate, economically diversified & energy efficient housing
C2.3	Support mobility options by implementing the Bike-Pedstrian Plan complemented by rideshare services & existing bus routes.
C2.4	Support access to green space with Blue-green Corridors following water ways and natural areas
C3	**Action Set: Champion Cedar Falls**
C3.1	Actively keep Cedar Falls resilient by avoiding economic and environmental risk
C3.2	Continue to maintain balanced & equitable policy, code, tax and regulatory requirements
C3.3	Utilize the new Resilience Network to help promote fair, equitable access and opportunity for all members of the community
C4	**Action Set: Champion Local Business**
C4.1	Actively continue advancing the development of amenities in Cedar Falls to attract visitors, business talent and entrepreneurs
C4.2	Solicit local champions to develop a printed, and device friendly online descriptive finder & map
C4.3	Utilize the Resilience Networking in support of local, for profit and non-profit, business development initiatives and start-ups
C5	**Action Set: Walkable Neighborhoods & Housing Options**
C5.1	Develop mixed-use bikeable / walkable neighborhoods encompassing existing commercial corridors
C5.2	Pursue robust bikeability within mixed-use opportunity neighborhoods
C5.3	Encourage the development of missing middle housing options
C5.4	Encourage distance and live/work housing with small first floor commercial uses
C5.5	Encourage Accessory Dwelling Units (ADUs)

Action List

W Weather & Nature

W1	**Action Set: Extreme Weather Readiness**
W1.1	Plan for increasingly extreme wind events from derechos, thunderstorms and tornadoes
W1.2	Plan for increasingly extreme rainfall events that bring extended torrential rains
W1.3	Plan for warming temperatures as indicated by shifting Hardiness Zones and weather data
W1.4	Explore emergency back-up energy for essential facilities and services
W2	**Action Set: Blue-Green Natural Corridors: Co-Benefits**
W2.1	Enhance the co-benefits of the city's waterway and green space network
W2.2	Create Blue-green corridor hubs co-locating stormwater management and outdoor recreation & mobility options
W2.3	Link corridors for natural vitality and rainwater management and biking
W2.4	Incrementally add pollinator and bird friendly native & adapted plantings and trees
W3	**Action Set: Blue-Green Natural Corridors: Co-Benefits**
W3.1	Increase the existing stormwater system capacity to manage new development & increasing extreme rainfall volumes
W3.2	Economically manage stormwater using a combination of site and district level approaches across Cedar Falls
W3.3	Incrementally increase available green space and stormwater capacity in already developed areas
W3.4	Reduce barriers to regional stormwater management
W4	**Action Set: Extreme Rainfall Management**
W4.1	During Capital Improvement Planning, perform an urban flash flooding risk screen
W4.2	Proactively improve extreme rainfall readiness
W4.3	Manage extreme rain stormwater flows upstream from already developed neighborhoods
W5	**Action Set: Beneficial Yardscapes + Landscapes**
W5.1	Use a variety of native & adapted plantings and trees for residential and commercial yards and public landscapes
W5.2	Increase pollinator and bird habitat using native and adapted plantings
W5.3	Plan for a an ongoing shift in the Hardiness Growing Zone
W5.4	Encourage rainwater harvesting for irrigation and habitat areas
W5.5	Reduce the use of pesticides and herbicides by growing native & adapted plants

Action List

E Energy & Mobility

E1	**Action Set: Residential Energy Efficiency**
E1.1	Voluntary energy use reduction programs for existing and new homes
E1.2	Continue voluntary energy audits
E1.3	Explore energy efficiency loan and community grant programs for Cedar Falls residents
E1.4	Coordinate energy efficiency programs with neighborhood revitalization efforts and community development block grants
E1.5	Continue with Cedar Falls Utilities efficiency programs
E2	**Action Set: Commercial & Industrial Energy Efficiency**
E2.1	Voluntary energy use reduction for existing and new commercial and industrial buildings
E2.2	Execute energy efficiency actions for existing city and public facilities
E2.3	Continue voluntary commercial building energy audits and energy modeling
E2.4	Continue voluntary energy audits for industrial facilities
E2.5	Support on-site renewable energy on existing and new public and private facilities
E2.6	Continue support for the installation and connection of renewable generation systems to CFU's electric grid
E3	**Action Set: Lower-Polluting Carbon Neutral Energy & Conservation**
E3.1	Community-wide pollution and carbon reductions from electricity use - carbon neutral by 2050
E3.2	Support customer owned renewable resources
E3.3	Evaluate increased market energy purchases to take advantage of Iowa's growing renewable resources
E3.4	Evaluate low-emission, renewable generation supply and transmission options both locally and regionally
E3.5	Continue to invest in the resiliency of Cedar Falls Utilities owned infrastructure

Action List

E Energy & Mobility *continued*

E4	**Action Set: Lower-Polluting Carbon Neutral Heating Energy**
E4.1	Community-wide pollution and carbon reductions from Cedar Falls Utilities provided electricity and natural gas
E4.2	Pursue alternative natural gas options
E5	**Action Set: Lower Polluting, Mobility Options**
E5.1	Incrementally convert City and Cedar Falls Utilities fleet to hybrid electric or electric vehicles
E5.2	Promote voluntary use of hybrid electric and electric vehicles in the community (EV's)
E5.3	Continue to support an EV charging station program
E5.4	Continue to support electrification/low emission alternatives to ICE (Internal Combustion Engines)
E5.5	Explore development of a local rideshare co-op or private program
E5.6	Complete the bike trail and commuter routes in Cedar Falls - refer to the Bike-Pedestrian Plan
E6	**Action Set: Landfill Waste Reduction and Diversion**
E6.1	Pursue incremental advancement towards Zero Waste by 2070
E6.2	Encourage economic development of the local circular economy
E6.3	Explore a voluntary curbside composting co-op operated by local farmer
E6.4	Encourage a Consumer Campaign promoting voluntary plastic waste and waste use-reductions

Local Economics & Community

Local Economics & Community

Expanding the Local Economy & Jobs

Community participants in the resilience plan development collectively agreed on three top resilience issues:

- Supporting local business and jobs
- Attracting business talent with local amenities
- A diverse economy

These three issues create an interconnected system where it is hard to have any of them without all three. Cedar Falls is a prosperous community with a robust set of amenities that any city in America would be fortunate to have: a vibrant downtown, the arts and culture associated with University of Northern Iowa (UNI), fast broadband, a robust bike trails system, an eye towards environmental stewardship, access to nature, modest cost housing, a bikeable city, walkable neighborhoods, and an entrepreneurial spirit.

Cedar Falls has a lot of great amenities in place. However, the competition for new business talent, aspiring entrepreneurs, and innovators is steep. Maintaining a vibrant, amenities-rich, diversified local economy with good jobs requires constant investment.

In today's economic environment, most businesses are looking for more than a low-cost place to conduct their activities. They need a location that is itself prosperous and stable, and they are looking for a competent workforce. In short, they need a location that can attract the talent and employees that will make their business a success.

They are also looking for communities that can effectively balance the needs of the community at large so that it is a vibrant and lush place to live while meeting the needs of its individual businesses and individuals. Cedar Falls has a long and successful history of doing that, and it should continue to pursue that legacy.

Expanding Cedar Falls Amenities

Aside from offering the typical tax subsidies and promoting local businesses, a critical action that Cedar Falls can take to drive its local economy forward and attract business talent is to offer the kinds of amenities that companies and business talent are pursuing.

The fact that Cedar Falls already has a lot to offer means it has the potential to provide even more. In other words, Cedar Falls has the potential to be even more competitive in the region and nationally than it is today. This can be done while maintaining a desirable City for the current residents of Cedar Falls, and while creating local jobs and business in pursuit of attracting even more.

The amenities offered by the Cedar Falls community establish a robust platform and a rich set of opportunities for building forward into the future. They are all amenities important to the up-and-coming generations of business talent being pursued. While Downtown, UNI, and fast broadband are all being tended to, there are opportunities available that could be leveraged.

For example, local wind power, access to biomass, and local control of municipal utilities have Cedar Falls poised to be a national leader in low-carbon renewable energy. Clean energy can be a solid signal to up-and-coming business talent who take pollution and environmental issues very seriously as a group. The rich agricultural lands and availability of water are resources that will be of very high value as the weather across North America increasingly becomes hotter, dryer, and more extreme on the coasts making Cedar Falls a great place to locate.

Local Economics & Community

Figure 7. New Mixed-Use Neighborhoods

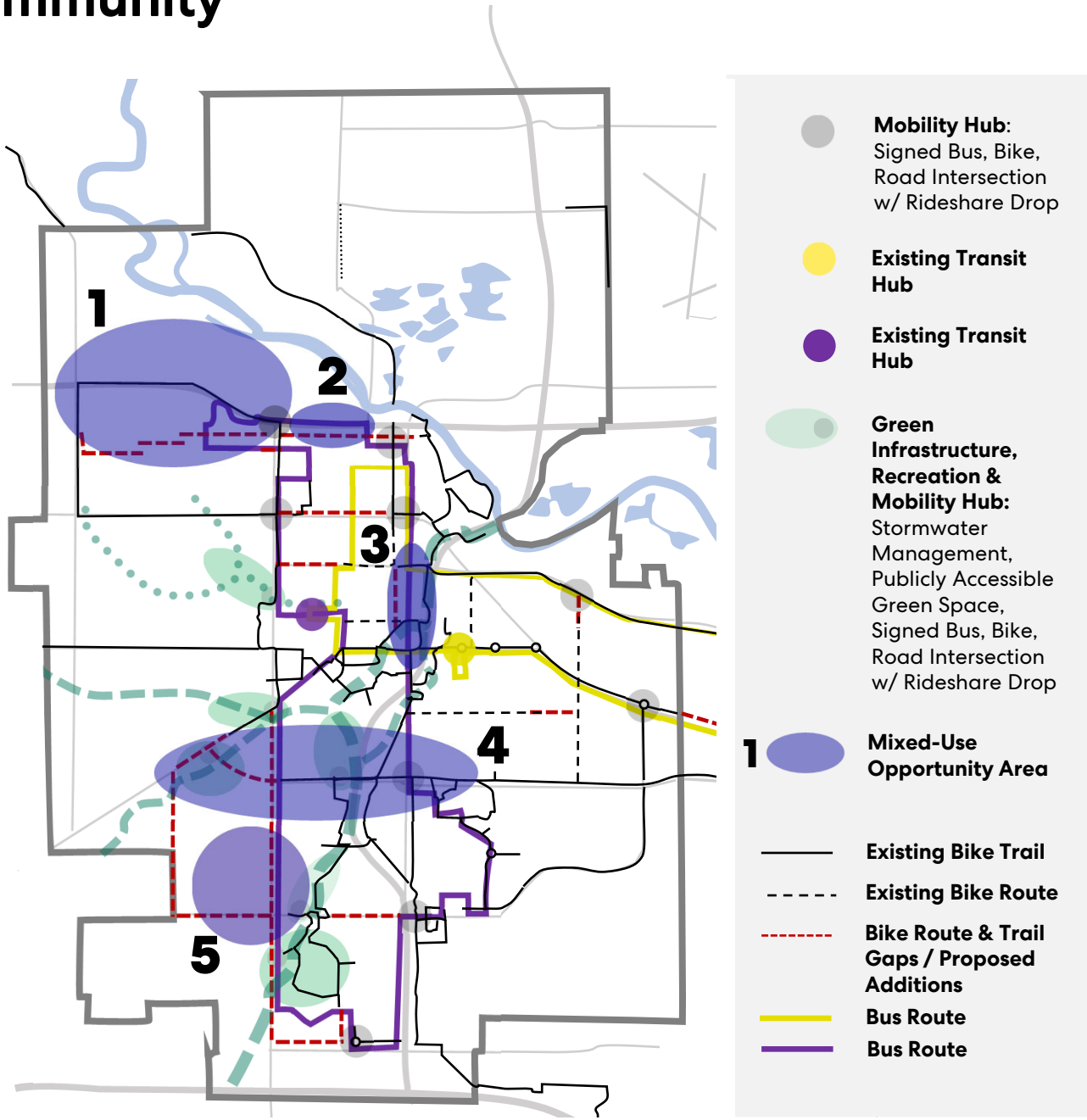
A significant opportunity for creating more high-value amenities attractive to business talent is in mixed-use neighborhoods. Generating more mixed-use neighborhoods with all the basics nearby would be a strong draw to business talent.

Bikeable/walkable neighborhoods with modestly priced 'missing middle' housing, a local grocery with healthy food, a pharmacy, bank, hardware store, entertainment, and employers are high-value amenities for attracting business talent. Working in the neighborhood within a 1/2 mile of your residence or within three miles by bike is a valued amenity.

There are at least five opportunities to create these types of mixed-use neighborhoods in Cedar Falls without disrupting local neighborhoods.

Areas #1, #2, #4 and #5 are currently mixed use and should be further promoted.

Area #3 Main Street has been re-envisioned going from four lanes to a three-lane corridor with bike lanes and wider sidewalks.



Local Economics & Community

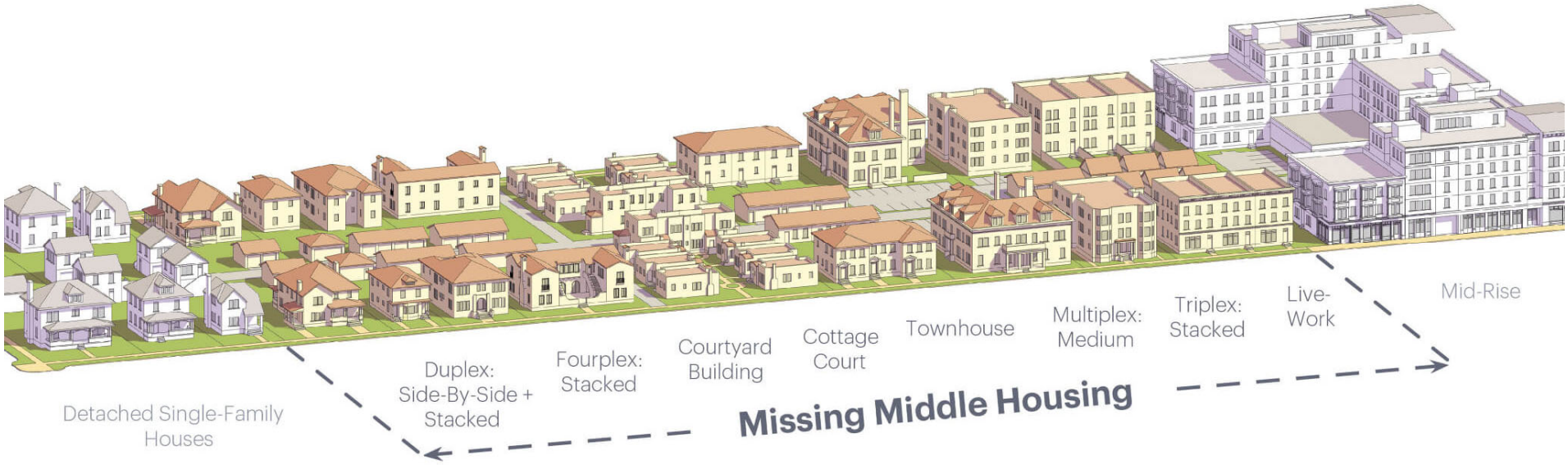


Figure 8. Missing Middle Housing

The term "Missing Middle Housing," is a transformative concept that highlights a time-proven and time-honored way to provide housing and more housing choices in resilient, walkable places.

Missing Middle Housing: House-scale buildings with multiple units in bikeable walkable neighborhoods

These building types, such as duplexes, fourplexes, cottage courts, and courtyard buildings, provide diverse housing options and support locally-serving retail and mobility options. They are called "Missing" because they have typically not been built due to zoning laws since the mid-1940s and these are called "Middle" because they sit in the middle of a spectrum between detached single-family homes and mid to high-rise apartment buildings in terms of form, scale, number of units, and often, cost. In the diagram above, the Missing Middle types are shown in yellow showing many housing options in between the single-family homes and higher intensity apartment buildings shown in white.

Adapted from Opticos Design founder Daniel Parolek.

Local Economics & Community

Figure 9. Blue-green Corridors

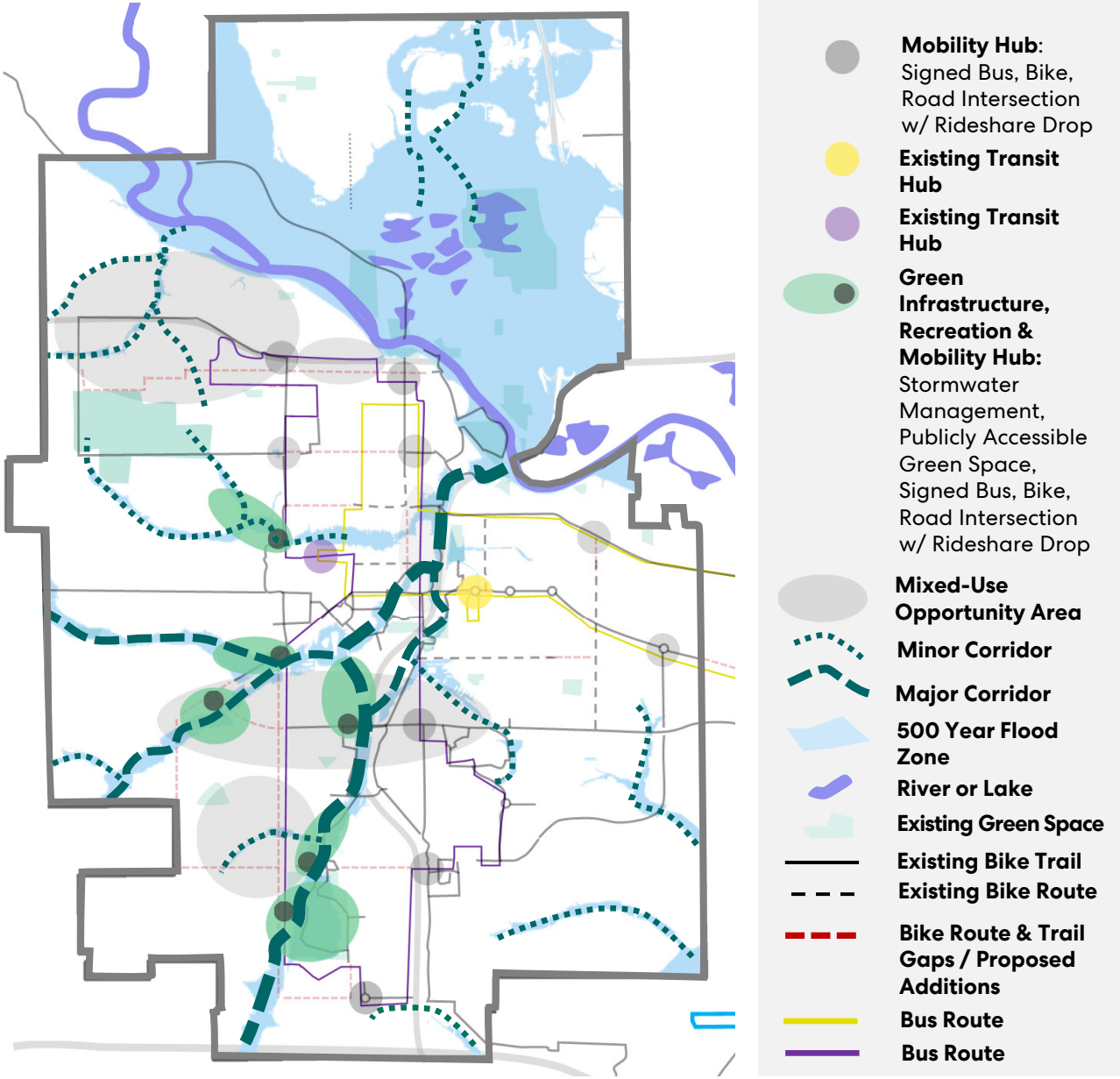
For the purpose of this plan, a Blue-green Corridor is defined as "privately or publicly owned corridors of open space which often follow natural land or water features which are primarily managed to protect and enhance natural resources, provide recreation and mobility."

Refer to the City of Cedar Falls Environmentally Sensitive Lands Survey and Comprehensive Plan for additional recommendations on greenway Corridors and natural areas.

The bikeable/ walkable mixed-use neighborhoods with modestly priced housing and essential amenities close at hand can be made genuinely robust with Blue-green Corridors that offer quick and easy access to nature, recreational biking, and relaxation. The Corridors can support Cedar Fall's Bird Friendly designation, the 9th in the state.

It is becoming evident that extreme weather events are a new norm and will most likely become even worse in the future. Safety from the ravages of extreme weather will be increasingly critical.

Blue-green Corridors provide an opportunity to effectively manage extreme rain and localized flash flooding by expanding the use of green-infrastructure while providing habitat for birds, endangered pollinators, access to nature, and recreation. Managing the extreme rain events where Cedar Falls is at



Local Economics & Community

Figure 10:
Center Street Corridor Improvement Project

The Center Street Corridor Improvement Project, as describe in the flyer on the left, is a project that incorporates elements of a blue-green corridor to increase the vibrancy of Center Street as a corridor for the North Cedar Neighborhood and the community.

Blue-green corridors integrate the infrastructure needs of a community within a more natural environment. Blue-green corridors provide infrastructure supporting all modes of transportation; pedestrian, biking, and automobiles. Blue-green corridors support plant, bird, and insect populations while managing the runoff from paved surfaces. In addition, the use of Blue-green infrastructure can be a cost effective solution for managing storm water by eliminating some or all of the underground sewer network. Blue-green infrastructure has maintenance costs, but the maintenance is typically less than the cost associated with gray infrastructure.

The Center Street Corridor Improvement Project is occurring in two phases. A multi-use trail along the west side of Center Street from Cottage Row Road north to Lone Tree Road was completed in 2019. It completed a loop connecting the neighborhood to Downtown and Black Hawk Park. The second phase is slated for 2022 adding bioswales and amenities. Curbs will be added from Thomas Street south to Western Avenue. Sidewalks will be added, where missing, along the east side of Center Street in that area that continues connecting the surrounding neighborhood to the trail, which will improve pedestrian connectivity to the trail.

The project will incorporate trees and native plants in a roadside swale to provide a natural system to manage, filter, and absorb some of the run-off from Center Street. The project will also improve the aesthetics of the street corridor by adding trees and plants to the streetscape.

Local Economics & Community

Blue-Green Corridors *Continued*

risk of localized flash flooding is important for public safety and economic prosperity. Business talent and owners seek stability, along with opportunity when shopping for their hometown. See the Weather & Nature category for more information on Blue-green Corridors and flash flooding risks.

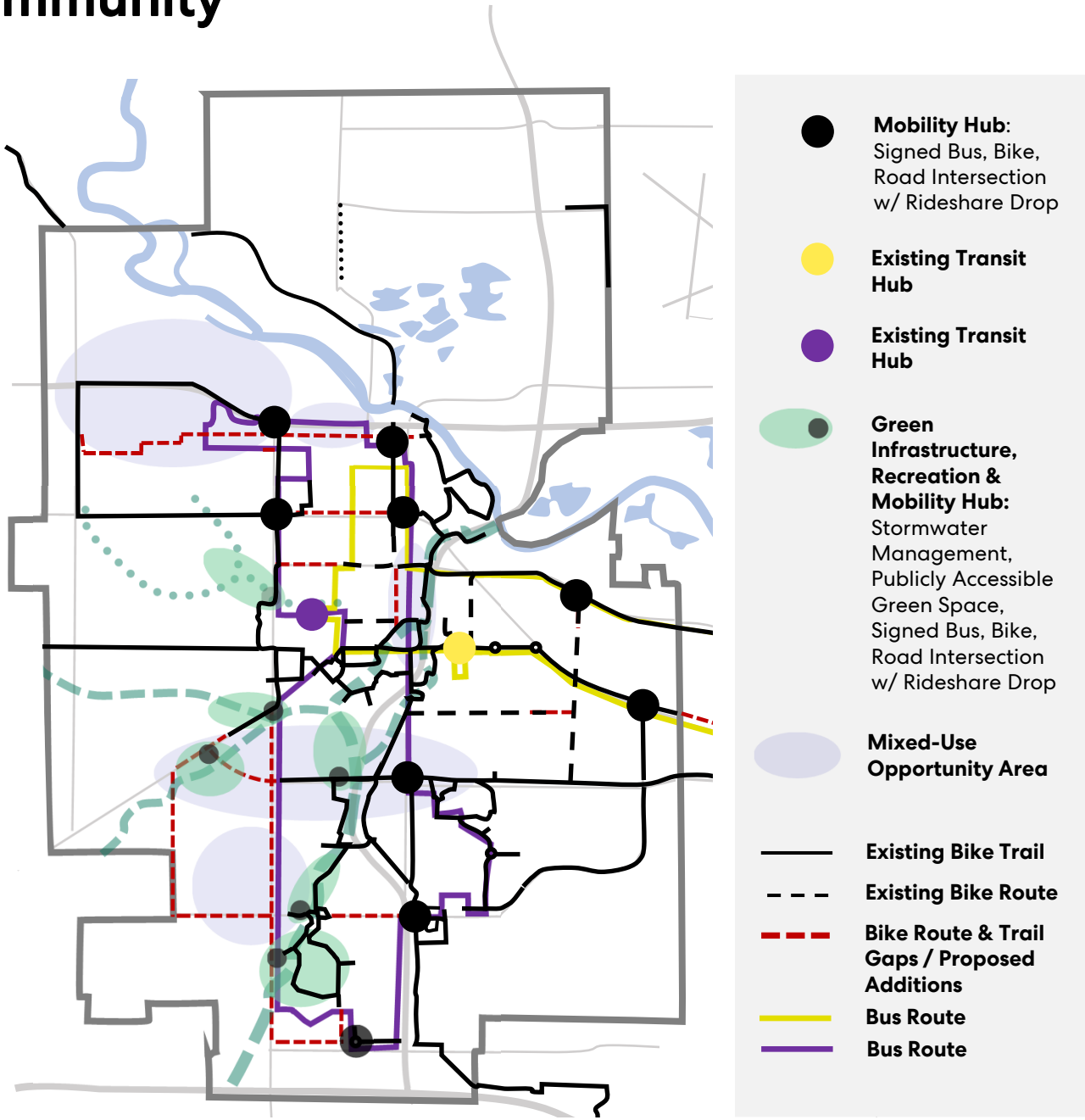
Figure 11. Bikeable/Walkable Communities

Bikeable, walkable communities are high-value amenities for attracting up and coming business talent. Walkability and bikeability also ranked high on the list of requests during the resilience planning process, coming in 4th on the list of plan priorities, just after a diversified economy.

Bikeable, walkable amenities go beyond sidewalks to include safety, comfort and aesthetic features such as:

- Painted crosswalks, bike lanes and bike racks.
- Reduced vehicle speed.
- Traffic calming using narrower streets or intersections.
- Trees for aesthetics and shade.
- Multiple businesses and services that are closely spaced, connected with sidewalks, and located near individual neighborhoods.

The existing bike trail system and the Bike Pedestrian Plan can create the backbone of a more robust and reliable mobility option for



Local Economics & Community

commuting much of the year. The system would include major elements such as:

- A complete commuter bike route and trail system eliminating dead ends or gaps.
- A privately owned hybrid vehicle rideshare system/co-op with commuter bike racks
- The existing bus routes with bike carriers

Resilient Technologies and Local Economics

Everything in the plan can contribute directly to local jobs and the local economy. All of the actions are good for business and the local economy. For example, wind turbine mechanic is the fastest-growing job in the U.S. Solar power installer is not far behind. Making the Cedar Falls electric grid a state of the art, resilient, and carbon neutral power grid can provide quality, local jobs and increased skills that can be exported around the region. This can be an innovation engine and magnet for resilient technology start-ups. Renewable energy and micro-grids are discussed further in the Energy & Mobility Category.

Renewable electricity is now the cheapest way to generate electricity. By expanding the use of renewable energy, Cedar Falls Utilities can continue to offer low-cost energy for residents and commercial customers. This is particularly important for attracting electricity-intensive industries. Unlike fossil fuels in Iowa, renewable electricity can be locally generated and the equipment can be locally maintained by people in Cedar Falls and the region. Renewable energy jobs frequently offer a living/family-wage.

Green infrastructure for managing stormwater can be more cost-efficient to build than grey infrastructure and it can be cheaper to maintain, but it does require ongoing maintenance. It can provide steady jobs along with natural beauty and essential bird and pollinator habitat while reducing the ravages of torrential rain on the city and its neighborhoods.

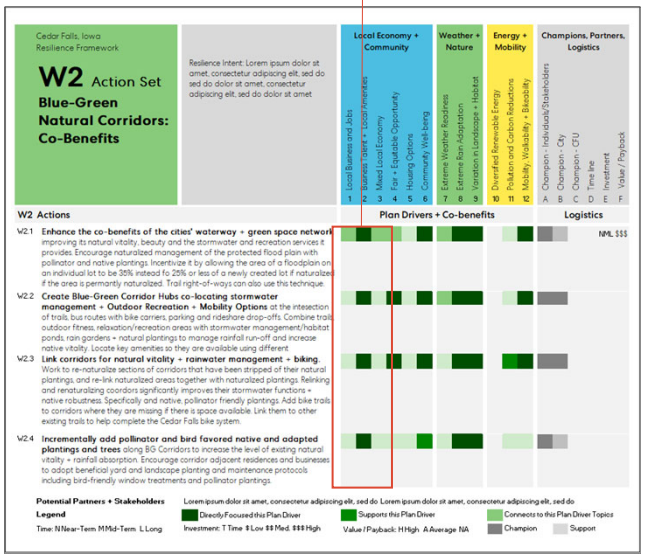
The Weather & Nature and Energy & Mobility categories are filled with local job and business opportunities, from the construction of energy-efficient homes and green infrastructure to repairing wind turbines and bikes, to selling electric vehicles, for example.

The voluntary use of hybrid and electric vehicles can have a positive impact on the local economy and job opportunities of Cedar Falls through the use of regionally produced and distributed wind and solar-generated electricity, sold through Cedar Falls Utilities instead of petroleum produced and imported from other regions of North America and beyond.

Local Business, Jobs and a Locally Diversified Economy

All three Resilience Plan Categories including Water & Nature and Energy & Mobility support the top three plan drivers focused on jobs and the local economy.

Look at the Action Set charts in all three Resilience Plan categories to identify actions that support local business, attract business talent and support a diversified local economy



Weather & Nature

Weather & Nature

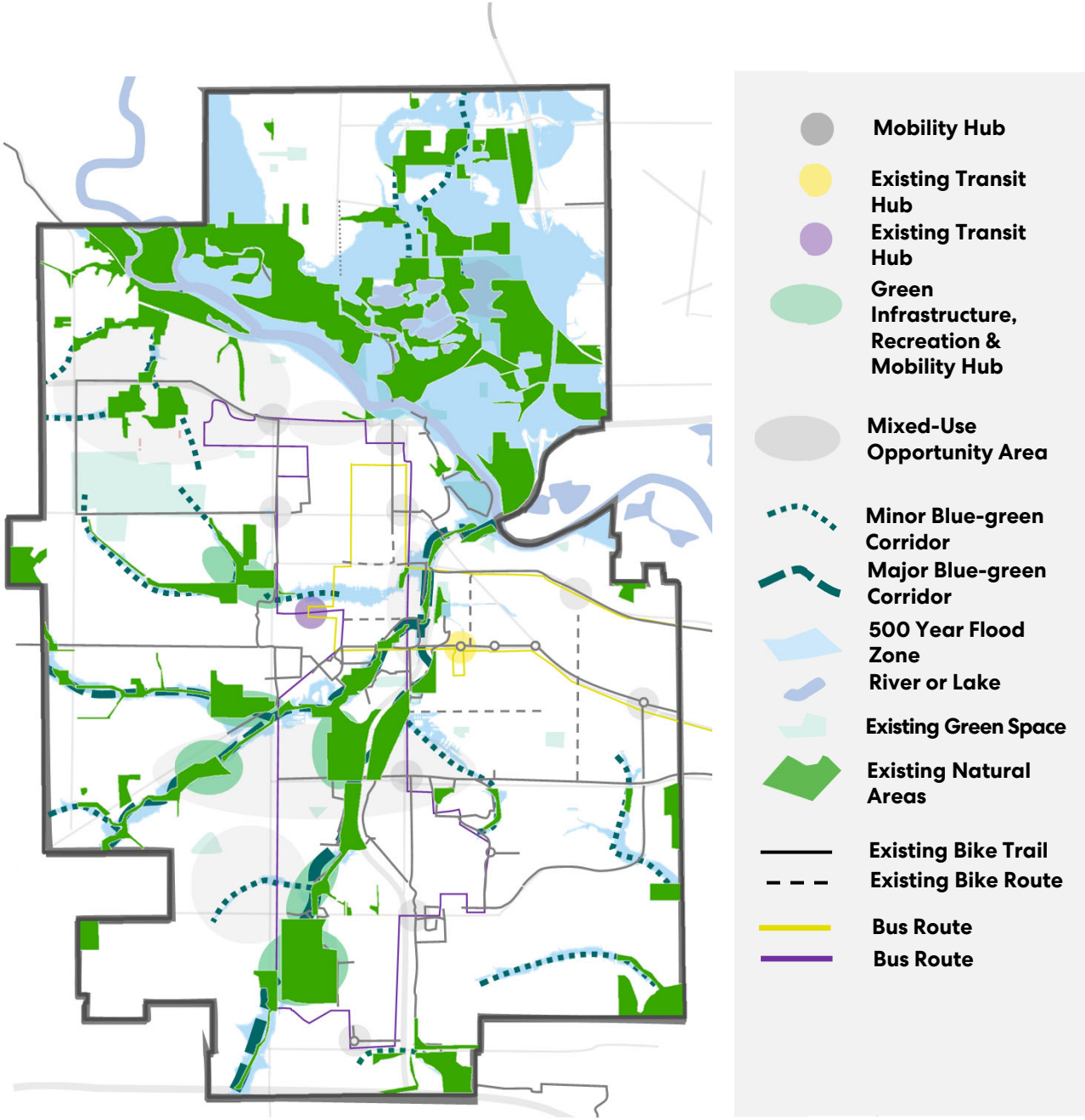
Figure 12.
An Abundance of Natural Amenities

Cedar Falls has a bounty of natural resources and amenities that are both public and private. George Wyth State Park is a notable public amenity across the Cedar River east of downtown. The Cedar River and the network of green spaces along its streams and tributaries are also significant amenities that are comprised of both public and private land.

Public amenities begin to offer excellent, immediate natural outdoor opportunities just outside Cedar Falls residents' door. They are high-value amenities for attracting talent, regionally and nationally, which is high on the list of priorities for Resilience Plan participants. Private land-owners can be encouraged to voluntarily implement land-management practices that support the vitality of the corridors. See the Action Sets and recommendations included throughout the Plan for more information.

The Opportunity of Blue-green Corridors

The streams and tributaries of the Cedar River offer substantial opportunities for multi-functional adaptation. They can be extended, improving their network to provide added recreation, bike commuting, and natural areas while managing stormwater from future



Weather & Nature

Blue-green Corridors *continued*

development and rain events resulting from the shift in weather.

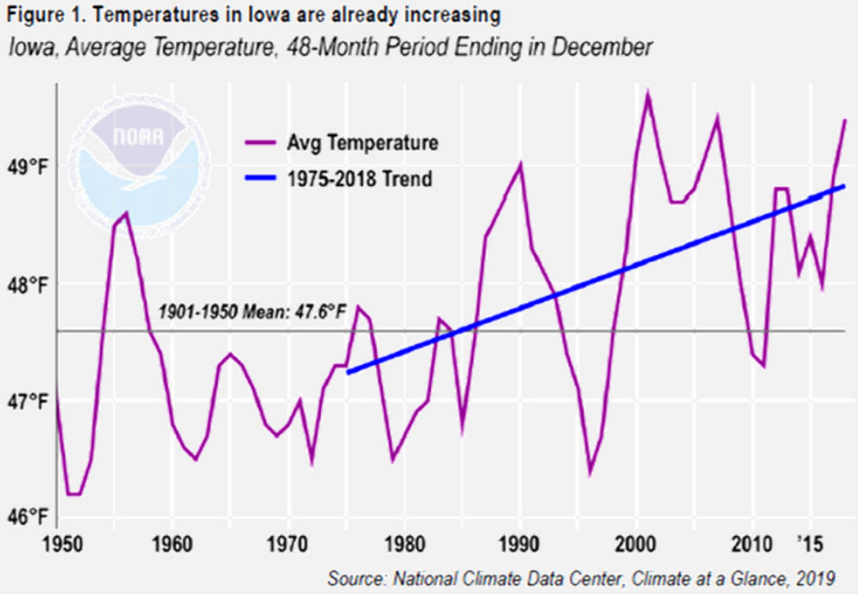
There are excellent opportunities available for continuing the work on the bike route system. Eliminating dead ends, filling short gaps, expanding wayfinding and using the City's low-volume grided street pattern will make the bike system to be more effective for commuting. Enhancing the bike route system can be coupled with a locally operated hybrid vehicle rideshare system equipped with commuter bike racks. Combined with the bike carriers on the bus system, this could make bike commuting much more feasible and reliable in Cedar Falls.

Along with containing some of the city's existing bike trails, Blue-green corridors can intersect with other bike trails, the bus system, and city streets. These intersections offer an opportunity to co-locate amenities: Green stormwater infrastructure, recreation, and mobility options.

The land area surrounding the Blue-green corridors typically falls within the regulated, undevelopable floodplain and can offer space for trails and naturalization if they are not already natural. Many areas already have trails. Trail or conservation easements can be swapped for development privileges, allowing a more significant percentage of newly platted but not developable lot area to be in the floodplain (if the area is designated a permanent natural area).

Existing natural areas can potentially be enriched with native and adapted species to increase the variation in plants and reduce the need for pesticides which can protect pollinators and wildlife.These areas can also provide excellent habitat for pollinators. One of the best pollinators in North America and a native of Iowa is the Rusty Patched bumble bee. The Rusty Patched is on the endangered list and most of its remaining habitat is in urban areas. Pollinators are an essential part of the food and agriculture system providing irreplaceable and high-value services worth billions of dollars.

Figure 13. Iowa Temperatures are Increasing



The weather is warming in Iowa and all indications are it will continue to do so. See the 'Energy & Mobility' category for more information on warming weather trends. The warming trend effects the moisture quantities in the air influencing both rainfall amounts and wind speeds during storms. Wind speeds such as those in the 2020 Derecho are accelerated by increased atmospheric energy contained in more moist air. The more moisture, the more energy.

Weather & Nature

The Risk of Flooding

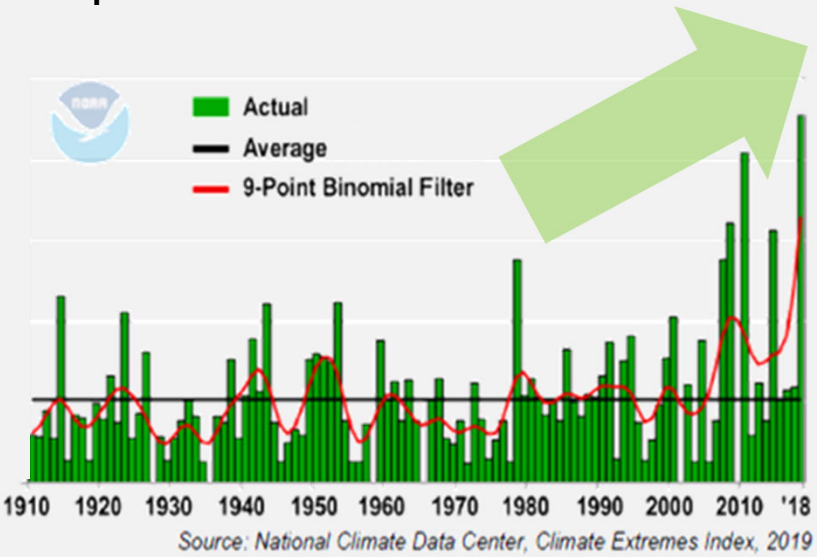
The City of Cedar Falls has done an outstanding job of managing riverine flooding of the Cedar River and its tributaries. The City regulates riverine flooding in the 500-year (0.2% annual chance) floodplain, which is a wise and prudent choice. Building floor elevations are tied to the 500-year flood event and development is limited in the flood plain. The City also has an active buyout program to mitigate property owners' costs to move homes and businesses out of harm's way, and for setting aside land for the floodplain storage as well.

Unfortunately, torrential rain events are now becoming more and more prevalent. This change in rain patterns is causing extreme, localized flash flooding across the region (see Figure 14). Flash flooding is a rapid influx of water in low-lying areas, channels, streams, streets, roads, yards and other locations. Noticeable volumes of water can collect in places not normally thought of as being at risk. It can be pools of water but is often moving or dangerously fast moving.

Newer design criteria (NOAA Atlas 14) include more recent rainfall data showing that the depth of rainfall for a given yearly occurrence is greater than previous 20th-century data (TP-40). Future uncertainty exists. The design and engineering criteria for rainfall may increase further in the future when new years of data are incorporated (for example, mid-century projections indicating Atlas 14 may be under-representing the potential for the frequency and magnitude of extreme storms)

Localized "urban" flash flooding is expected to continue and the City as a whole will need to adapt. Some areas of the City lack storm water pipes and rely on the streets to drain it away the rainfall. In other cases, the system was designed under different precipitation conditions than are present today. The capacity of the current stormwater system will need to be incrementally increased over time.

Figure 14. Upper-Midwest One-Day Extremes, April-September



Source: National Climate Data Center, Climate Extremes Index, 2019

The Upper-Midwest has experienced a 42% increase in the amount of rain during major rain events over the past 40 years

The weather has been measurably warming in Cedar Falls and Iowa (see Figure 13). As a result of the warming, the air holds more moisture and the Jet Stream has slowed. As a result, major rain events are larger than in the past and sometimes slower to move on. Over the past 40 years there has been a 42% increase in the amount of measured rain falling during days ranking in the upper 1% of annual precipitation events.

Major rain events are likely to become even more extreme as temperatures continue to rise (see Figure 13 and 14). Existing stormwater systems are designed to manage rainfall quantities from the past, not the new rainfall amounts being recorded today or anticipated in the future. Stormwater management is an important issue now and into the future for Cedar Falls.

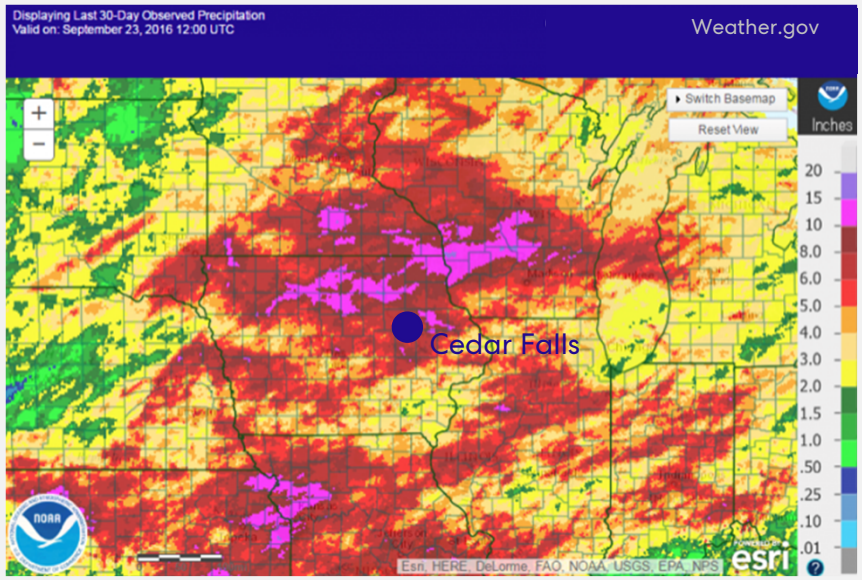
Weather & Nature

Risk of Flooding *continued*

The City is conducting drainage basin studies and will be using that to systematically make improvements. The City has been making these improvements as roads, and other infrastructure is reconstructed. That work should continue, and the effort should be expanded using both green and conventional stormwater infrastructure.

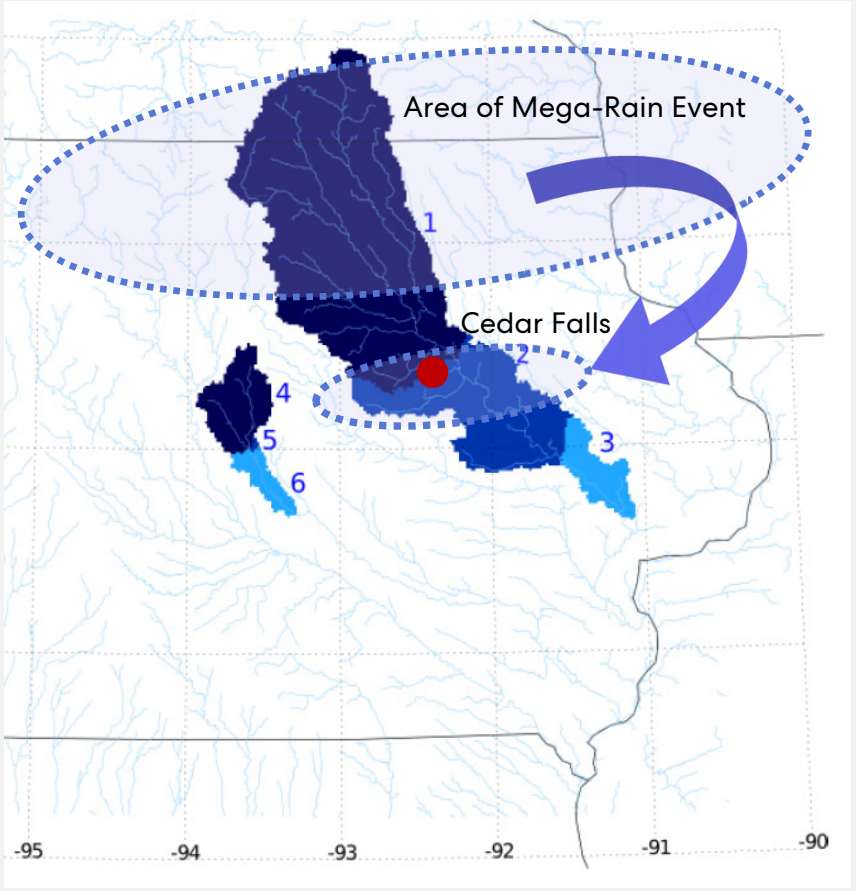
Extreme Storms & Urban Flash Flooding Risk

Figure 15. 2016 Mega-Rain



Heavy Rainfall in Late September 2016 deluged parts of the Upper Midwest, including Northern Iowa where 5-15 inches of rain fell over several weeks. The primary rain event missed Cedar Falls.

Figure 16.
2016 Primary Mega-Rain Event missed Cedar Falls



If the 2016 primary mega-rain event was centered over Cedar Falls and the local watershed, localized urban flash flooding would have been a likely result.

Weather & Nature

	Technical Paper 40 (TP-40) [4] (Cedar Falls)	Bulletin 71C Rainfall Midwest [3] (Cedar Falls)	NOAA Atlas-14 [2] (Cedar Falls)	NOAA Atlas-14 [2] (Cedar Falls)	NOAA Atlas-14 [2] (Cedar Falls)	Northeast IA September, 2016 Rainfall	Mid-Century Dakota County, MN [1]
Period of Record	1940-1958	1948 - 1992	1980 - 2010	1980 - 2010	1980 - 2010	(Actual)	Projection
			90-Percent Confidence Limit		90-Percent Confidence Limit		
Event Recurrence		inches rainfall	inches rainfall (low-end)	inches rainfall (avg)	inches rainfall (high-end)		
1-year X 24-hour			2.36	2.64	3.01		
2-year X 24-hour		2.9	2.74	3.06	3.49		
10-year X 24-hour		4.2	3.99	4.5	5.15		
100-year X 24-hour	6.3	6.5	6.02	7.33	9.03		8.81 (2050's)
500-year X 24-hour			7.46	9.78	12.6	10.00 - 12.00	
1000-year X 24-hour			8.11	10.9	14.2		

Sources: 1 Future Design Storm Values for Inver Grove Heights, Minnesota. Description of Extreme Rainfall Projection Methodology & Results. Risk Sciences International. 2019.

2 Atlas 14: Precipitation-Frequency Atlas of the United States, Volume 8. 2013.

3 Huff, Floyd A., and James R. Angel. Rainfall Frequency Atlas of the Midwest. Illinois State Water Survey, Champaign, Bulletin 71, 1992.

4 Hershfield. Technical Paper 40 (TP-40). U.S. Weather Bureau. 1961.

Figure 17. Cedar Falls, IA Design and Engineering Criteria for Rainfall Events

Newer design and engineering criteria (NOAA Atlas 14) includes more recent rainfall data. The data indicates that the depth of rainfall for a given yearly occurrence is greater than previous 20th-century data (TP-40). Extreme, mega-rains are becoming more common. As an example: The same area in Minnesota along the northern Iowa border experienced three 1,000-year rain events in less than 10 years – Faribault County: 10 Inches in 36 hours; the Town of Hokah: 15 inches in 24 hours; Amboy: more than 10 inches in two days.[1] What were previously 1,000-year rain events are statistically no longer 1,000-year events because three events have occurred back-to-back.

Future uncertainty exists. The design criteria for rainfall data may increase further in the future when new years of data are incorporated (for example, mid-century projections indicating Atlas 14 may be under-representing the potential for the frequency and magnitude of extreme storms). Emergency planning and design for extreme rain events based on what was previously considered the 500-year or 1,000-year event is now a prudent choice.

[1]MPR News: http://bit.ly/MPR-News-Rain [2]Minnesota DNR: https://www.dnr.state.mn.us/climate/summaries_and_publications/mega_rain_events.html

Weather & Nature

Figure 18. Cedar Falls Stormwater Planning & Design Criteria

Stormwater Management	Current Practice (Existing Default)	Enhanced Resilience Practice
Water Quantity & Quality (1.25-inch rainfall)	City Code1 Sec 24-339 (c)(2)(a) "...Rainfall events, up to and including 1.25 inches of rain, shall be released at a continuous rate over 24 hours or provide an adequate maintenance and repair agreement to manage this level of rainfall event off site. Iowa Storm Water Management Manual: 1.25-inch rainfall 95th percentile cumulative occurrence frequency.	Enhanced Design Criteria: Capture and retain 1.25 inches of runoff from impervious surfaces for volume control using a Low Impact Development (LID) approach; rate and volume of predevelopment stormwater reaching receiving waters to be unchanged. Refer to Middle Cedar River Model Stormwater Ordinance, (6) Stormwater Volume Reduction Performance Standards. February 2020 Middle Cedar Watershed Management Plan, Appendix H.
Peak Flow Attenuation (100-year x 24-hour rainfall)	City Code1 Sec 24-339 (c)(2)(b) "...All rainfall events greater than 1.25 inches of rain and up to the 100-year rainfall event shall be released at the rate of the two-year frequency rainfall event on the site as it existed in its natural, undeveloped state." Iowa Storm Water Management Manual: Atlas 14, 100-year x 24-hour, **50-percentile** mean rainfall of: **7.5 inches**	Enhanced Design Criteria: Rain events shall be managed on-site, or developers may provide district level management supporting multiple properties. All rainfall events greater than 1.25 inches of rain and up to the 100-year rainfall event shall be released at the rate of the two-year frequency rainfall event on the site as it existed in its natural, undeveloped state." For 100-year rainfall, assume Atlas 14, 100-year x 24-hour, **95-percentile** mean rainfall of: **9.0 inches:** (10% to 20% increase in infrastructure capacity)

[1] Cedar Falls, IA Code of Ordinances Chapter 24, Article VI Post-Construction Stormwater Control

Figure 19. Cedar Falls Extreme Rain Emergency Planning & Design Criteria

Peak Flow Attenuation (Extreme Rain Events)	Extreme rains are a relatively new phenomena. As result they are not currently addressed. Extreme rain events now have a history of occurring repeatedly in Iowa and Upper-Midwest. Establishing a practice approach to these events is now prudent Building infrastructure to fully manage the upper limits of extreme rain events may be cost prohibitive. Emergency management of these events would anticipate fully managing a known quantity of extreme rain while planning for some rain to inundate select streets and low-lying areas. These areas and flow paths leading to them would be designed to minimize damage due to inundation & scouring.	Enhanced Design Criteria: For all extreme rainfall events greater than 100-year rainfall assume the Atlas 14, 500-year x 24-hour, 95-percentile mean rainfall of: **12.6 inches:** (40% to 75% increase in infrastructure capacity) Extreme rain events shall be emergency managed either on-site or off-site in regional storage and released at the rate of the two-year frequency rainfall event on the site or district as it existed in its natural, undeveloped state. Identify and set-aside area for future storage and management capacity up to a 1,000-year x 24 Hour, 95-percentile mean rainfall of: **14.2 Inches:** (60% to 100% increase infrastructure capacity)

Weather & Nature

Figure 20. Stormwater and Extreme Rain Management

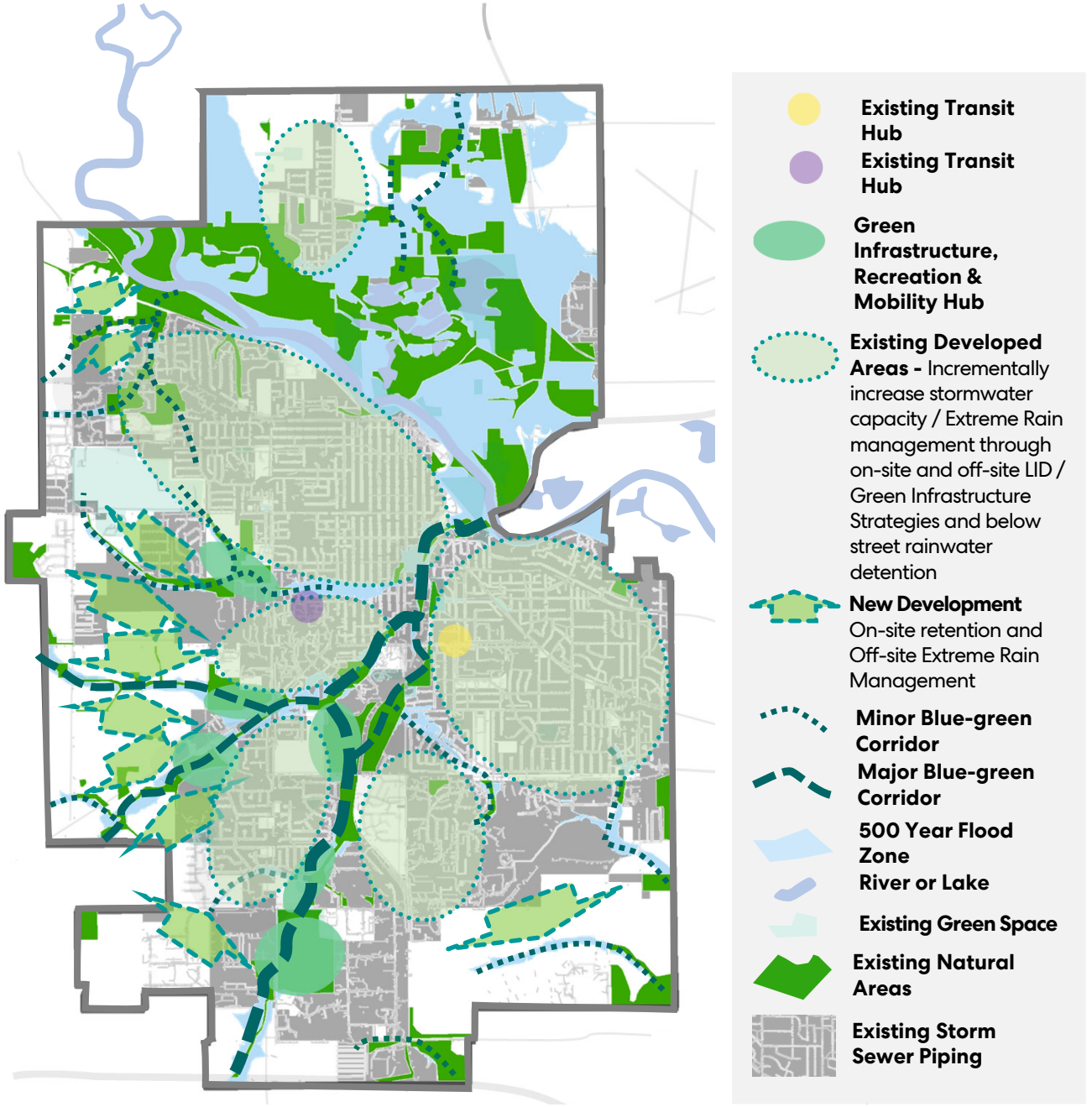
Where storm sewer network capacity limits how much extreme precipitation can be conveyed downstream, installing runoff storage at various points in the network can be beneficial to throttle flows and lessen the degree the sewer system is overwhelmed.

Upstream storage may be effective to lessen downstream tailwater constraining sewer outfall capacity.

Storage at branches of the network further downstream and within existing developed neighborhoods may be necessary to mitigate local problematic low areas where runoff from extreme precipitation falling on impervious surfaces is likely to collect. Mixing regional/district storage and distributed storage throughout sub-watersheds should be considered, focusing implementation where detailed stormwater modeling indicates the greatest peak flow attenuation benefits.

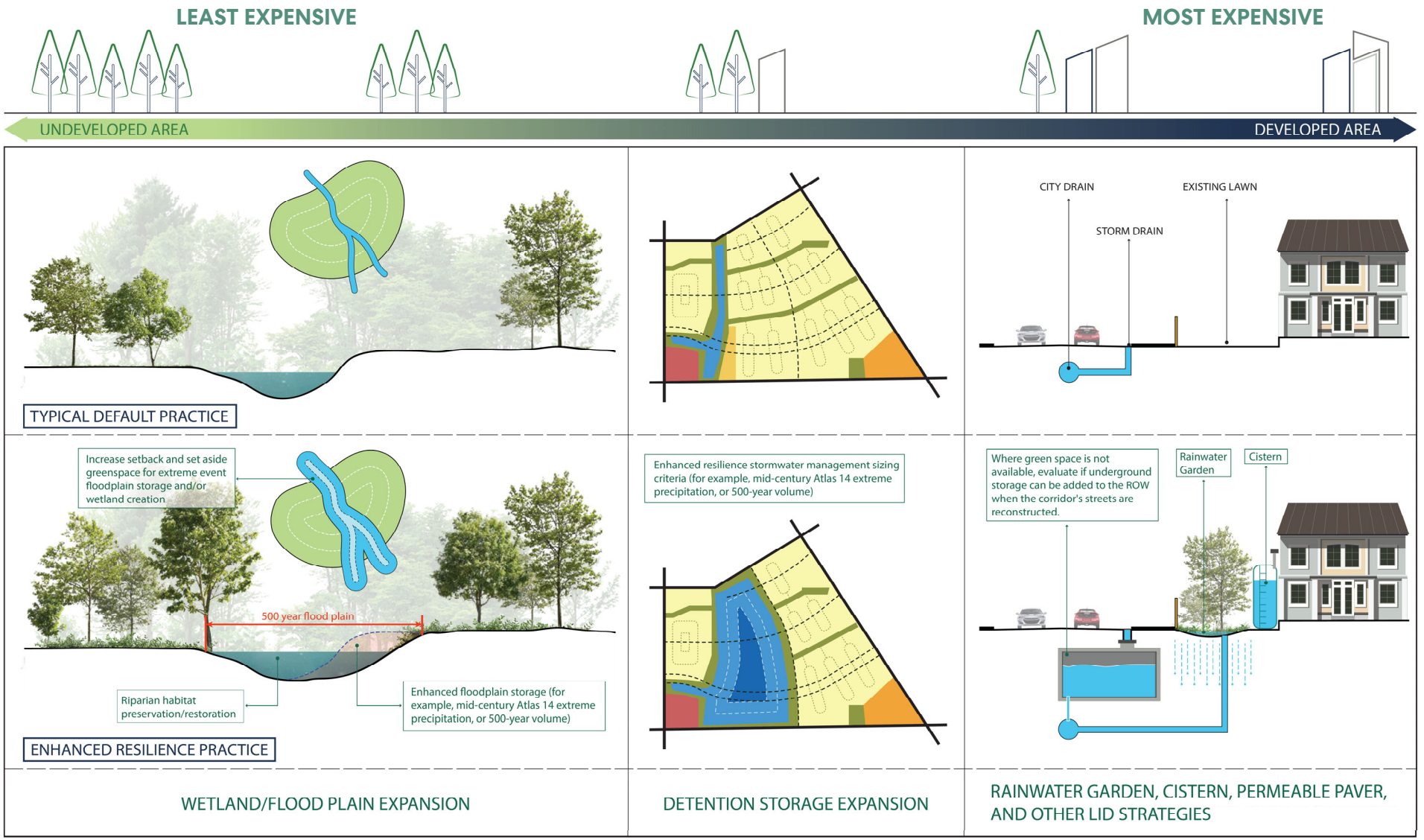
Focus on the use of Low Impact Development (LID)/Green Infrastructure both to reduce first costs and to take advantage of the natural co-benefits it can provide. Common construction costs of underground stormwater storage can exceed $20/CF, compared to $12-18/CF for distributed LID practices and $5-8/CF for surface retention storage/green-infrastructure.

Refer to Figure 21. for LID/Green-infrastructure strategies.



Weather & Nature

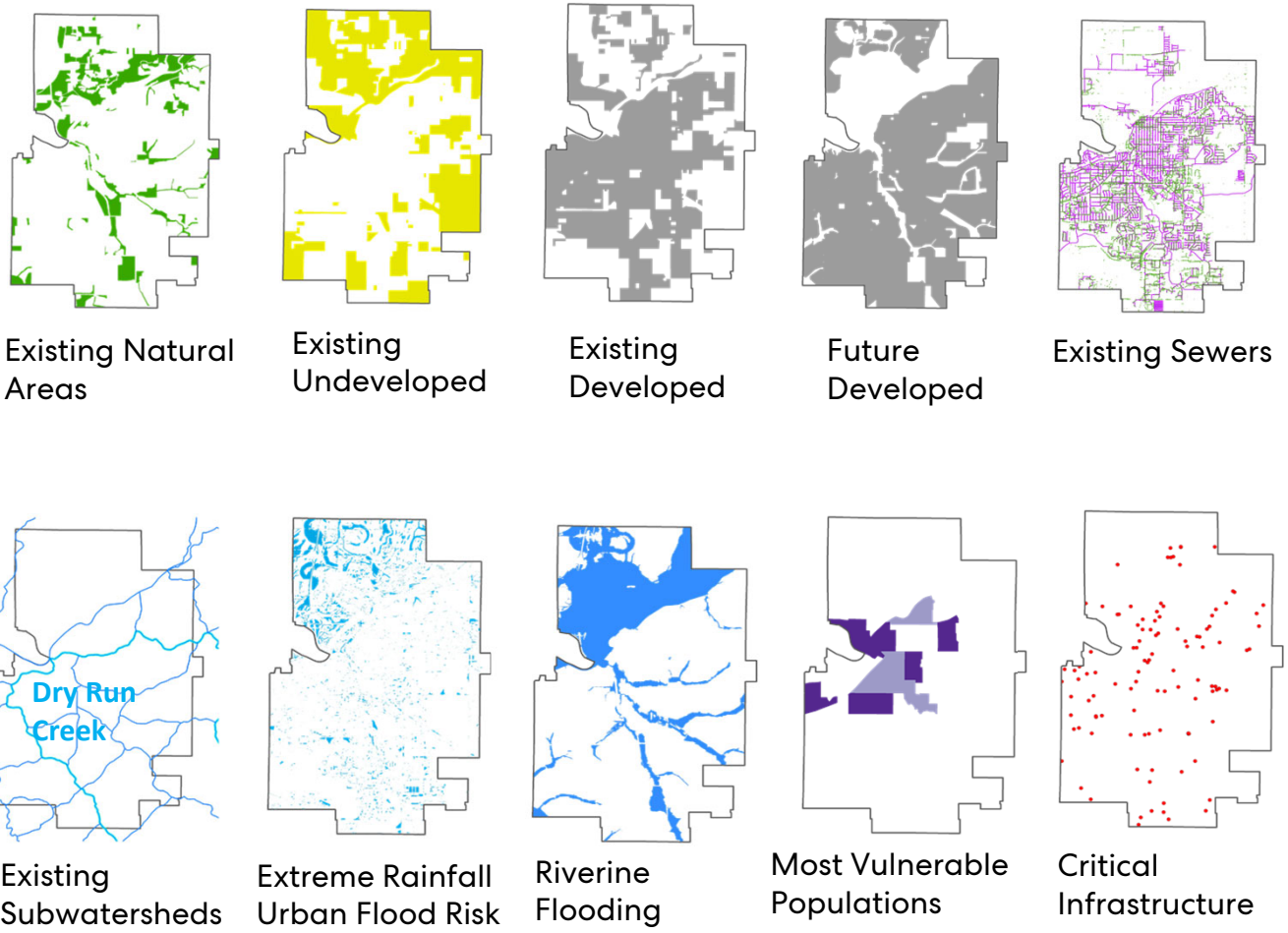
Figure 21. Distributed LID and Green-Infrastructure Rain Management Strategies



Weather & Nature

GIS Figure 22. GIS Toolbox for Site-Specific Resilience Assessments

The plan development included gathering and integrating existing City, County and watershed GIS data into a single GIS Toolbox geodatabase. Information included, such as critical infrastructure locations, urban flash flood screening layer, and population vulnerability are intended to serve as a resource to evaluate site specific flood resilience issues. This information can serve as a screening tool for individual capital improvement projects, the overall capital improvement program or to inform a review of private-developer proposed projects. Understanding the context upstream and downstream of project sites can help frame project-specific opportunities for creating additional extreme precipitation flood storage, lower risk runoff overflow features and the necessary freeboard (overflow) to protect private and public property from damage due to flash flood stage on streets, green space and parking lots.



Examples of GIS Toolbox Data

The geodatabase developed during this Plan work is intended to serve as a screening tool for the City's use to prioritize urban flash flood risk reduction projects early in the formulation of individual projects, during plan review and during capital improvement planning

Weather & Nature

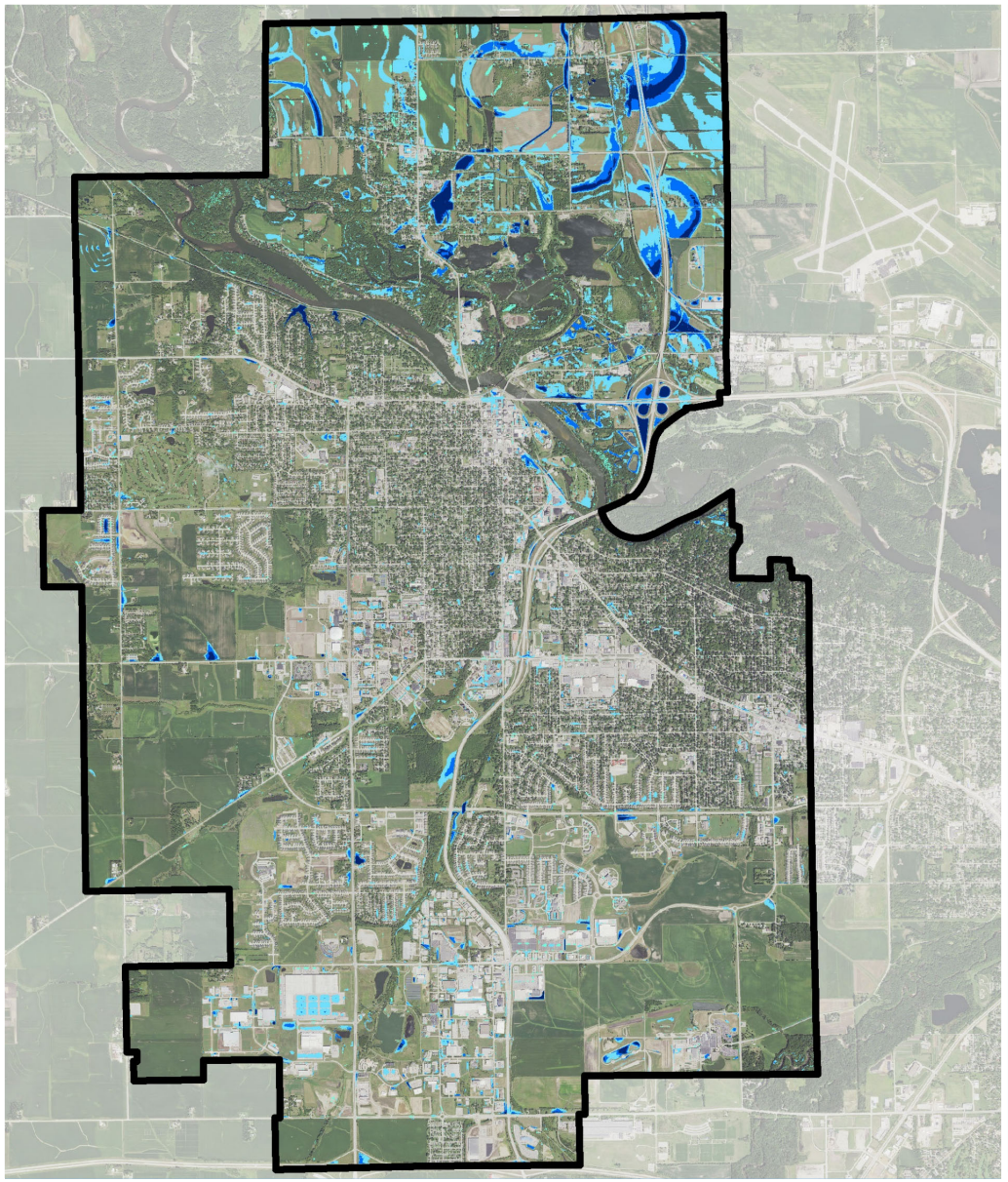
GIS Figure 23. Urban Flash Flooding

Extreme precipitation flood risk may damage assets and property that are not in mapped riverine floodplains.

When formulating capital improvement plans and private developments, the resiliency GIS datasets provided with this Plan can be used to screen areas for surface and basement flooding risk due to extreme precipitation that may overwhelm the existing storm sewer network's ability to convey water downstream.

Some low areas may have storm sewer networks that can become overwhelmed when the inches/hour intensity of extreme precipitation exceeds their design assumptions or when downstream basins and creek levels rise, creating tailwater that reduces the flow capacity of the sewer network. Combinations of these factors can cause storm sewers to back up, surcharge and create ponding on streets and in low areas. This may create safety risks to motorists and property risk to basements and buildings.

For future sanitary sewer system improvements, overlay the GIS-dataset layers for sanitary sewer structures/ networks and urban flood risk with the drainage basin study to identify those structures with the highest priority need for mitigating inflow-and-infiltration (I&I) due to floodwater pooling over them.

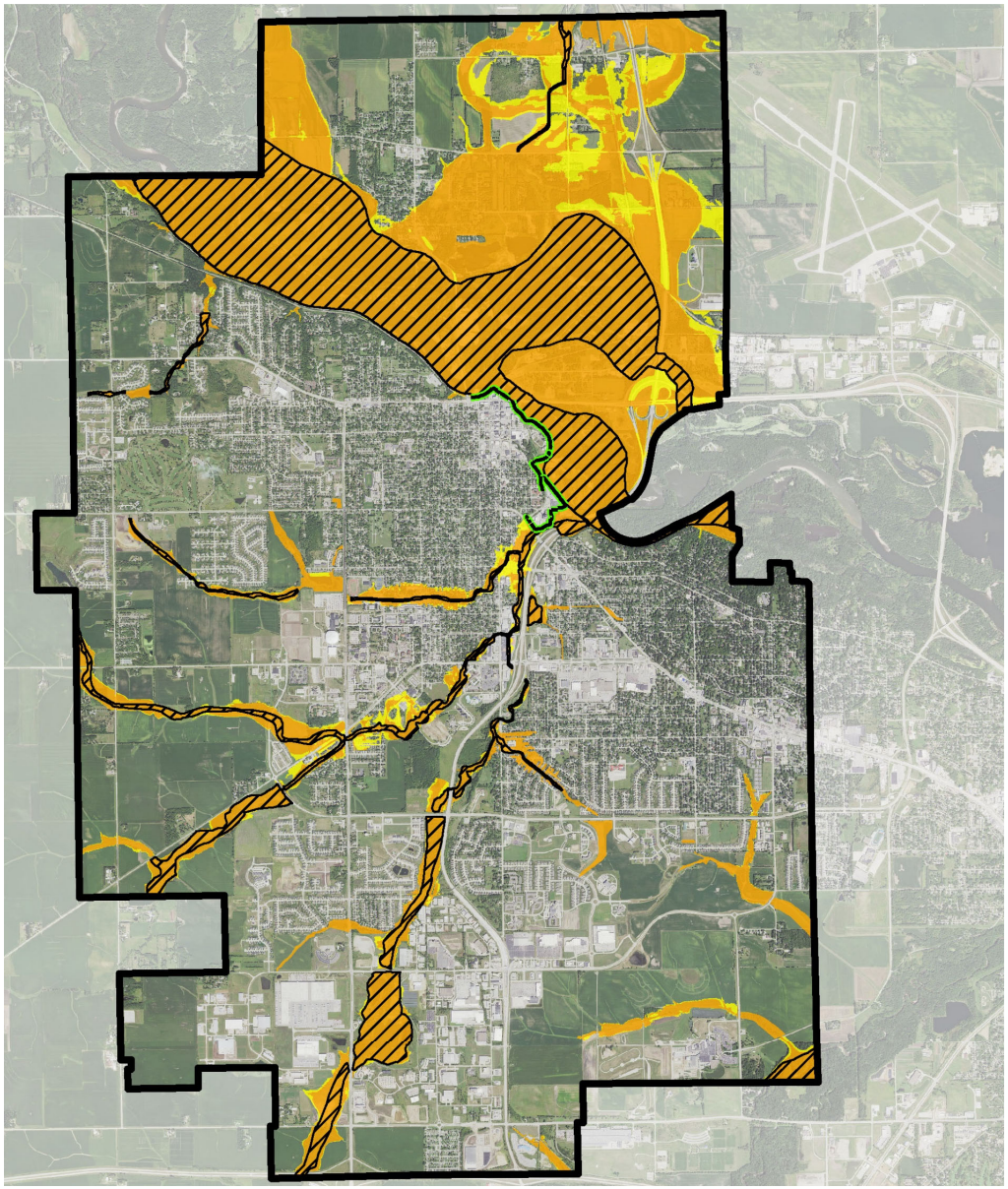


Weather & Nature

GIS Figure 24. Riverine Flooding

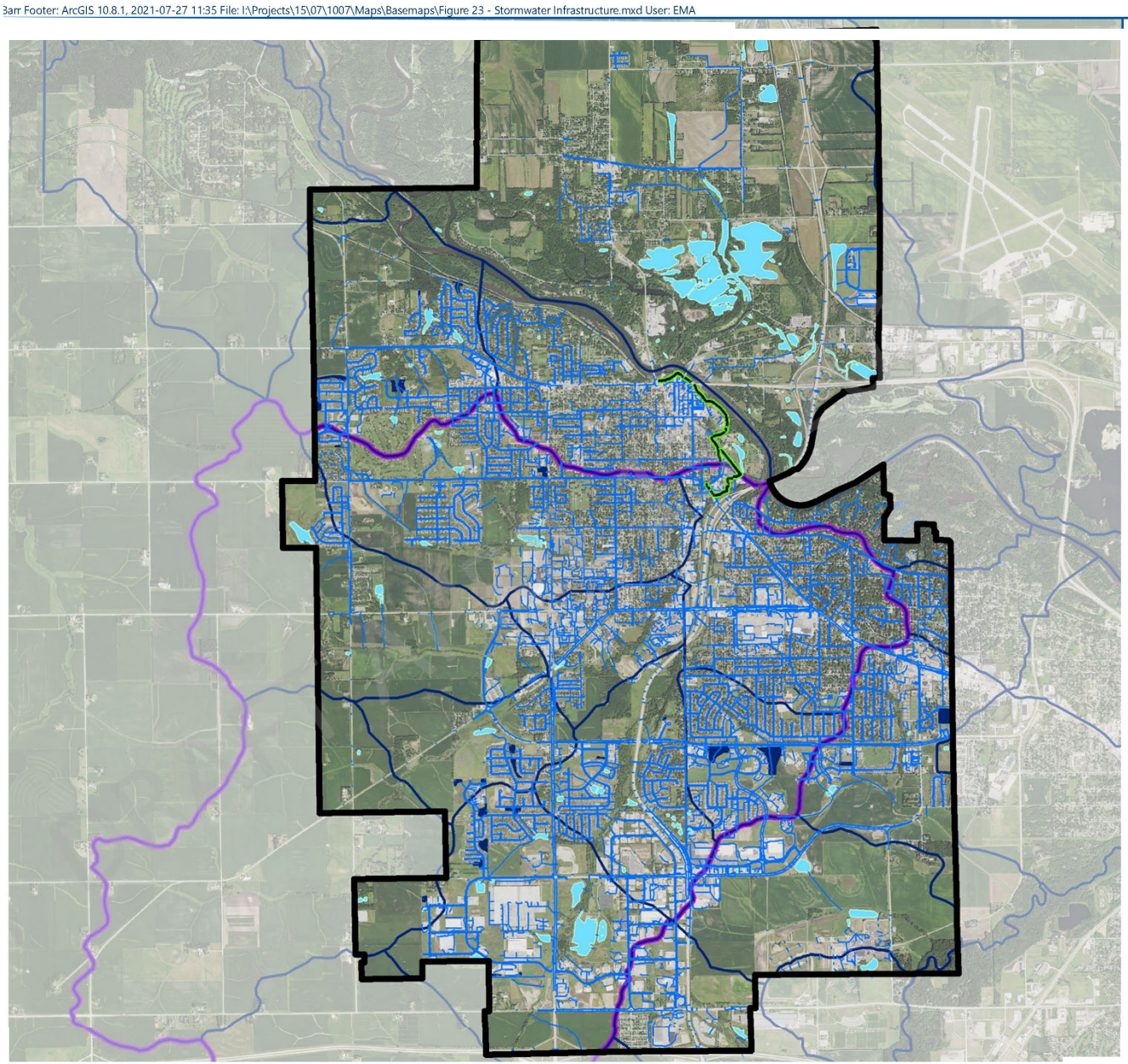
The City regulates riverine flooding for the 500-year (0.2% annual chance) flood plain, which is a wise and prudent choice.

Recognizing that extreme precipitation flood risk may damage assets and property that are not in mapped riverine floodplains, incrementally identifying and increasing runoff storage areas can help mitigate risk to unmapped areas.



Weather & Nature

GIS Figure 25. Existing Stormwater Infrastructure Summary



Weather & Nature

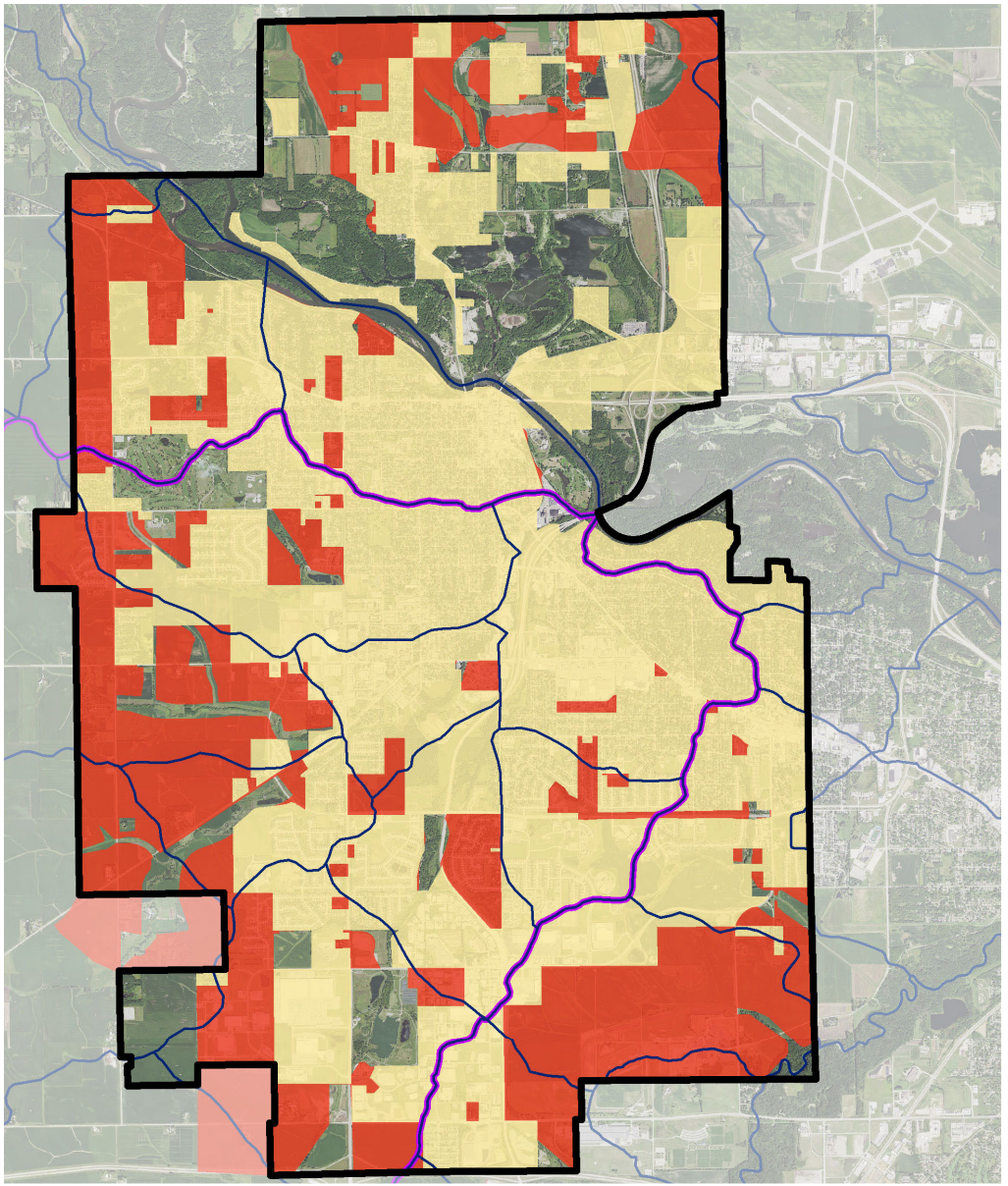
GIS Figure 26. Existing and Future Development Areas

Future precipitation uncertainty makes setting aside flexible green space to build flash flood resilience strategies attractive.

For undeveloped areas, allocating adequate green space for surface stormwater storage above and beyond current compliance thresholds is recommended to allow for future volume expansion. This can be accomplished with a mix of City land purchase, easements, development ordinances (such as riverine setbacks) and zoning requirements.

As a best practice approach to development, this plan recommends the City reduce impervious surfaces, use green infrastructure, and reuse stormwater for irrigation and design landscapes that don't require irrigation.

Distributed enhanced-LID: Some low-impact development (LID) features designed primarily for water quality benefits can be enhanced during design for additional runoff storage to throttle more extreme rainfall events. However, the design must limit the inundation depth and duration to avoid die-off of permanent vegetation. This generally leads to shallower, broader features that require a larger green space extent.



Weather & Nature

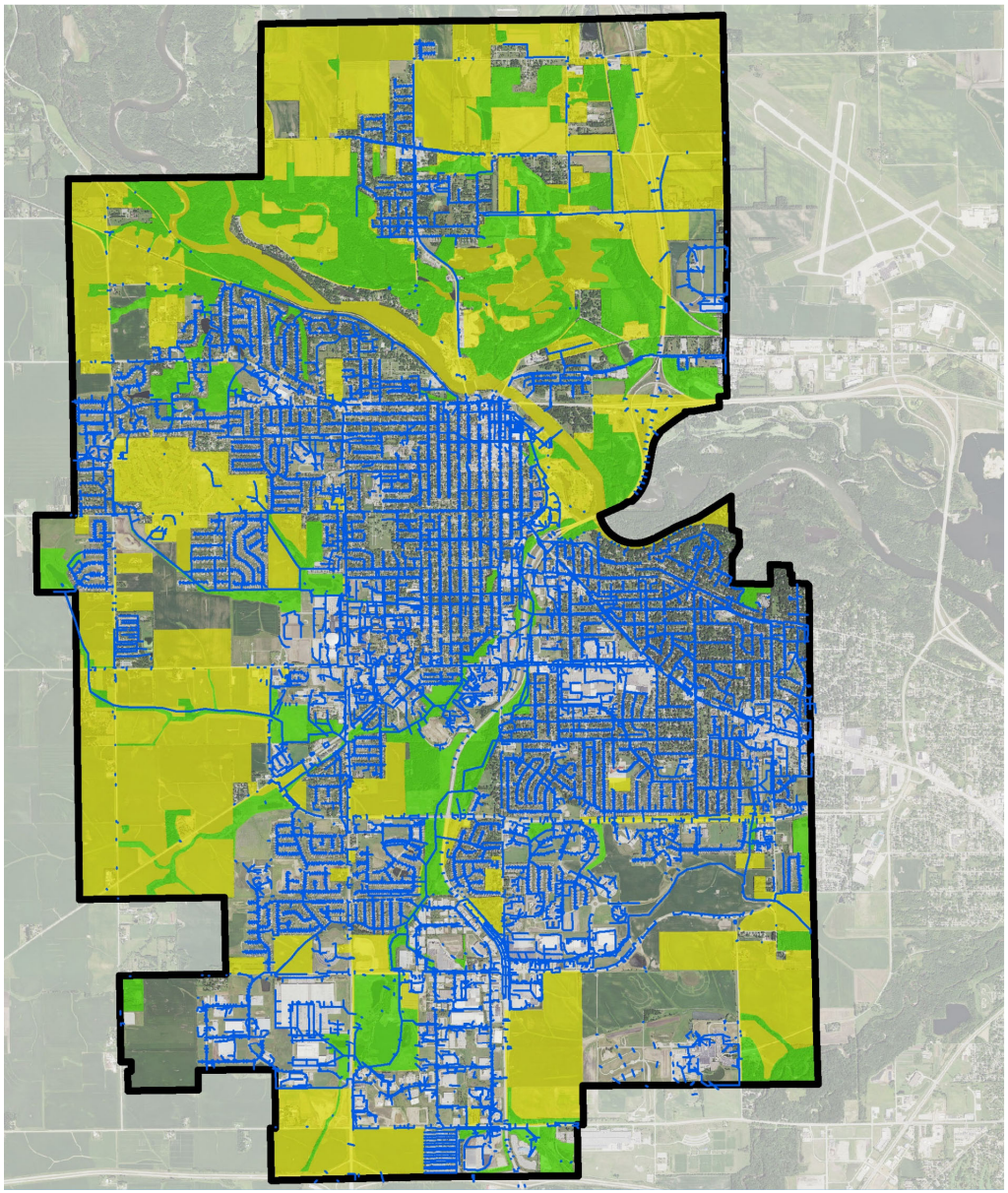
GIS Figure 27. Existing Natural and Undeveloped Land

Undeveloped areas upstream of developed Cedar Falls neighborhoods are high-value opportunity areas to set aside existing green space to create flood resilience storage areas.

Properly-sited and sized storage areas can combat the risk of extreme precipitation events causing flood impacts to downstream property. Leveraging the existing strengths of Blue-green corridors and habitat areas holds the potential to create flood storage sites that also generate habitat, biodiversity and recreation benefits for the community.

The existing storm sewer network, capacity and mapped floodplains are key factors that drive the need to "look upstream" for extreme precipitation storage areas.

Small, dispersed retrofit strategies located within existing developed and storm-sewered neighborhoods can be used to expand flood storage in areas at higher-risk of localized flash flooding on streets and at existing stormwater management facilities.



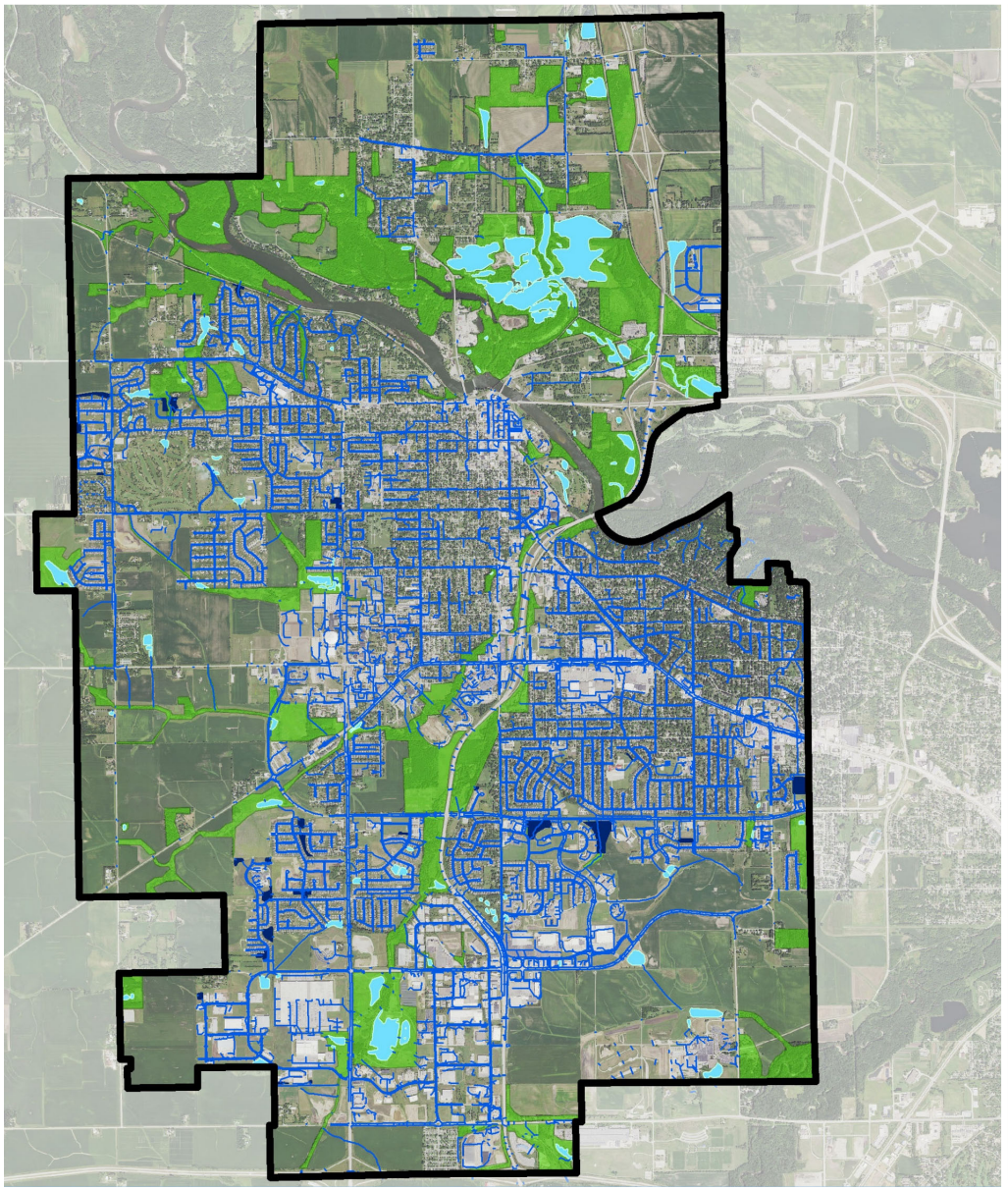
Weather & Nature

GIS Figure 28. Existing Natural Areas

Best practices for natural areas include protecting and restoring streams, wetlands, floodplains, and uplands. This can include: Protecting and enhancing streambank riparian habitats to reduce erosion during extreme flooding events and to provide ecological benefits. Other options are to preserve open space, natural areas and promote stormwater best management practices to landowners.

Available green space in developed areas of Cedar Falls is scarce. Context appropriate surface water storage techniques have a return-on-investment that is typically much greater than underground retention systems, largely due to lower construction costs, lower maintenance costs and increased green space-associated benefits.

Opportunities to expand floodplain and expand wetlands on these corridors are high return-on-investment improvements. The City could consider purchasing private land, platting it as buffer area or a setback and public land for the intended use as future extreme precipitation floodplain storage and habitat expansion. For the purpose of optimizing the downstream stage reduction benefit of these floodplain expansions, consider engineering water control structures at road crossing, culvert, etc. where appropriate.



Weather & Nature

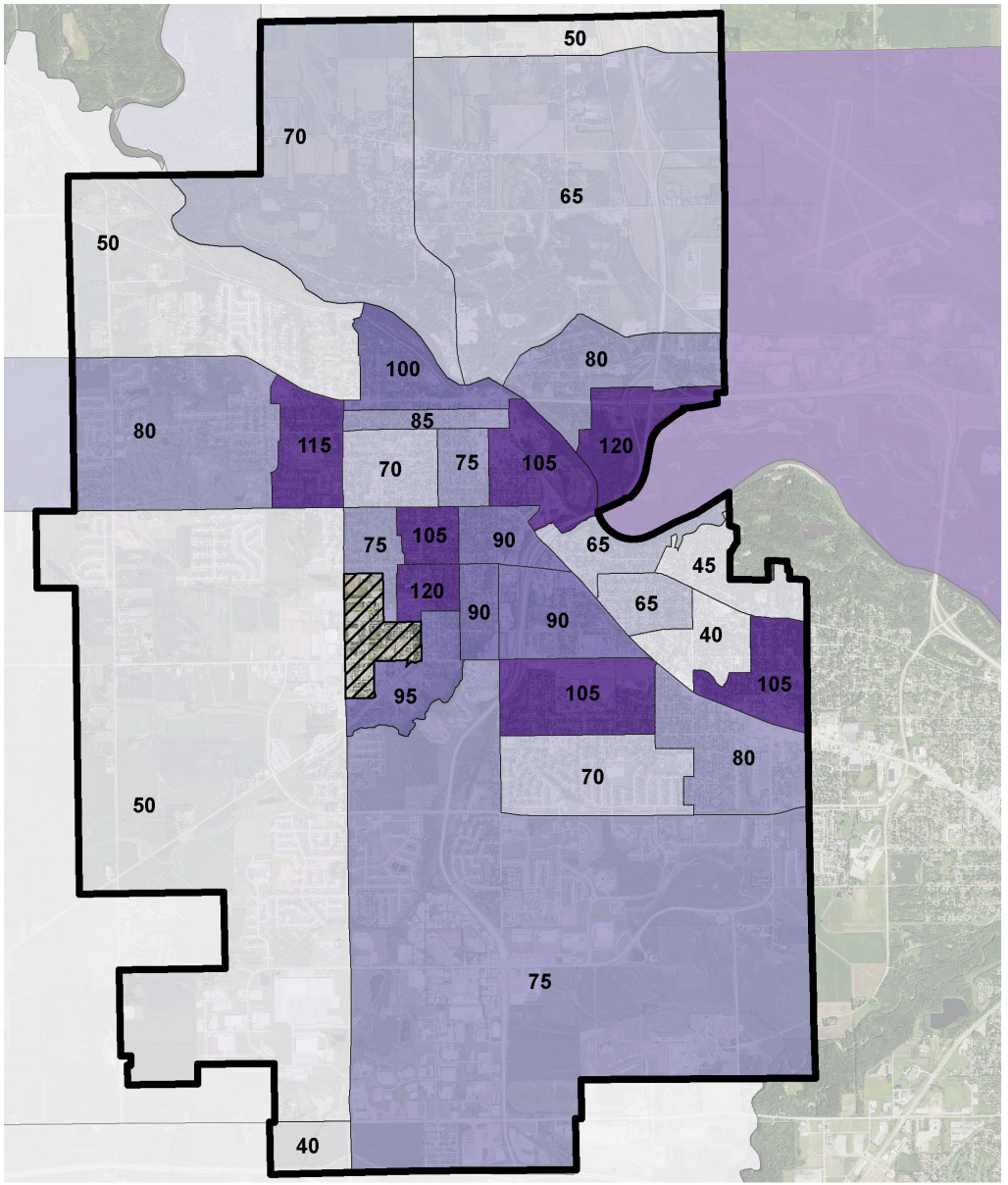
GIS Figure 29. Population Vulnerability to Extreme Weather and Flash Flooding

Vulnerable populations in general have fewer resources available to help them adapt in advance of extreme weather and to recover from damage when extremes hit.

Mapping of the relative population disparities in Cedar Falls indicates the density of the most vulnerable populations in the city are located at the downstream portions of the watershed. Consider this equity disparity (quantitatively or qualitatively) during future benefit/cost assessments of upstream flood-risk reduction projects in undeveloped portions of the watershed.

The population vulnerability indicator was developed using the following socio-economic datasets, similar to other regional resiliency plan population vulnerability mapping:

Population density
Median household income
% of population under 18 years old
% of population over 65 years old
% of population that are people of color
% of rental housing units
% of population with limited English proficiency
% of households receiving SNAP benefits
% of population that did not graduate High School



All of society is vulnerable to changes in climate, but underlying disparities cause some populations to be more sensitive to climate change impacts and have fewer resources to respond or adapt. To identify population vulnerability in Cedar Falls, nine Census[1] variables were analyzed. For each variable, data were classified into five groups, and a score of 0 to 20 was assigned to the Census Block Group. The variable scores were added together for each Block Group to create the composite scores shown in the figure. The higher the score, the greater the population vulnerability. An observed pattern is existing developed neighborhoods with higher relative population vulnerability face more physical constraints than undeveloped areas when trying to implement/construct flash flood mitigation projects.

Composite Score

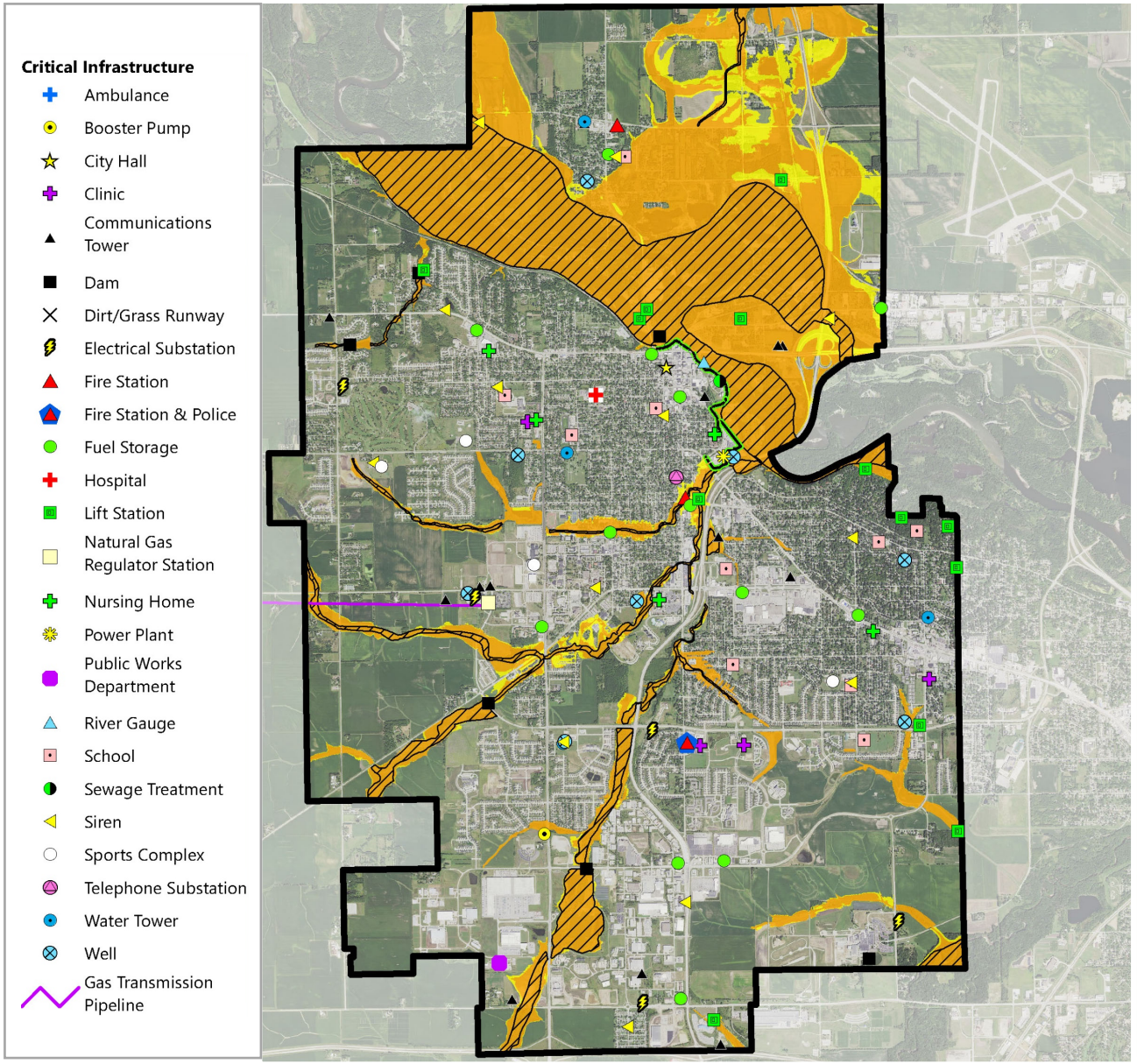
- NA*
- 40 - 50
- 51 - 70
- 71 - 85
- 86 - 100
- 101 - 120

least vulnerable → most vulnerable

Weather & Nature

GIS Figure 30. Existing Critical Infrastructure

Protecting critical infrastructure from flooding is a priority when performing urban flash flooding risk assessments and during formulating of future capital improvement projects and private developments.



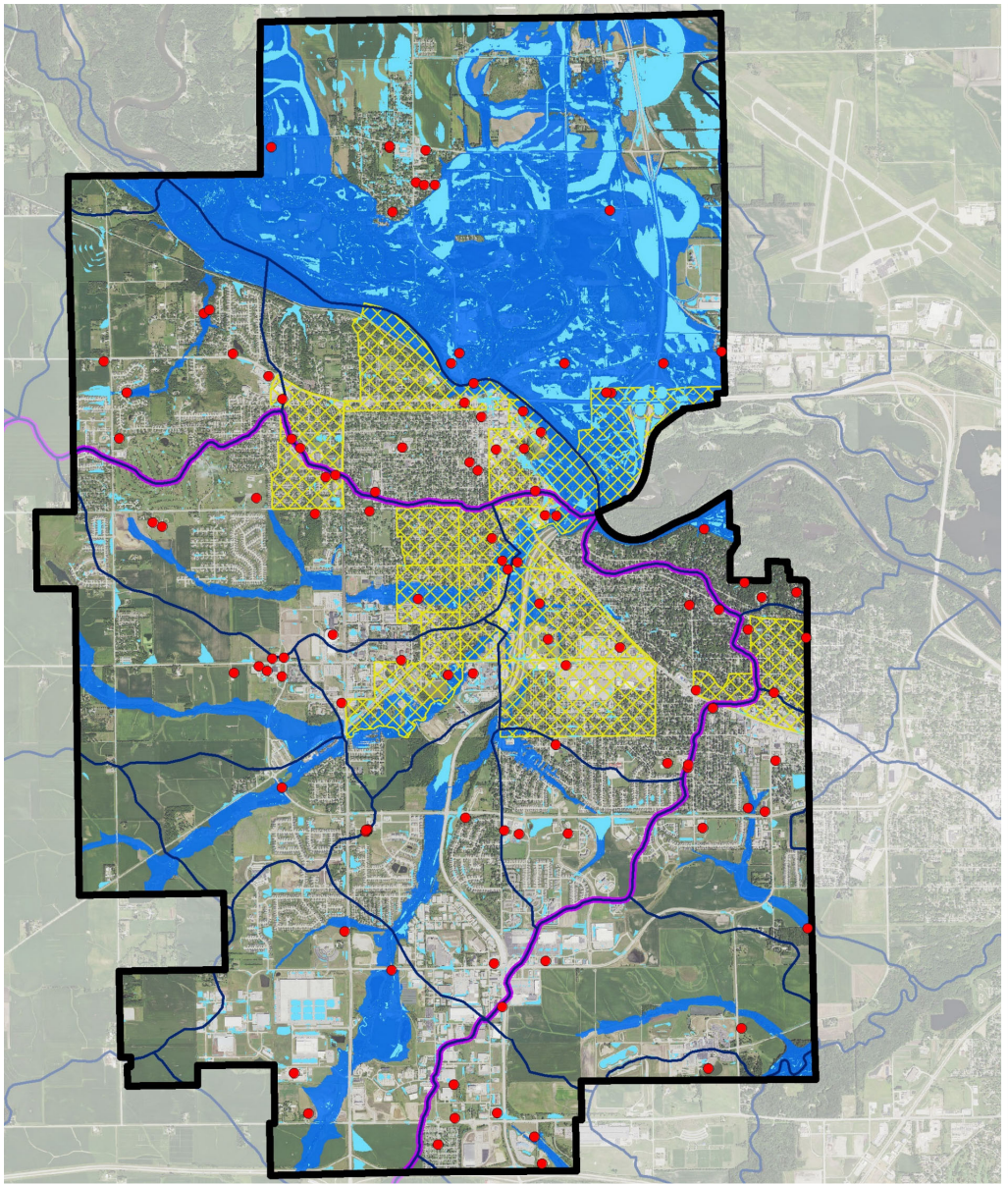
Weather & Nature

GIS Figure 31. Flood Risk Composite (from Riverine and Urban Flash Flooding)

The City of Cedar Falls implements progressive risk-reduction strategies and ordinances within the 500-year riverine floodplain. In addition to riverine flooding, locally low basin-shaped areas could be at risk of extreme precipitation urban flooding if storm sewer infrastructure capacity is exceeded leading to on-street, basement, and at-risk property flooding. Critical infrastructure facilities are a key target for further evaluation and risk reduction. These localized flooding areas are not always along creeks or rivers and sometimes not in mapped floodplains, making them a future resiliency challenge for the City to address.

Each flash flooding site identified is a candidate for a local detailed evaluation for a buyout or for adding flow capacity, lower risk overflow features and added extreme precipitation runoff storage.

It is recommended to overlay and integrate flash flooding areas and sanitary sewer networks with drainage basin studies and capital improvement planning as a screen for possible infiltration and inflow (I&I) locations and mitigation. Refer to the GIS Datasets & Toolbox included in this plan.



Energy & Mobility

Energy & Mobility

Low-Cost Electricity and Fuel

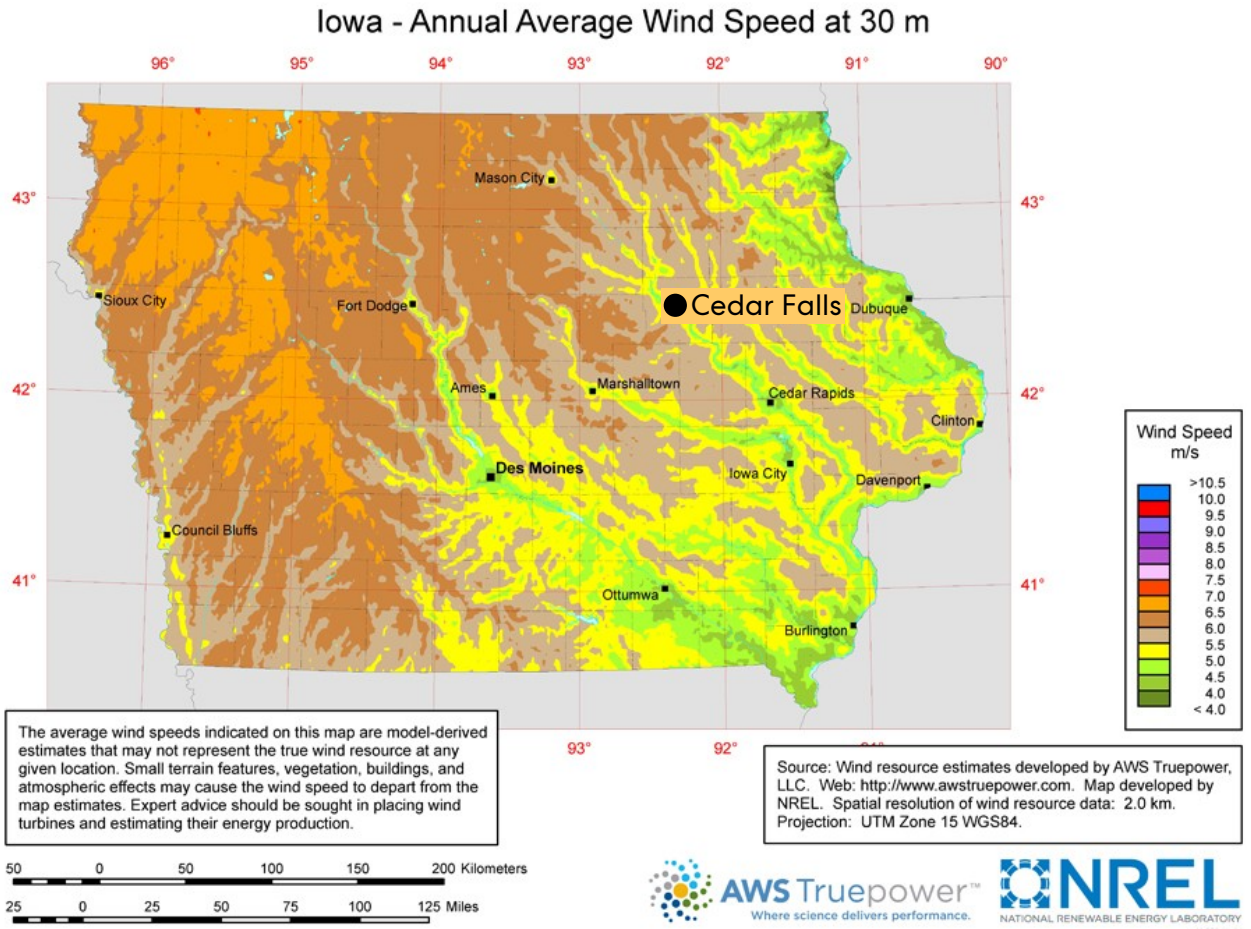
Access to energy is essential to Cedar Falls. Cedar Falls Utilities provides low-cost, reliable electricity and natural gas for the community and the University of Northern Iowa. A long-term energy goal for Cedar Falls Utilities is to maintain a competitive cost structure and energy effectiveness. Renewable wind and solar energy have rapidly become cost-effective forms of electricity generation in Iowa and the Upper Midwest.

Their cost-effectiveness is due to a decade-long drop in the built cost of solar and wind, and to the abundance of wind resources in Iowa. As a result, coal and natural gas-powered electric generation is becoming substantially less competitive.

An example: Great River Energy Co-op has announced that it will be closing its North Dakota, 1.2 Gigawatt Coal Creek Station generating plant in 2022 because it is no longer economically feasible to run. The power plant has immediate access to a coal mine, yet they will be replacing the plant's production with wind power and battery storage.

Wind power has become the lowest-cost energy source over the past decade, followed by Solar Photovoltaic (PV) electricity based on a Levelized Cost of Energy basis (LCOE).[1] LCOE is the cost of electricity generation for a generating plant over its lifetime, including building, operating, and decommissioning the plant. Building new solar generation now costs about the same as the operating costs for existing coal electricity generation.[1]

Figure 32. Available Wind Resources for Iowa



1 Lazard, October 2020
https://www.lazard.com/media/451419/lazards-levelized-cost-of-energy-version-140.pdf

Energy & Mobility *continued*

Low-Cost Electricity and Fuel *continued*

All types of energy commonly receive subsidies.[1] The switch from fossil fuels or nuclear power-generated electricity towards wind and solar PV-generated electricity is currently being driven in-part by substantial reductions in their cost before subsidies. The electricity grid is shifting toward renewable sources. The next step in energy innovation is in wind and solar PV energy storage. Battery and hydrogen technologies for energy storage are maturing rapidly, along with micro-grid technologies used to support the dispersed generation of solar power.

2020 Levelized Cost ($/MWh) of Electricity – Unsubsidized:[2]

• Onshore Wind (Rural)	$26-$54
• Utility Scale Solar PV (Crystalline)	$31-$42
• Gas Combined Cycle	$44-$73
• Coal	$65-$159
• Nuclear	$129-$198
• Gas Peaking Plant	$151-$198

Liquid and Gas Fuels

Current and foreseeable technologies limit the potential to produce renewable forms of liquid and gas fuels such as biomethane or hydrogen in quantities adequate to completely replace fossil fuel-based natural gas, petroleum and diesel. The production of renewable liquid and gas fuels typically requires considerable quantities of biomass, water, or both. Biomass and water are more limited in supply than sun and wind for energy conversion. Nuclear power can be used to produce hydrogen as a fuel, but it produces long-lived radioactive waste that has proven to have long-term storage challenges.

As a result, eliminating all use of liquid and gas fuels such as natural gas over the next 30 years is not considered feasible at this time.

Demand reduction for natural gas and other liquid fuels should be pursued through efficiency and voluntary conversion to renewable electricity followed by direct replacement of non-renewable liquid and gas fuels with renewable versions including biodiesel, biomethane and blends of biomethane and hydrogen. Polished or scrubbed biomethane can directly replace fossil based natural gas and biomethane/hydrogen blends look promising. Both are commonly referred to as renewable natural gas (RNG).

There is an opportunity for creating RNG using bio-reactors and biomass from native grasses. The grasses can provide buffer strips for water pollution control from run-off into streams and rivers and provide habitat for wildlife. Switchgrass is native to Iowa and is one of several feedstock options for using locally grown and harvested biomass. RNG could make natural gas a locally produced energy product instead of importing it from outside the region.

Voluntary conversion from natural gas to electricity for heating requires improvements to the regional and local power grid as electricity demand increases. As the market shifts towards renewable electricity, incrementally increasing the capacity of the citywide electric grid will allow for expanded use of electricity for transportation and heating of homes and buildings.

Micro-grid technology, local solar PV, and battery storage systems are an opportunity for reducing demand on the power grid. This can free-up grid capacity for increased electrification. Examples include shifting heating equipment from natural gas boilers to electric heat pumps. Just as Cedar Falls is a regional leader in internet access and technologies, it could be a regional leader creating high-skill service jobs in resilient technologies using these innovative technologies. Those technical services could be exported to other communities around Cedar Falls, Iowa, and the region. Micro-grid technologies can also be used for distributed solar PV for improved extreme wind, ice, and weather resilience.

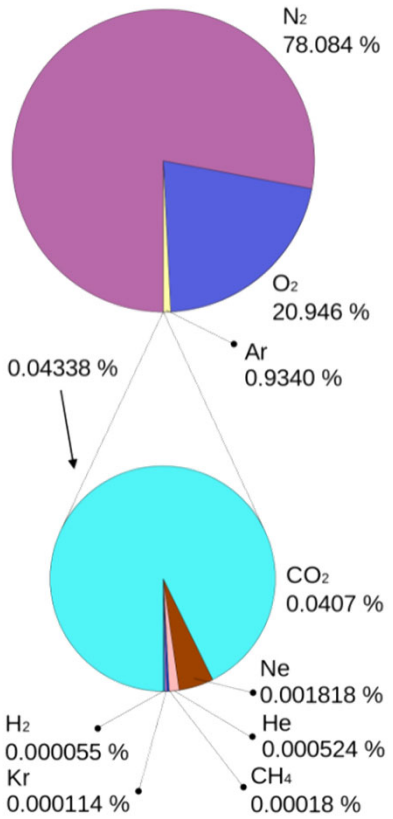
[1] U.S. Energy Information Administration, April 2018
https://www.eia.gov/analysis/requests/subsidy/

[2] Lazard, October 2020
https://www.lazard.com/media/451419/lazards-levelized-cost-of-energy-version-140.pdf

Energy & Mobility *continued*

Figure 33. What's in the Air?

Non-heating trapping components comprise 99.5% of dry air (top pie chart)



Heating trapping components comprise less than ½ of 1% of dry air (bottom pie chart)

Graph:
NASA Jet Propulsion Lab 2019
https://go.nasa.gov/2RKIJ3H

Another emerging technology and opportunity is the use of wind power to generate hydrogen as a form of energy storage for renewable energy along with batteries. The wind electricity to hydrogen conversion is still relatively young, but it is maturing rapidly and may prove to be a breakthrough technology. Northeast Iowa is in an excellent position to be become a leader in this technology sector.

Effectiveness

When asked their opinion on the reliability of renewable energy coupled with battery storage, about 40% of the Resilience Plan Worksheet Three participants considered renewable energy a reliable energy source; about 20% said maybe, and about 25% said no, it wasn't a reliable source. The worksheet was available shortly after the 2021 Texas power outage. During the 2021 Texas power outage coal, natural gas, and wind power experienced significant shortfalls in performance resulting from a lack of preparedness for regionally extreme cold temperatures.

Wind power can be, and is effective, even in cold weather. In regions such as the upper-Midwest, wind turbines are commonly engineered to operate down to temperatures near (-)20 degrees Fahrenheit (20 degrees below zero) where they automatically shut-down.[2] Fossil fuel energy systems using natural gas and coal can also experience forced shut-downs due to the effects of extreme cold temperatures.[2]

A step-by-step approach to implementing renewable energy technologies can allow them to be thoughtfully and seamlessly integrated into the grid while bringing leading technologies and the new jobs that come with that technology to Cedar Falls. Emerging storage technologies for renewable energy are falling in price. Those technologies are expected to expand the potential for renewable energy to be the primary source of energy in the coming decades.

Pollution Reductions

Low-cost energy availability and job creation are not the only reason to switch to renewable energy. They are also much cleaner to operate than fossil fuels. Fossil fuels and nuclear power both result in substantial quantities of high-impact pollution. Nuclear power generates long-lived radioactive waste that has no viable disposal solution to date. Burning fossil fuels emits multiple pollutants including Carbon Dioxide (CO2). CO2 is a powerful heat-trapping gas. As shown by NASA Figure 33, less than 1/2 of 1 percent of the gas in the earth's air traps heat.

Due to CO2's potency, increases in this heat-trapping gas and other gases like it has a notable impact on the temperature and weather. This is because the sun's heat energy stays fairly constant, but the additional heat-trapping gases trap more of that heat resulting in increasing air and land temperatures.

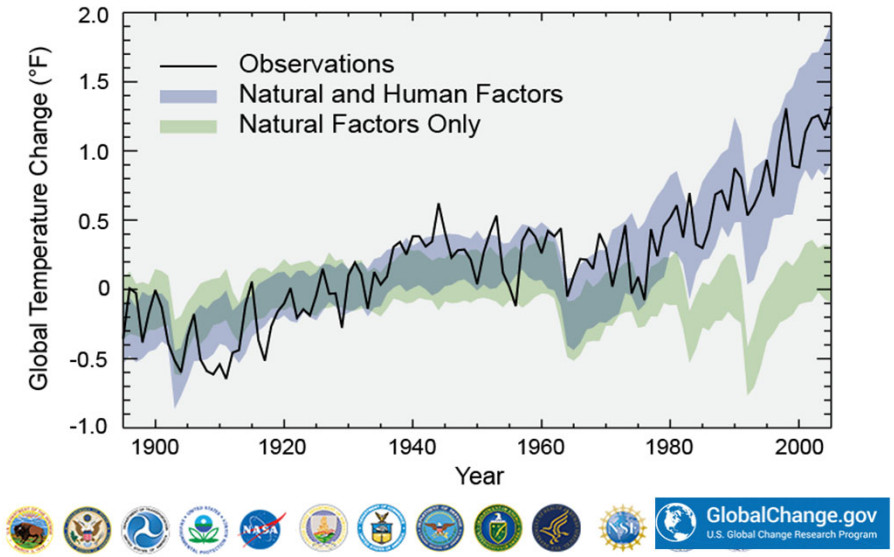
[2]Energy News Network – Wind turbine shutdowns during polar vortex stoke Midwest Debate
https://energynews.us/2019/02/27/wind-turbine-shutdowns-during-polar-vortex-stoke-midwest-debate/

Energy & Mobility *continued*

Burning large quantities of fossil fuels to power the modern world has resulted in a fast increase of CO2 in the atmosphere. The added CO2 is trapping increasing levels of heat energy from the sun that would otherwise escape into outer-space. This is causing temperatures in Iowa and world-wide to shift, and that is causing a change in the weather. In particular, it is resulting in warmer temperatures and those warmer temperatures are resulting in more extreme storm and torrential rain events across the nation, and in the Cedar Falls region (see Weather & Nature).

Figure 34. shows how temperatures would have changed due to only natural factors and how temperatures have changed due to the added CO2 and other heat-trapping pollutants in the atmosphere.

Figure 34. Separating Natural and Human Impacts on Temperature



A speedy transition to carbon neutral electricity and continued improvements in energy efficiency are essential from a pollution reduction standpoint. While the market is trending towards carbon neutral renewable electricity production, the market uptake of storage will need to be encouraged to keep the transition moving quickly.

Moving from fossil fuel-based liquid and gas fuels towards electricity in a timely way will require persistence and active engagement to facilitate the transition. The Cedar Falls community can effectively support this transition while creating high-skill jobs growing the Cedar Falls economy. Support for carbon neutral energy will also send a signal to local, regional, and national business talent and entrepreneurs that the Cedar Falls community is ready for business today and prepared to embrace the companies and technologies of the future.

Managing carbon pollution can improve the local economy of Cedar Falls and is essential for reducing future weather extremes driven by the warming temperatures caused primarily by heat-trapping pollution like CO2. The following section outlines a scenario reducing carbon pollution based on the opportunities like those discussed above and the assumptions and the possibilities below in the next section.

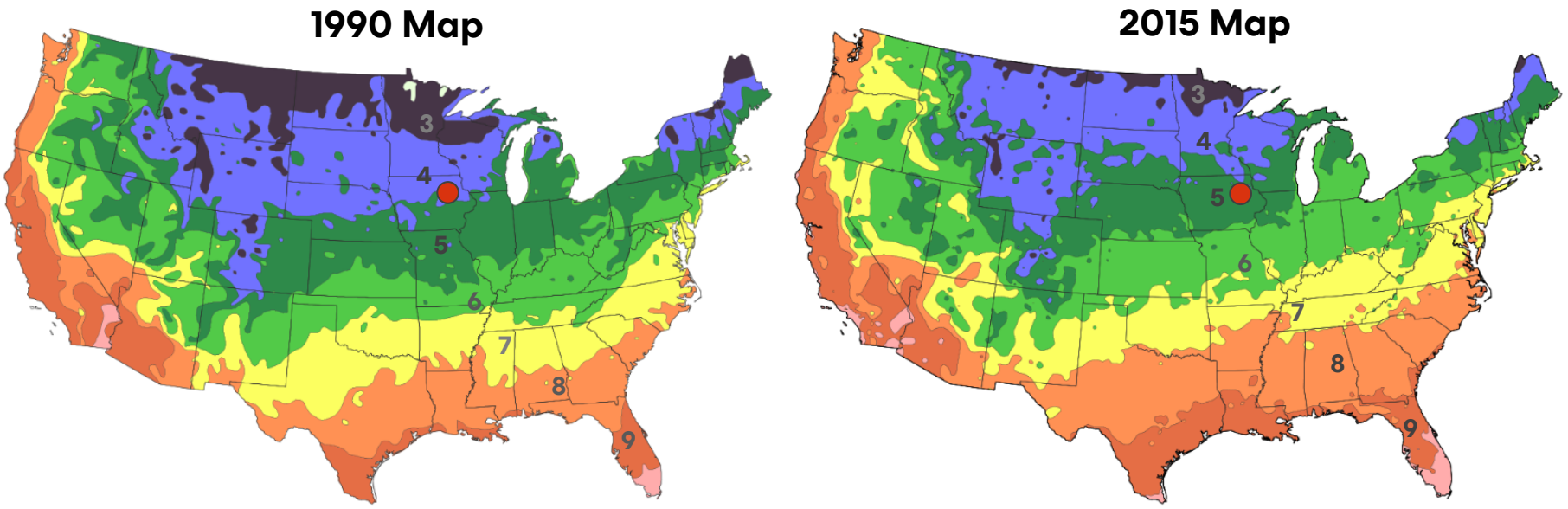
Carbon Pollution Reduction Scenario & Assumptions

Communitywide Carbon Reduction Goal: Carbon Neutral by 2050 for Electricity and Natural Gas

Communitywide 2050 Carbon Neutral commitments for CFU to provide Electricity and Natural Gas were established through the planning process and included in the Action Sets. A carbon pollution reduction scenario was developed to support that commitment. CFU's strategy to reach the 2050 carbon neutral goals will adapt based on future economics and evolving energy technology. Those 2050 carbon neutral commitment assumptions are included below, along with opportunities for the community to support those assumptions.

Energy & Mobility *continued*

Figure 35. Plant Hardiness Zone Temperature Shift



1990 USA Plant Hardiness Zone Map
Data source: USDA

2015 USA Plant Hardiness Zone Map
Data source: NOAA

Base maps available from the Arbor Day Foundation: https://www.arborday.org/media/highresolution.cfm. Map text style and graphics modified for size and inclusion of zone labels and Cedar Falls location. Arbor Day Foundation information on the 2015 Hardiness Zone Map: https://arbordayblog.org/treeplanting/our-hardiness-zone-map-gets-a-refresh/
For more detailed information, USDA Plant Hardiness Zone Map can be referenced at: https://planthardiness.ars.usda.gov/

The Arbor Day Foundation Plant Hardiness Zone base maps above are designed for comparing past and current zones. The graphic style and use of full hardiness zones (not half-zones) make the maps readable at a small size that fits one page and is easier to compare for a wide audience.

Hardiness Zones have shifted in many areas. Per the USDA, the shift is generally one half-zone warmer since 1990 (about 5 degrees Fahrenheit). Hardiness Zones represent the average annual extreme minimum temperatures at a given location during a particular time period based on historical records (USDA). USDA zone maps from 1960 (full-zone), 1990 and 2012 (half-zone) can be found at: https://www.ars.usda.gov/oc/br/zonemap/zonemap/.

Energy & Mobility *continued*

Carbon Pollution Reduction Scenarios *continued*

Energy Use Assumption Metrics for the Carbon Reduction Scenario
(based on historical Cedar Falls data)

Voluntary Energy Use Reduction Assumption Metrics for Existing & New Homes
Base: 2030 5%, 2040 7%, 2050 8%
Advanced: 10%, 15%, 20% respectively

Voluntary Energy Use Reduction Assumption Metrics for Existing & New Commercial Buildings
Base: 2030 5%, 2040 7%, 2050 9%
Advanced: 10%, 15%, 20% respectively

Voluntary Energy Use Reduction Assumption Metrics for Existing & New Industrial Facilities:
New and Existing: 2030 5%, 2040 7%, 2050 9%

Expand Customer-owned Renewable Generation Assumptions Metrics : 2030-1.8 MW, 2040-2.9 MW, 2050-4.1 MW.

Voluntary reductions in carbon pollution from heating energy and natural gas use assumption Metrics (all use):
33% reduction in carbon pollution: 2040
66% reduction in carbon pollution: 2045
100%: 2050

Communitywide Waste and Landfill Reduction

Incremental advancement towards Zero Waste by 2070.
Waste Reduction Assumption Metrics:
2030 2%, 2040 9%, 2050 18%
Recycling Rate Assumption Metrics:
2030 44%, 2040 72%, 2050 94%

Opportunities for achieving Carbon Pollution Reduction Scenario

Along with the opportunities identified previously, the following possibilities exist in the community for supporting the assumptions in the Cedar Falls Carbon Pollution Reduction Scenario. These opportunities go hand in hand with the Actions in the Energy and Mobility category Action List.

Community Opportunities

Local Jobs and Economy

Energy efficiency upgrades to homes, residential buildings, commercial buildings, and industrial facilities generate jobs and business opportunities while reducing pollution, saving money, and improving comfort.

Energy efficiency is essential for providing more local power grid capacity. When facilities are more efficient, the available grid can serve more facilities.

A future opportunity to help the community activate energy efficiency job and business opportunities includes bi-annually summarizing & reporting on carbon pollution reductions and cost savings to inspire others in the community to take action. Breaking out the report by residential, commercial and industrial reductions will help those economic sectors see and understand the economic benefits related to their businesses.

Residential buildings and Home Opportunities

Continue energy audits for homes as identified in the Energy and Mobility Action List of the plan. If appropriate, include do-it-yourself efficiency items like weatherstripping and references to local contractors with good reputations capable of doing the work in audit results. Do-it-yourself opportunities are particularly

Energy & Mobility *continued*

What you can do as a homeowner, individual, or residential property owner:

Contact Cedar Falls Utilities and request an energy audit.

Install LED Lighting (see CFU's rebate program)

Install ceiling fans to improve thermal comfort and avoid air conditioning or for moving warm air collected at the ceiling level to a level lower in the room.

Weather strip doors and windows.

Add attic insulation. It is generally easier to do than walls and can have a big impact.

Hot Water Efficiency can be low cost and can save money on energy bills. To do that:

- Insulate your water heater with an approved insulating jacket.
- Install water efficient faucet aerators (1 or 1.25 GPM for residential faucets and 1.25 or 1.5 GPM showerheads).

Install water efficient toilets (1 gallon per flush are readily available). This won't save you energy, but it will save you water. The energy to process, sanitize and pump water used in homes and buildings will be reduced.

If you are installing **a new heating and cooling system** or replacing your old one, consider high efficiency equipment and / or an air exchanger. Electrify your heating with efficient geothermal.

In non-critical light areas, install occupancy sensors, so lights automatically turn off or dim in unoccupied rooms. Screw-in occupancy sensors are available.

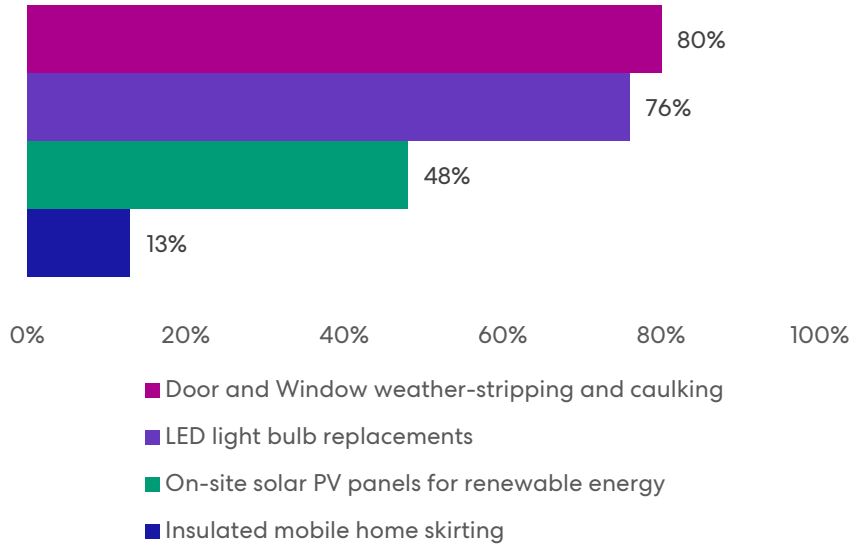
Make sure unneeded lights are turned off.

Consider solar hot water for multi-residence buildings with high demand peak loads for showers.

useful for lower-income residents that may benefit the most economically from improved efficiency. The percent of income spent on energy for lower-income families can be 3 to 10 times more than for residents with medium or upper incomes. Support the audits with coordination for available grants through state or federal agencies or low-cost loans made available through local lenders to improve implementation.

Figure 36.
Interest in Home & Commercial Property Energy Improvements Responses from Resilience Plan Worksheet 3 participants

Worksheet Three Query: *"Would you be interested in voluntarily implementing some or all of the following strategies at your home or commercial property? If so please select those that you find of interest."*



Energy & Mobility *continued*

Commercial Energy Efficiency

One commercial building opportunity to inspire building owners and managers to improve energy efficiency is to start and publish a voluntary building energy benchmarking program. It could eventually convert to a mandatory program. This will motivate building owners and operators to invest in their properties to make them more efficient and more valuable.

Future opportunities include expanding on the current energy efficiency programs for existing City of Cedar Falls facilities by pursuing Net Zero Energy or Net Positive Energy for Cedar Falls facilities that may be built or receiving a renovated in the future.

Energy demand reductions recommended for new or significantly renovated facilities constructed between now and 2040: 25%, after 2040: 40%, after 2050: 60% than 2020. Consider coupling on-site renewable energy generation with battery storage and making it an "island" or stand-alone to power critical operations in energy emergencies. Don't try to power the entire facility. Instead, pick out the things that really matter if the power goes out during an extreme event.

City and public facility energy updates and engineering improvements can act as catalysts for action by others in the community. One opportunity available is to track and bi-annually publish the energy savings. Creating simple how-to case studies showing the techniques, products, and people involved can help others understand how to make their facilities more energy efficient.

What you can do as a commercial building owner, operator, or tenant – Heating and Cooling Energy:

Make sure that heating and cooling equipment is serviced

Change air filters regularly to reduce friction in airflow

Set back thermostats at night and on-off hours.

Install a building wide automated control system that manages specific heating and cooling zones based on their occupancy and operating times . The system should turn the temperature settings up or down 24 hours a day, 365 days a year.

Where appropriate, install Variable Frequency Drives (electric motors).

What you can do as a commercial building owner, operator, or tenant:

Contact Cedar Falls Utilities about a possible energy audit or custom energy modeling for your building.

Reduce Lighting energy

Install LED lighting fixtures or replace old bulbs, including linear fluorescent bulbs with LED retro-fits.

If the lighting is within 2 1/2 or 3 times the head height of a window, include self-regulating dimmers that gradually turn the light level up and down with varying levels of sunlight.

Ensure lights are turned off at night and during off hours. If possible, use an automated lighting control system with occupant override switches.

In non-critical light areas such as offices, break rooms, toilet rooms, and storage rooms, install occupancy sensors, so room lights automatically turn off or dim in unoccupied areas.

Energy & Mobility *continued*

Industrial Energy Efficiency

Industrial facilities are an important Energy Efficiency opportunity to pursue as energy used to conduct the industrial process can be significant. Continue the pursuit of energy use reductions and renewable energy for manufacturing processes with customized audits and analysis. Equipment loads and process loads can be significant and often require custom solutions.

Carbon Neutral Energy Opportunities

One opportunity available in Cedar Falls for supporting a 100% carbon neutral energy power grid is to provide intermittent power for wind and solar by retooling the Streeter Station as a peaking plant for electric power generation from renewable natural gas.

Customer-Owned solar can be part of a larger network of utility owned distributed solar energy to support grid resilience.

Incrementally increase the capacity of the city wide electric grid allowing for expanded use of electricity for transportation and heating through improved transmission and distributed solar generation across the community. There is greater overall potential to produce carbon neutral electricity than carbon neutral forms of liquid & gas fuels, which are commonly burned for heat & transportation. Expanding the electricity grid capacity allows for a incremental switch from burning fuels for heat to electricity.

Mobility

Automobile makers around the world are rapidly shifting toward electric vehicles. A 2019 Consumer Reports survey found that nationally 63% of prospective car buyers in America have some interest in electric vehicles (EV's) and 31% would consider one for their next purchase. This is line with a Cedar Falls survey that showed 25% of respondents are interested in EV's. Currently electric hybrids make the most sense in Cedar Fall's urban and rural setting. The city has started converting to electric and hybrid light-duty vehicles. Electric and hybrid medium and heavy duty vehicles are currently available for city buses, fire trucks (Madison, WI) and some other equipment.

What you can do as an industrial facility owner or operator:

Contact Cedar Falls Utilities about a possible energy audit or custom energy modeling for your facility

Heating and cooling energy:
Explore solar hot water for food processing, laundromatts, residential facilities & other peak load intensive hot water uses.

Explore displacement ventilation for air quality and efficiency. It may reduce the demand for very high volume fresh air criteria.

Energy & Mobility *continued*

Mobility *continued*

As called for in the Action Sets, incrementally continue to convert City and Cedar Falls Utility fleet to hybrid or electric vehicles as light-duty vehicles are retired. Convert medium and heavy-duty fleet vehicles when technically feasible as they are retired.

Hybrid Rideshare Co-op

An opportunity to expand mobility options in Cedar Falls exists by completing the bike trail and commuter bike routes in Cedar Falls. The existing Cedar Falls bike trail system is robust. It offers the opportunity to improve mobility options for individuals in the community if loops and dead ends are completed and gaps filled.

A local electric hybrid vehicle rideshare co-op with commuter bike racks can help complete the bike trail and route systems as an alternative mobility choice for the Cedar Falls community. Bike commuters can count on a ride to a meeting from work, get a ride during expected inclement weather or a late night at the office.

The rideshare co-op could provide subscription service for seniors and the disabled. Unsubscribed time can be used for on-demand service to anyone. Requiring bike racks on all rideshare cars will be important for ensuring they complement the bike system. The Resilience Coordinator can help co-op owner-drivers find grants or low-cost loans to purchase vehicles and install commuter bike racks on their cars.

On-demand audiences for a rideshare include University of Northern Iowa students, 'first and last mile' riders for the Cedar Falls bus route and bike commuters. To succeed, regular operating hours, including early & late times, will be needed. This program can generate local jobs. The co-op should target a living and family wage for drivers.

Along with a hybrid rideshare co-op, consider promoting the voluntary use of hybrid and EVs by incrementally expanding access to charging stations in Cedar Falls at a rate that modestly exceeds the anticipated increase in market demand. Another opportunity available is to provide parking stalls at various locations for rentable plug-in hybrid rideshare vehicles. While chargers are preferred at these locations, they are not required. Plug-in hybrid cars are desirable over all electric vehicles for rental due to the urban and rural driving distances in Cedar Falls.

A local rideshare program would be innovative. However, it could be an important complement to the commuter bike trail and route system making them a viable mobility and commuter option.

Here are two examples of rideshare co-ops that accept existing drivers and services. One in New York, and one national.

Examples of rideshare co-ops:

Local Driver - National
https://localdriver.co/membership/

The Drivers Cooperative – New York
https://www.drivers.coop/

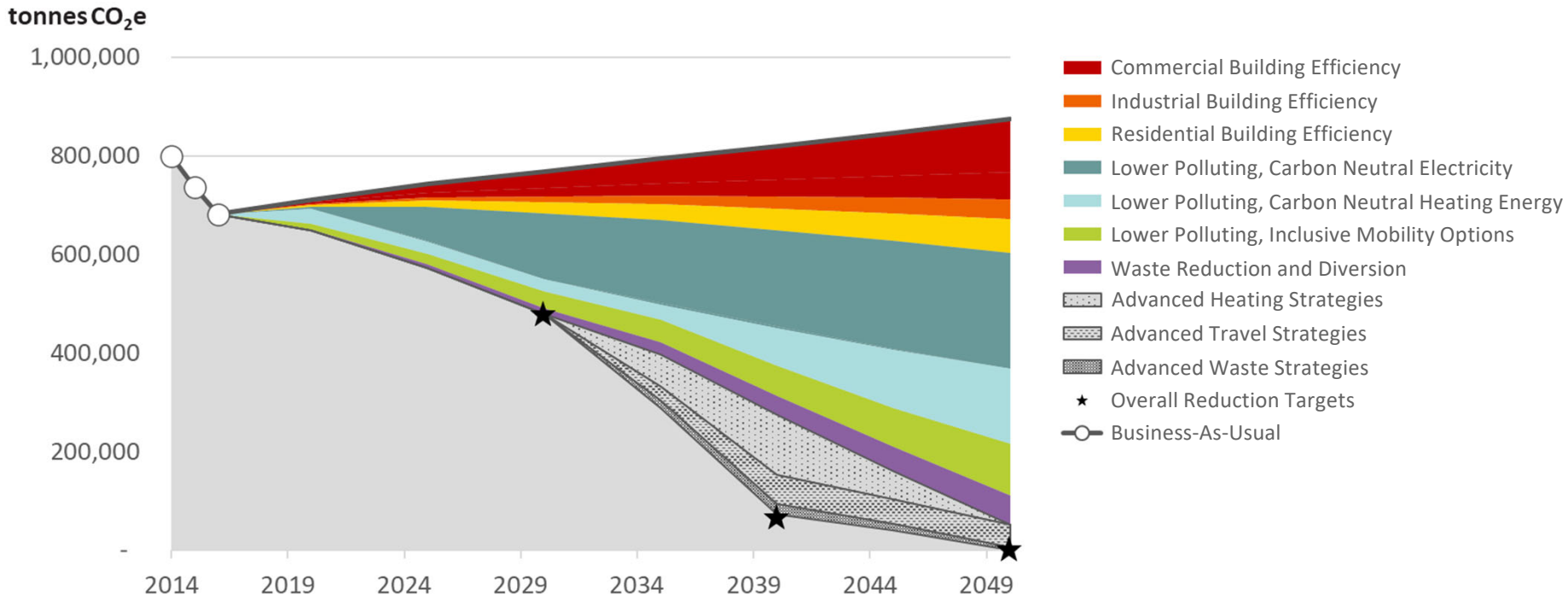
Energy & Mobility *continued*

Carbon Reduction Scenario

Cedar Falls has developed a scenario outlining different strategies to reduce carbon pollution between now and 2050 (Figure 37). This scenario includes baseline data from 2014-2016, a "business-as-usual" trajectory through 2050, overall reduction assumptions for 2030, 2040, and 2050, and a series of reduction "wedges". "Starred" overall reduction targets are approximate.

Assumption for nine areas of carbon reduction were established that require participation from the entire community. The assumption metrics were listed previously in the plan, along with techniques, strategies and opportunities for achieving the metrics. Added information on the assumptions are included in the Appendix and narrative. High-priority items, recommendations and specific goals are identified in the Action Sets. Advanced strategies that show strong promise but require technologies and markets to develop further before pursuing do not have specific Action Sets. However, they are discussed throughout the Energy & Mobility narrative and in the Appendix.

Figure 37. Carbon Reduction Scenario



Energy & Mobility *continued*

Carbon Reduction Scenario
continued

The baseline data reflects the results from the community-wide carbon pollution inventory, including emissions from activities occurring within the community such as building energy use, vehicle travel, and waste generation. The business-as-usual trajectory represents what could happen if the community grows in population as predicted while continuing to emit carbon at the same rates as in 2016.

The overall reduction assumptions were established by the Cedar Falls resilience planning team to guide this exercise. The 2030 assumption was created based on established technologies and reduction techniques to be both meaningful and achievable.

The 2040 and 2050 assumptions are based on per capita carbon budgets calculated using the goals established by an international organization of scientists representing 195 member countries (including the United States) through an open and transparent review of the thousands of scientific papers published each year on the topic (IPCC 1.5 Report). The overall reduction assumptions for Cedar Falls equate to a 35% reduction from 2015 levels by 2030, a 90% reduction by 2040, and net-zero carbon by 2050.

The reduction wedges represent a series of carbon pollution reduction strategies intended to close the gap between the business-as-usual trajectory and the overall reduction assumptions. The wedges account for:

- Existing policies, such as building energy codes and federal vehicle fuel economy standards;
- Established goals, such as Cedar Falls Utilities goals to reduce their carbon emissions 45% from 2010 levels by 2030 and achieve carbon-neutral electricity generation by 2050;
- Anticipated market trends, such as an increase in electric vehicles; and
- Potential reduction strategies developed through the resilience planning effort, such as producing renewable natural gas and diverting waste from the landfill. These strategies are reflected in the action sets for the community laid out in this plan.

Assumptions and context for each of the strategies included in this scenario are presented in the Appendix. While established technologies and reduction techniques are anticipated to make significant progress toward these long-term goals in Cedar Falls, the final portion - represented by the "Advanced Strategies" – depends on emerging technologies and techniques, likely including a combination of additional carbon pollution reduction plus carbon removal from the atmosphere and sequestration.

Carbon Reduction Scenario Wedge Action Sets

- Action Set A1: Residential Building Efficiency
- Action Set A2: Commercial & Industrial Facilities Efficiency
- Action Set A3: Lower-Polluting, Carbon Neutral Electricity
- Action Set A4: Lower-Polluting, Carbon Neutral Heating Energy
- Action Set A5: Lower-Polluting, Inclusive Mobility Options
- Action Set A6: Waste Reduction and Diversion

Energy & Mobility *continued*

Cedar Falls Carbon Pollution Inventory

Students at the University of Northern Iowa conducted a three-year carbon pollution inventory for the community of Cedar Falls following the U.S. Community Protocol (USCP), developed by ICLEI Local Governments for Sustainability USA. This inventory accounts for the carbon dioxide, methane, and nitrous oxide emissions (reported in the common units of carbon dioxide equivalents, or CO2e) caused by activities occurring within the community, including:

- use of electricity by the community
- Use of fuel in residential, commercial, and industrial stationary combustion equipment (engines, boilers, heat-based factory processes)
- On-road passenger and freight motor vehicle travel
- Use of energy in potable water and wastewater treatment and distribution
- Generation and disposal of solid waste by the community

Data for the carbon pollution inventory comes from a variety of sources, including aggregated

Figure 38. Cedar Falls 2016 COe Breakdown.

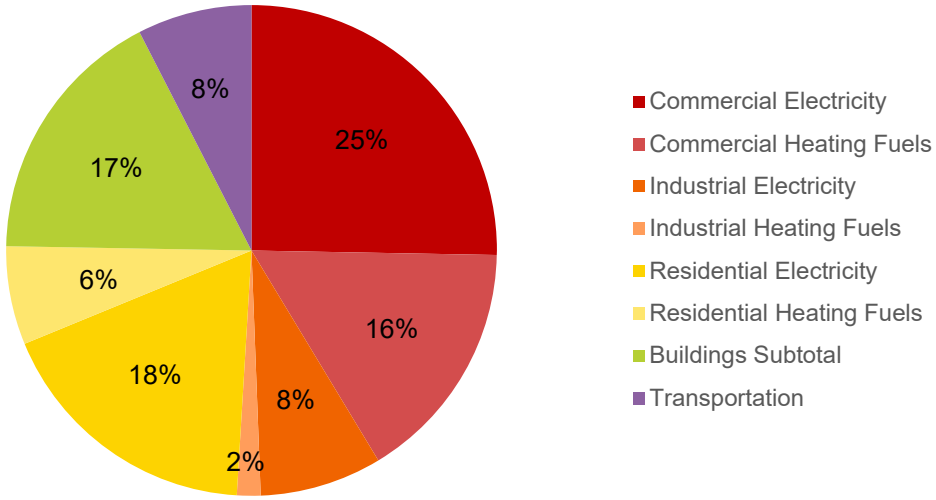
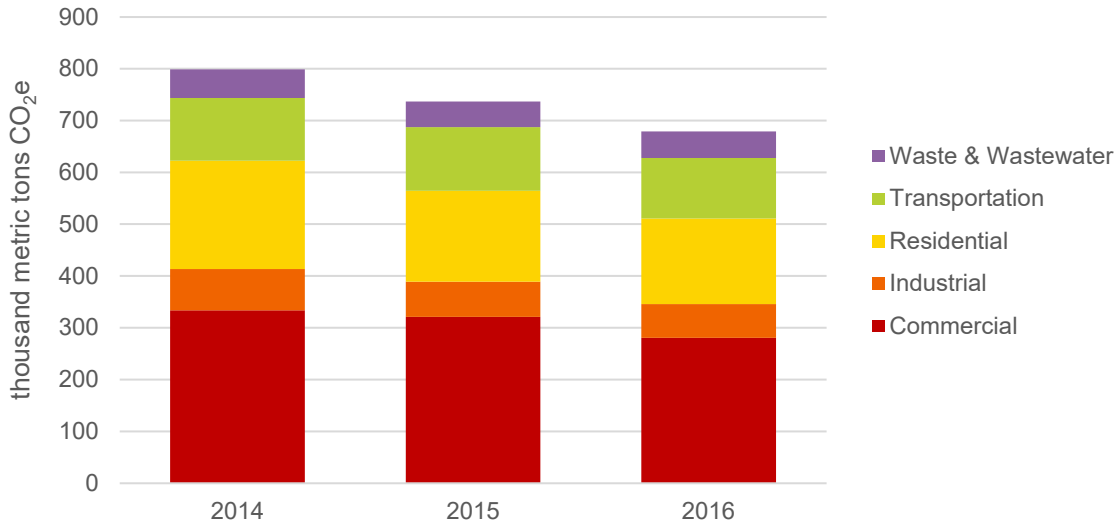


Figure 39. Cedar Falls 2014-2016 COe émissions trends



Energy & Mobility *continued*

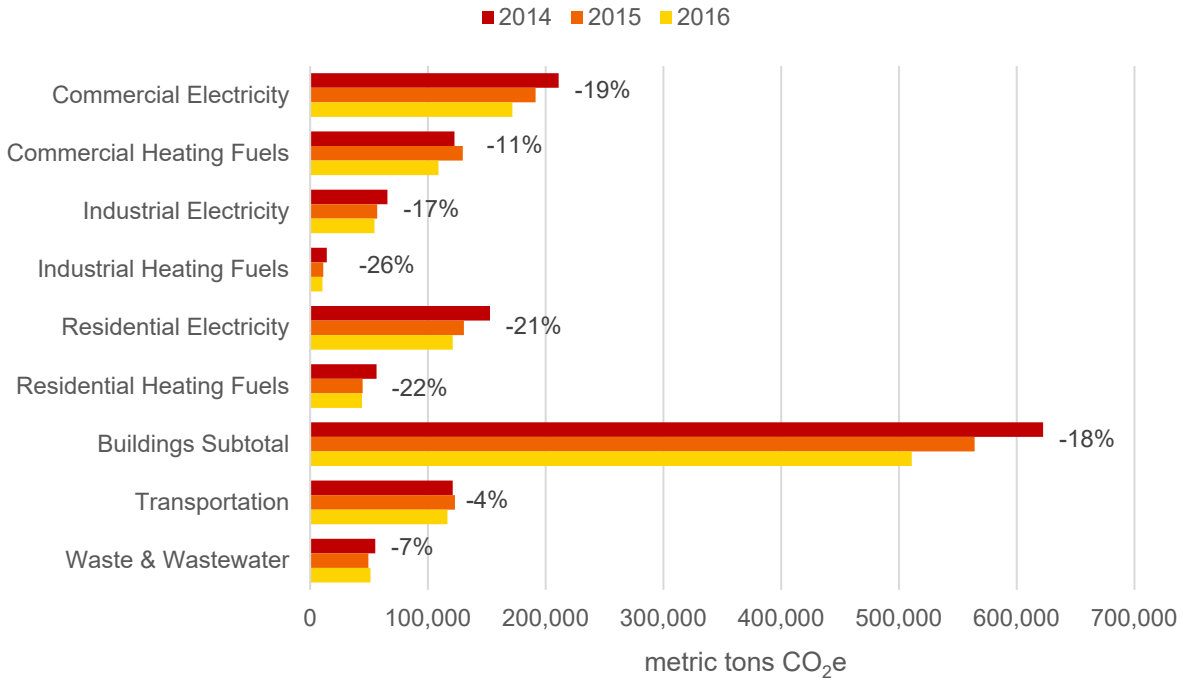
Carbon Inventory *continued*

energy data from Cedar Falls Utilities, vehicle travel data from the Iowa Department of Transportation (DOT), and waste data from the City of Cedar Falls and Black Hawk County.

In 2016, the community of Cedar Falls emitted 679,000 metric tons of CO2e. Approximately 75% of these emissions came from the energy used in buildings, while 17% came from transportation and the remaining 8% from waste and wastewater management (Figure 39). Within the building sector, 68% of emissions were from electricity while 32% came from natural gas and other heating fuels. Commercial buildings accounted for 55% of building energy emissions, with residential accounting for 32% and industrial accounting for 13%.

Community-wide emissions decreased by 15% from 2014 to 2016, primarily due to warmer winters and a transition to cleaner electricity sources (Figure 38 and Figure 39).

Figure 40. Cedar Falls 2014-2016 CO2e emissions trends by sector/energy type



Building Energy Use

Despite the majority of 2016 building energy emissions coming from electricity, the majority (59%) of building energy use is from heating fuels. This demonstrates that electricity emissions per Million British Thermal Units (MMBtus) were considerably higher than natural gas emissions rates in 2016. However, Cedar Falls Utilities electricity emission rates have dropped since 2016 and are anticipated to continue dropping as they strive to meet their carbon goals.

Energy & Mobility *continued*

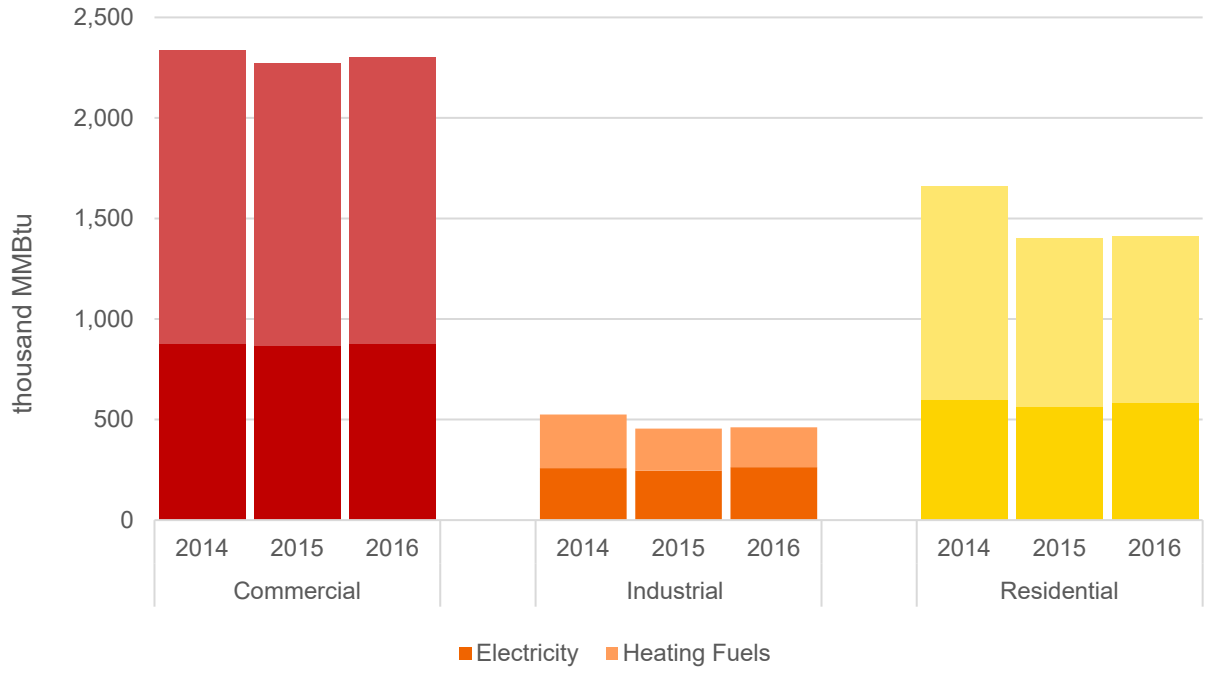
Building *continued*

The use of heating fuels in buildings decreased by 12% from 2014 to 2016 – primarily in the residential sector – likely due to warmer winter temperatures (Figure 41). Electricity use stayed relatively constant, though cleaner generation sources led to an overall reduction in electricity emissions.

Residential energy use can also be viewed in terms of its economic burden on households. The term "energy burden" refers to the cost a household pays in energy bills as a percentage of total household income. The average energy burden in the U.S. is 3%; 6% is considered a "high energy burden" and 10% a "severe energy burden".

The average Cedar Falls household spends 2% of income on energy (Figure 42). However, low-income households spend 20%, equating to nearly $2,000 of annual energy costs – more than any other group. Reducing the severe energy burden for these households represents a key opportunity to address carbon pollution, resilience, and social equity.

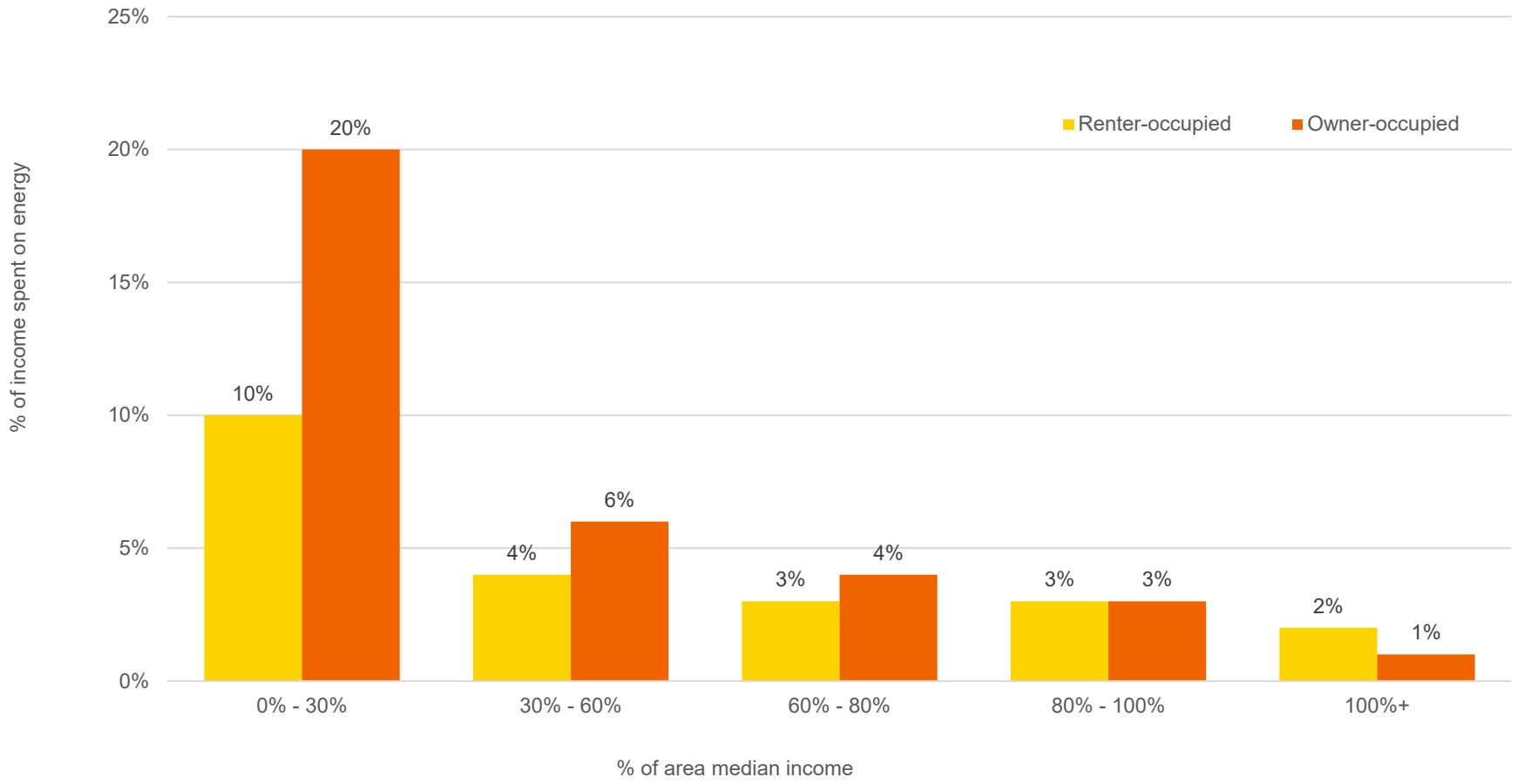
Figure 41. Cedar Falls Energy Use by Sector and Energy Type



Energy & Mobility *continued*

Building *continued*

Figure 42. Cedar Falls Household Energy Burden by Tenure and Income



Energy & Mobility *continued*

Transportation and Mobility

The most common form of transportation in Cedar Falls is single-occupancy vehicles (Figure 43). Based on a national scoring system from Walk Score that evaluates routes to amenities, the community is "car-dependent", with an overall Walk Score of 38, Bike Score of 57, and Transit Score of 20 (on a low to high scale of 1-100).

Waste Management

Waste in Cedar Falls is managed through a combination of City staff or City-contracted haulers, private haulers, and individual drop-off at recycling locations, the compost facility, the waste transfer station, and the County landfill used by residents and businesses. Approximately 5.5-6.5 pounds of waste is landfilled daily per person living in Cedar Falls, and over three-quarters of the city-managed waste is landfilled (Figure 44).

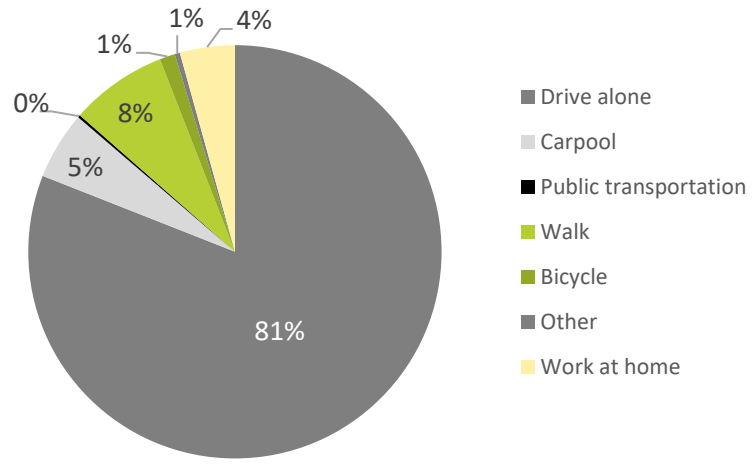
Reduction Actions:

Encourage development of the local circular economy. Promote reuse/shared use opportunities:
- Tool rental and lending library
- Product repair shops
- Resources that sell used products.

Explore a voluntary curbside composting co-op operated by local farmers for restaurants & residents. Targets:
- Feasibility Micro-Study: 2023
- Pilots Program (if feasible): 2025
- Expanded start-up (if feasible): 2027

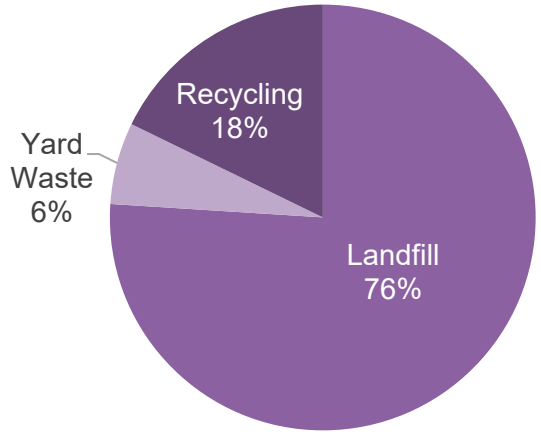
Pursue the reduction of single-use plastic by promoting voluntary use-reductions:
- Targets: 2030 15%, 2040 40%, 2050 75%

Figure 43. Cedar Falls Commuting Methods



Data Source: U.S. American Community Survey, 2018.

Figure 44. Cedar Falls Waste Disposal Methods



Data Source: City of Cedar Falls, 2020

Action Plan

Cedar Falls, Iowa
Resilience Plan

C1 Action Set
Resilience Coordinators

This Action Set establishes identifiable positions within the City and CFU to execute the Resilience Plan. The Action Set includes descriptions, responsibilities, and guidance for those positions.

C1	Actions	Local Economy & Community: Local Business and Jobs (1)	Business Talent and Local Amenitie (2)	Diversified Local Economy (3)	Fair and Equitable Opportunity (4)	Housing Options (5)	Community Well-being (6)	Weather & Nature: Extreme Weather Readiness (7)	Extreme Rain Adaptation (8)	Variation in Landscape and Habitat (9)	Energy & Mobility: Diversified Renewable Energy (10)	Pollution and Carbon Reductions (11)	Mobility, Walkability and Bikeability (12)	Champ Partners, : Champion - Individuals/Stakeholde (A)	Champion - City (B)	Champion - Cedar Falls Utilities (C)	Time line (D)	Investment (E)	Value / Payback (F)
		Plan Drivers & Co-benefits												Logistics					
C1.1	**Identify positions at the City of Cedar Falls and Cedar Falls Utilities to oversee and coordinate the Resilience Plan Actions.** Current City of Cedar Falls staff will be allocated time + resources to implement the plan. Current CFU staff supporting energy efficiency + production will also support the plan.	■			■			■			■				■		NL	T	HF
C1.2	**The coordinators will develop & facilitate a Resilience Network** that connects community members, champions, stakeholders, the City of Cedar Falls, and CFU. Resilience coordinators will work to plan and develop a network which will include a steering committee and online tools, community newsletters, media outlets, host meetings, meeting space, printed materials, etc.	■			■			■			■			■	■		NL	T	HF
C1.3	**The coordinators will help identify community champions and advocate for Resilience Plan Actions** using the Resilience Network as a resource tool. Resilience coordinators will work with community champions and City / CFU staff to make connections with talent, knowledge and resources across the community, region and beyond to execute the Resilience Plan.	■			■			■			■			■	■		NL	T	HF
C1.4	**The coordinators will monitor and track progress** across Resilience Plan Action Sets, champions, stakeholders and community members. Resilience coordinators will develop and publish status reports on plan progress at least annually. Reports will be publicly available online.	■			■			■			■			■	■		NL	T	H
C1.5	**The coordinators will help organize internal resources** at the City of Cedar Falls and work with CFU to accomplish goals. Resilience coordinators will work across departments and divisions at the City & CFU as interdisciplinary liaisons to coordinate and pool resources for executing the Resilience Plan.	■			■			■			■				■		NL	T	H

Potential Partners & Stakeholders City, CFU, Community

Legend

Time: N Near-Term M Mid-Term L Long O On-going

■ Directly Focused on this Plan Driver

Investment: T Time $ Low $$ Med. $$$ High

■ Supports this Plan Driver

Value: M Med. H High HF Foundational

■ Connects to this Plan Driver To

■ Champion ■ Support

Cedar Falls, Iowa
Resilience Plan

C2 Action Set
Key Resilience Co-benefits

This Action Set highlights critical components of the plan that work in concert together, offering multiple benefits for improving the quality of life in Cedar Falls now and in the future. The actions in this set can be viewed as high-priority, high-impact actions that the Cedar Falls community can use to leverage other plan actions.

Local Economy & Community						Weather & Nature			Energy & Mobility			Champ Partners,					
Local Business and Jobs	Business Talent and Local Amenities	Diversified Local Economy	Fair and Equitable Opportunity	Housing Options	Community Well-being	Extreme Weather Readiness	Extreme Rain Adaptation	Variation in Landscape and Habitat	Diversified Renewable Energy	Pollution and Carbon Reductions	Mobility, Walkability and Bikeability	Champion - Individuals/Stakeholders	Champion - City	Champion - Cedar Falls Utilities	Time line	Investment	Value / Payback
1	2	3	4	5	6	7	8	9	10	11	12	A	B	C	D	E	F

C2 Actions	Plan Drivers & Co-benefits	Logistics
C2.1 **Expand the local economy by encouraging businesses to provide & develop services and products supporting the Plan.** Encourage existing & new businesses to own, finance, develop, operate and provide services and materials for the housing, buildings, products, services and infrastructure identified in the Plan. Local businesses can become regional market leaders in the resilience sector. Other products and services include renewable energy installs, energy efficiency retrofits (LED lighting, weatherstripping, insulation, heating and air conditioning), electric vehicle (EVs) stations, EVs for the city & CFU fleets, native & adapted landscape plants & care, rainwater harvesting supplies, stormwater infrastructure & maintenance, privately owned rideshare vehicles & care. See C4, W2, W5, E1, E2, E3, E4, E5.		NO T HF
C2.2 **Support access to housing with zoning changes for context appropriate, economically diversified & operationally efficient housing.** Convert existing commercial corridors to walkable & bikeable mixed-use neighborhoods by adding context appropriate economically diverse housing & amenities. See C5, W2, E1, E5.		NL T$ HF
C2.3 **Support access to mobility options by implementing the Bike-Pedestrian Plan** complimented with low-polluting, locally owned & operated rideshare services and existing bus routes. Include bike racks on all rideshare vehicles as an operational requirement. Between buses with bike racks and rideshares, biking can become a viable commuting choice. As the existing bus fleet is retired, convert to EV. See W2, E5.		NM T$ HF
C2.4 **Support access to green space with Blue-green Corridors following waterways & natural areas** that also manage stormwater & provide pollinator and bird habitat. Thoughtful design & early planning can allow Blue-green storm corridors to extend throughout the city offering pocket parks and green space. See W2, W5.		NL TNQ HF

Potential Partners & Stakeholders City/CFU, Community, equipment suppliers & installers, builders, building supply stores, nurserys, financiers, auto & vehicle suppliers

Legend

Directly Focused on this Plan Driver
Supports this Plan Driver
Connects to this Plan Driver To
Champion
Support

Time: N Near-Term M Mid-Term L Long O On-going

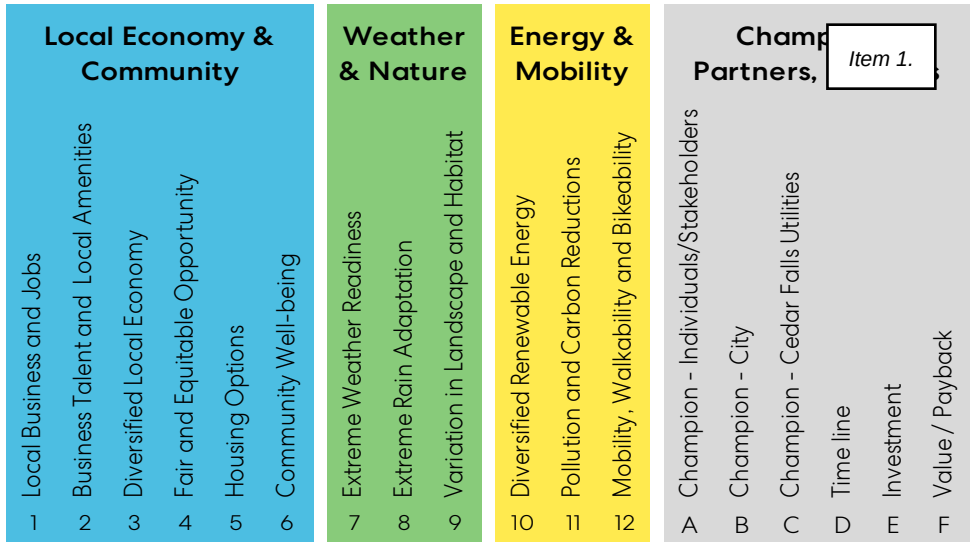
Investment: T Time $ Low $$ Med. $$$ High

Value: M Med. H High HF Foundational NQ Not Quantifiable

Cedar Falls, Iowa
Resilience Plan

C3 Action Set
Champion Cedar Falls

This Action Set highlights the importance of the community aspect of Cedar Falls. It encourages community oriented perspectives that maintain and build community scale self-reliance across a range of topics. Resilience emerges through a mix of self-reliance, codependence, and mutually beneficial relationships within and across the community, institutions, organizations, and individuals.



C3 Actions

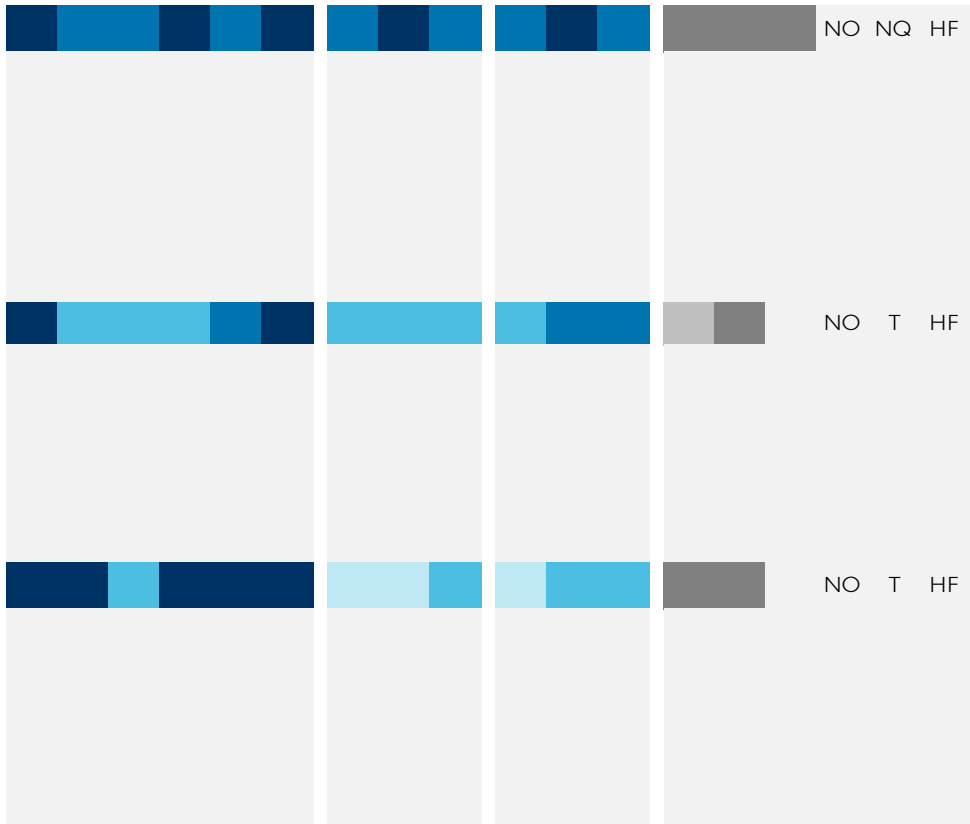
Plan Drivers & Co-benefits

Logistics

C3.1 **Actively keep Cedar Falls resilient by avoiding economic & environmental risk** associated with the loss of the community's desirability for new talent, a lack of local innovation, and extreme weather. Keep Cedar Falls vital by pro-actively addressing emergent issues pertinant to the community & by having amenities desirable to upcoming generations & talented individuals such as a vibrant downtown & mixed-use neighborhoods, modest cost housing, fast broadband, arts and culture, a bikeable city and walkable neighborhoods, environmental stewardship, access to nature, living/family wage jobs, entrepreneurial spirit and mixed cultural experiences. See C4, C5, W2, E5.

C3.2 **Continue to maintain balanced & equitable policy, code, tax and regulatory requirements** in support of a thriving & resilient Cedar Falls community, now & in the future. Balance can support community needs, and the needs of individual businesses, organizations and people. Continue the on-going, and living process of balancing individual needs and rights, with community infrastructure and environment needs, public safety, sense of place, and equitable access & fair opportunity for all. Balanced communities are more economically vibrant, socially stable, productive, and resilient.

C3.3 **Utilize the new Resilience Network to help promote fair, equitable access and opportunity for all members of the community** in support of the Cedar Falls Human Rights Commission's outreach, advocacy and education efforts. In particular, focus on coordination and connections relative to outreach and education. Through other components of this Plan, the Resilience Network can also assist the community in working to provide economically diversified accessible housing options; access to multi-modal transportation; access to a living & family income; access to green space; and access to healthy food options.



Potential Partners & Stakeholders City and Community

Legend

Time: N Near-Term M Mid-Term L Long O On-going

Directly Focused on this Plan Driver

Investment: T Time $ Low $$ Med. $$$ High

Supports this Plan Driver

Value: M Med. H High HF Foundational NQ Not Quantifiable

Connects to this Plan Driver To

Champion

Support

Cedar Falls, Iowa
Resilience Plan

C4 Action Set

Champion Cedar Falls Local Business

This Action Set identifies actionable ways in which the City and community can promote and advance the prosperity and productivity of the local Cedar Falls economy and the local community. The efforts included in this Action Set require long-term and near-term perspectives. They will require ongoing attention and action.

Local Economy & Community

1 Local Business and Jobs
2 Business Talent and Local Amenities
3 Diversified Local Economy
4 Fair and Equitable Opportunity
5 Housing Options
6 Community Well-being

Weather & Nature

7 Extreme Weather Readiness
8 Extreme Rain Adaptation
9 Variation in Landscape and Habitat

Energy & Mobility

10 Diversified Renewable Energy
11 Pollution and Carbon Reductions
12 Mobility, Walkability and Bikeability

Champ... Partners, ...

A Champion - Individuals/Stakeholders
B Champion - City
C Champion - Cedar Falls Utilities
D Time line
E Investment
F Value / Payback

C4 Actions

Plan Drivers & Co-benefits

Logistics

C4.1 **Continue to actively and persistently advance the development of amenities and businesses in Cedar Falls to attract visitors, talent and entrepreneurs.** Continue advancing Cedar Falls as a distinct multi-faceted commerce and tourism destination for the region, and as a nationally desirable location for new talent, and entrepreneurs to make Cedar Falls their home. Up and coming generations have different expectations for the places they choose compared to previous generations (see Action C3.1 for more). The difference in generational expectations can create competing interests for urban planning, city and utilities management. This plan actively seeks to creatively integrate the three together. Blue-green corridors, mixed-use opportunities, and resilient technology innovation such as micro-grids are three key examples.

C4.2 **In collaboration with other key community organizations promoting economic development, solicit local champions to develop a printed and device friendly online descriptive finder and map** for local business and organizations, public amenities, and mobility/transportation options. Develop a living story about key amenities & characteristics that make Cedar Falls desirable. Persistently tell the story through multiple perspectives and media venues. Solicit local business to participate in vigorous outreach activities and to fund development of the map.

C4.3 **Utilize the Resilience Network in support of local for profit, and non-profit business development initiatives and start-ups.** Place emphasis on those providing services and products that achieve the plan actions. See Resilience Co-benefits Action C2 for a short-list of business opportunities.

Potential Partners + Stakeholders

City and Community, Grow Cedar Valley & Mill Race,

Legend

Directly Focused on this Plan Driver
Supports this Plan Driver
Connects to this Plan Driver To
Champion
Support

Time: N Near-Term M Mid-Term L Long O On-going

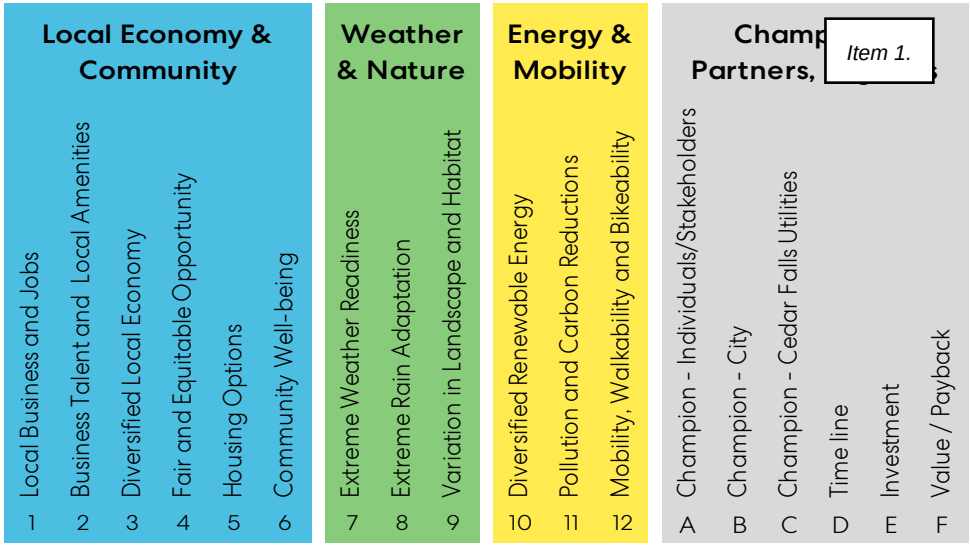
Investment: T Time $ Low $$ Med. $$$ High

Value: M Med. H High HF Foundational NQ Not Quantifiable

Cedar Falls, Iowa
Resilience Plan

C5 Action Set
Walkable Neighborhoods & Housing Options

The first intent of this Action Set is to advance neighborhood development opportunities within Cedar Falls that offer amenities attractive to up and coming generations while avoiding significant disruption to existing neighborhoods. See Figure 6. The second intent is to advance housing options that fit the economic needs of all community members and stakeholders.



C5 Actions	Plan Drivers & Co-benefits	Logistics
C5.1 **Pursue the development of walkable & bikeable mixed-use neighborhoods that encompass existing commercial corridors with bus/ bike access.** Apply a missing middle housing approach. Update zoning requirements to be contextually appropriate. Ecourage development in areas with small local grocers, banks, hardware stores, pharmacies, etc. within a 1/4 to 1/2 mile walk and within 3 miles by bike.		NL T$ HF
C5.2 **Provide the infrastructure supporting bikeability & walkability.** Include shelters, bike racks & rideshare drops-offs at bus stops. Implement the Cedar Falls bike system & nurturing a locally owned rideshare co-op (include bike racks on all vehicles) will make mixed-use neighborhoods even more appealing for bike mobility.		NM T HF
C5.3 **Encourage the development of missing middle housing options** that can provide more modestly priced housing options appropriate for their location. Missing middle housing includes townhomes, cottage court, courtyard building, duplexes side-side & stacked, tri-plexes, fourplexes, multiplex & live-work designed to fit-in with the neighborhood & compliment it (not overtaken by unit counts & building size).		NL T HF
C5.4 **Encourage distance and live/work housing with small first floor commercial uses** through appropriate zoning and building codes by encouraging small co-working centers with small food service at higher-traffic street corners through out the community. At mixed-use areas allow for combined live/work housing, commercial maker and shop space, eateries and commerce. Encourage incubator flex space, artist lofts, micro-breweries and low-polluting micro-industry. Closely consider life safety, parking & vehicle access, facility size (not too large), streetscape conditions including vehicle and pedestrian interface, window to wall size & numbers & noise		NL T$ HF
C5.5 **Encourage Accessory Dwelling Units (ADUs)** where appropriate as means of providing diversified housing options, particularly for seniors needing assistance.		NL T$ H

Potential Partners & Stakeholders City/CFU, community, equipment suppliers & installers, developers, small developers, builders, building supply stores, nurserys, financiers

Legend

Time: N Near-Term M Mid-Term L Long O On-going

Directly Focused on this Plan Driver | Supports this Plan Driver | Connects to this Plan Driver To

Investment: T Time $ Low $$ Med. $$$ High

Value: M Med. H High HF Foundational NQ Not Quantifiable

Champion | Support

Cedar Falls, Iowa
Resilience Plan

W1 Action Set
Extreme Weather Readiness

This Action Set highlights the importance of adapting to shifting weather patterns which are becoming incrementally more extreme, posing safety and economic risks to the Cedar Falls community and individuals. The Action Set includes specific strategies and tactics for adapting to the shift.

Local Economy & Community
1 Local Business and Jobs
2 Business Talent and Local Amenities
3 Diversified Local Economy
4 Fair and Equitable Opportunity
5 Housing Options
6 Community Well-being

Weather & Nature
7 Extreme Weather Readiness
8 Extreme Rain Adaptation
9 Variation in Landscape and Habitat

Energy & Mobility
10 Diversified Renewable Energy
11 Pollution and Carbon Reductions
12 Mobility, Walkability and Bikeability

Champ Partners,
A Champion - Individuals/Stakeholders
B Champion - City
C Champion - Cedar Falls Utilities
D Time line
E Investment
F Value / Payback

W1	Actions	Plan Drivers & Co-benefits	Logistics
W1.1	**Plan for increasingly extreme wind events from derechos, thunderstorms and tornadoes** by continuing to rigorously enforce the existing building code provisions of wind resistance. Encourage 130 MPH wind & projectile resistant weather shelter areas in existing & new buildings & homes. Consider building or remodeling to a design wind speeds of 20 MPH above codes for new critical facilities & infrastructure such as medical facilities, public safety stations, energy/water/sewer facilities. As replaced, improve the resistance of roofs & other wind susceptible building features.		O TNQ H
W1.2	**Plan for increasingly extreme rainfall events that bring extended torrential rains** leading to localized flash flooding in creeks, ravines, streets, yards & basements. Incrementally adapt buildings & infrastructure to handle more rain. As homes, buildings, facilities & infrastructure are designed or renovated, consider up-sizing flat roof internal drains & scuppers, increasing stormwater capacity. Set first-floors higher than grade. Protect window wells, exterior stairwells, access drives, service & equipment pits & energy infrastructure from local flooding. Protect drinking water by assessing the vulnerability of wellhead protection areas & private wells to increased rain & flooding.		O NQ HF
W1.3	**Plan for warming temperatures as indicated by shifting Hardiness Zones & weather data.** Warming temperatures increase moisture & energize the atmosphere driving more extreme weather & increasing heat waves. Develop a groundwater plan that considers the impact of longer and extended dry-cycles on water resources.		O $NQ HF
W1.4	**Explore emergency back-up energy for essential facilities and services.** Weather and events, globally & locally are on a mega-trend towards higher levels of volatility. Appropiate levels of back-up energy (public, private & residential) for refrigeration, critical equipment, communications, cooling centers, cool rooms, and winter freeze protection can be vital for maintaining essential needs. Extreme weather can effect access to electrical power & natural gas.		NO $NQ H

Potential Partners & Stakeholders City/CFU, Middle Cedar Valley Watershed, developers, building and homeowners, landowners, contractors

Legend

Time: N Near-Term M Mid-Term L Long O On-going

Directly Focused on this Plan Driver

Investment: T Time $ Low $$ Med. $$$ High

Supports this Plan Driver

Value: M Med. H High HF Foundational NQ Not Quantifiable

Connects to this Plan Driver To

Champion

Support

Cedar Falls, Iowa
Resilience Plan

W2 Action Set

Blue-green Natural Corridors: Co-Benefits

This Action Set focuses on further enhancing the opportunities embodied by the existing Blue-green corridors in Cedar Falls. The corridors are an essential part of adapting to the increasingly extreme rain events occurring in Iowa and the region. Corridors can include additional recreation, mobility, and natural green space.

	Local Economy & Community						Weather & Nature			Energy & Mobility			Champ Partners,					
	Local Business and Jobs	Business Talent and Local Amenities	Diversified Local Economy	Fair and Equitable Opportunity	Housing Options	Community Well-being	Extreme Weather Readiness	Extreme Rain Adaptation	Variation in Landscape and Habitat	Diversified Renewable Energy	Pollution and Carbon Reductions	Mobility, Walkability and Bikeability	Champion - Individuals/Stakeholders	Champion - City	Champion - Cedar Falls Utilities	Time line	Investment	Value / Payback
	1	2	3	4	5	6	7	8	9	10	11	12	A	B	C	D	E	F
W2 Actions	**Plan Drivers & Co-benefits**												**Logistics**					
W2.1	**Enhance the co-benefits of the city's waterway and green space network** improving its natural vitality, beauty and the stormwater and recreation services it provides. Encourage naturalized management of the protected flood plain with pollinator and native plantings. Incentivize it by allowing the area of a floodplain on an individual lot to be 35% instead of 25% or less of a newly created lot if the area is permanently naturalized. Trail right-of-ways can also use this technique.															NMO	NQ	H
W2.2	**Create Blue-green corridor hubs co-locating stormwater management and outdoor recreation & mobility options** at the intersection of trails, bus routes with bike carriers, parking and rideshare drop-offs. Combine trails, outdoor fitness, relaxation/recreation areas with stormwater management/habitat ponds, rain gardens & natural plantings to manage rainfall run-off & increase native vitality. Locate key amenities so they are available using different transportation options.															NMO	$NQ	HF
W2.3	**Link corridors for natural vitality, rainwater management, and biking.** Work to re-naturalize sections of corridors that have been stripped of their natural plantings and re-link naturalized areas together with naturalized plantings. Use native, pollinator friendly plantings. Relinking and renaturalizing cooridors significantly improves their stormwater functions and native robustness. Add pedestrian/bike trails to corridors where they are missing if there is space available. Link them to other existing trails to help improve the Cedar Falls bike system.															NMO	NQ	HF
W2.4	**Include pollinator and bird friendly Native & Adapted plantings and trees** along Blue-green corridors to increase the level of existing natural vitality & rainfall absorption. Encourage corridor adjacent residences and businesses to adopt beneficial yard and landscape planting and maintenance protocols including bird-friendly window treatments and pollinator plantings.															NMO	T$	HF

Potential Partners & Stakeholders City/CFU, Tallgrass Prairie Center, developers, building and homeowners, landowners, landscape contractors, nurserys,

Legend

Directly Focused on this Plan Driver

Supports this Plan Driver

Connects to this Plan Driver To

Champion

Support

Time: N Near-Term M Mid-Term L Long O On-going

Investment: T Time $ Low $$ Med. $$$ High

Value: M Med. H High HF Foundational NQ Not Quantifiable

Cedar Falls, Iowa
Resilience Plan

W3 Action Set

Blue Green Corridor + LID Stormwater Management

This Action Set identifies specific ways the City and community can adapt to the shifting rainfall patterns in Cedar Falls, focusing on green infrastructure strategies that have a lower cost, flexibility, and multiple benefits, including recreation and natural space.

W3	Actions	Local Economy & Community: Local Business and Jobs (1)	Business Talent and Local Amenities (2)	Diversified Local Economy (3)	Fair and Equitable Opportunity (4)	Housing Options (5)	Community Well-being (6)	Weather & Nature: Extreme Weather Readiness (7)	Extreme Rain Adaptation (8)	Variation in Landscape and Habitat (9)	Energy & Mobility: Diversified Renewable Energy (10)	Pollution and Carbon Reductions (11)	Mobility, Walkability and Bikeability (12)	Champion - Individuals/Stakeholders (A)	Champion - City (B)	Champion - Cedar Falls Utilities (C)	Time line (D)	Investment (E)	Value / Payback (F)
		Plan Drivers & Co-benefits												Logistics					
W3.1	**Increase the existing stormwater system capacity to manage new development & increasing extreme rainfall volumes** by using Low Impact Development (LID), green-infrastructure & Blue-green corridors including planted bioswales, infiltration basins, retention ponds and native & adapted plantings where feasible in lieu of mown turf to increase infiltration. See Figures 8, 10, 18, 21, 23, 25, 26.																NMO	$$$	HF
W3.2	**Economically manage stormwater using a combination of site and district level approaches across Cedar Falls.** Focus new developments on site level stormwater management. Establish minimum compliance thresholds for new projects that not only meet current stormwater + detention requirements but are upgraded to protect against extreme rainfall. See W4.3 and Figures 12, 14, 15, 16, 17. Encourage "beyond compliance" with initiatives, education and grants.																O	NQ	HF
W3.3	**Incrementally increase use of available green space and stormwater capacity in already developed areas** of Cedar Falls by utilizing road reconstructions as opportunities for rain retention under streets & parking lots with oversized vaults, pipes & aggregate void space storage systems. Add bioswales where space permits. Use right-of-ways for retention and infiltration where possible incorporating district level retention storage in capital improvement projects utilizing vacated properties, if they become available. See W4.3 and Figures 8, 14, 8, 10, 18, 19.																O	$$$	HF
W3.4	**Reduce barriers to regional stormwater management** by investing in public-private partnerships, empowering staff to work beyond property line boundaries, implementing district-scale solutions, & creating a public private policy for financial contributions. Preserve open space & agricultural lands & promote stormwater best management practices to landowners upstream & outside the city limits.																NO	T	H

Potential Partners & Stakeholders City/CFU, Middle Cedar Valley Watershed, Tallgrass Prairie Center, developers, building and homeowners, landowners, landscape

Legend

Directly Focused on this Plan Driver | Supports this Plan Driver | Connects to this Plan Driver To

Champion | Support

Time: N Near-Term M Mid-Term L Long O On-going

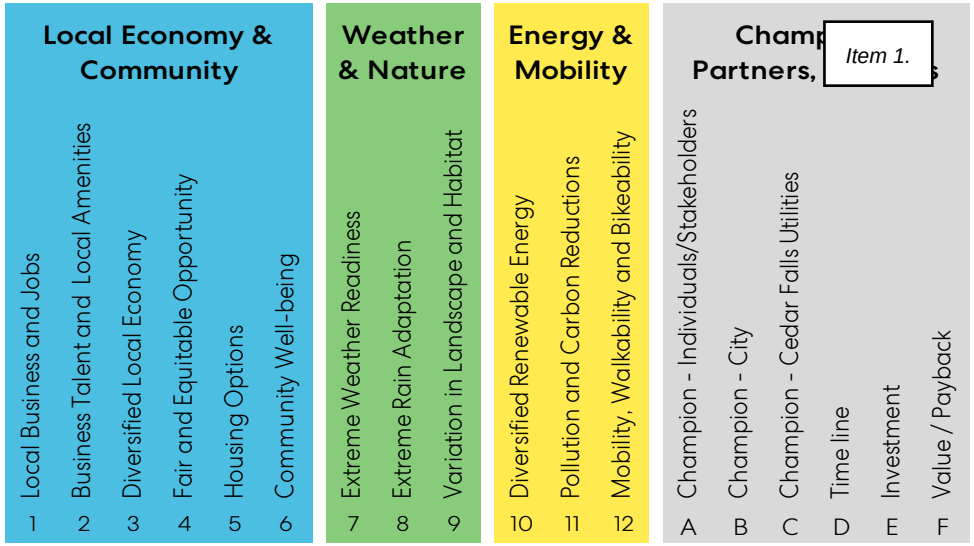
Investment: T Time $ Low $$ Med. $$$ High

Value: M Med. H High HF Foundational NQ Not Quantifiable

Cedar Falls, Iowa
Resilience Plan

W4 Action Set
Extreme Rainfall Management

This Action Set identifies specific ways the City and community can adapt to the extreme rainfall patterns becoming increasingly frequent in Iowa and the upper midwest. The actions focus on green infrastructure strategies due to their lower cost, flexibility, and multiple benefits, including recreation and natural space.



W4 Actions

W4.1 **During Capital Improvement Planning, perform an urban flash flood risk screen** as described in GIS Figure 20. (include storm and sanitary sewer, gas and electric). Use this Plan's GIS-dataset to frame risk, cost and benefit issues relative to extreme rain pooling, pressure and scouring. Incrementally evaluate existing infrastructure for potential changes to increase resilience during & after severe events.

W4.2 **Proactively improve extreme rainfall readiness** by continuing rigorous evaluations & hesitance to approve variance requests to floodplain & stormwater thresholds. Cedar Falls 500-year floodplain ordinance is a model for prudent risk management. Keep risk low by continuing to limit variances to elevation, freeboard & floodway fringe impact.

W4.3 **Manage extreme rainfall flows upstream from developed neighborhoods as new developments increase run-off & extreme rain events intensify.**
1. Require new projects to manage rain events either on-site or in developer provided naturalized district ponds/basins, or tanks.
2. Identify key locations for regional emergency management of extreme rain events with naturalized ponds & basins. Consider increasing stormwater utility fees as a funding source for extreme rain management. Purchase land & set aside for green-infrastructure, if needed. Refer to Figure 19. for specific rainfall event criteria.
3. Leverage existing right-of-way areas by using stormwater fees to provide dollars for stormwater management beyond the curb to curb area.
4. Leverage developer provided ponds as they are built by adding capacity for torrential rain events. To manage first-cost, dedicate land during the time-of-plat for anticipated increases in extreme rain driven by future temperature changes.
5. Continue the buy-out program of flood-prone areas & implement benefit creating projects such as flood-storage parks & natural habitat in these floodplain areas.

Potential Partners & Stakeholders City/CFU, Middle Cedar Valley Watershed, developers, building and homeowners, landowners, contractors

Legend

Time: N Near-Term M Mid-Term L Long O On-going

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Support

Investment: T Time $ Low $$ Med. $$$ High

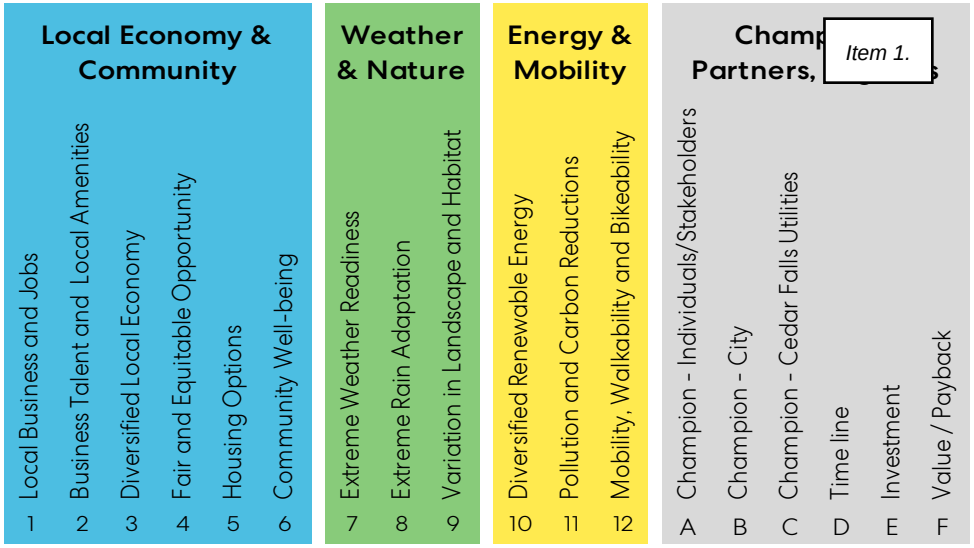
Value: M Med. H High HF Foundational NQ Not Quantifiable

Cedar Falls, Iowa
Resilience Plan

W5 Action Set

Beneficial Yardscapes + Landscapes

This Action Set identifies specific ways in which the City and community can create landscapes that are more resilient to more volatile weather patterns, including extended dry periods without rain and increasing amounts of rain during rainfall events. The actions also support landscape resilience by increasing the number of different plant species and providing plants that support pollinators.



W5 Actions	Plan Drivers & Co-benefits	Logistics
W5.1 **Promote a variety of Native & Adapted plantings & trees for residential / commercial yards & public landscapes.** Create attractive planted areas by combining groomed areas with other Native & Adapted plants. Consider promoting 70%-80% non-manicured landscapes with mulch, plant spacing, native mowable grass strips, paths & attractive fencing for a more formal look. Native & Adapted plants absorb rain run-off, don't spread aggressively, remain healthy on local rain levels partly by self-shading, sequester carbon & tolerate local pests.		NMO NQ H
W5.2 **Increase pollinator and bird habitat with Native & Adapted plantings.** Focus on the endangered Rusty Patched bumble bee which is native to Iowa and one of the best pollinators. Select Native & Adapted plantings that provide high levels of nutrients. Consider ankle or knee high pollinator lawns. Include bird safe decals/frit (paint) patterns on window glass facing planted areas.		NMO T$ HF
W5.3 **Plan for an ongoing shift in the Hardiness Growing Zone.** The shift is predicted to continue (see the Energy + Mobility category for more on shifting temperatures). Select hardy perennials and trees for yards, streets, parks and natural areas that can tolerate the current weather, and warmer temperatures, longer dry spells and more pests as the Hardiness Zone continues to shift.		O NQ HF
W5.4 **Encourage more rainwater harvesting for irrigation and habitat areas.** Conduct how-to education events for the public/business.		NO T HF
W5.5 **Reduce the use of pesticides & herbicides by growing Native & Adapted plants which** are typically more resistant to local pests allowing for an integrated pest management approach in yards + landscapes. Pesticides & herbicides are a recognized threat to drinking water, human health, wildlife diversity and pollinators.		NO T HF

Potential Partners & Stakeholders City/CFU, Tallgrass Prairie Center, developers, building and homeowners, landowners, landscape contractors, nurserys,

Legend

Directly Focused on this Plan Driver | Supports this Plan Driver | Connects to this Plan Driver To

Champion | Support

Time: N Near-Term M Mid-Term L Long O On-going

Investment: T Time $ Low $$ Med. $$$ High

Value: M Med. H High HF Foundational NQ Not Quantifiable

Cedar Falls, Iowa
Resilience Plan

E1 Action Set
Residential Energy Efficiency

This Action Set identifies specific residential energy use reduction strategies championed by Cedar Falls Utilities (CFU). While CFU can champion the strategies, energy use reductions can only be achieved through communitywide participation.

	Local Economy & Community						Weather & Nature			Energy & Mobility			Champ Partners,					
	Local Business and Jobs	Business Talent and Local Amenities	Diversified Local Economy	Fair and Equitable Opportunity	Housing Options	Community Well-being	Extreme Weather Readiness	Extreme Rain Adaptation	Variation in Landscape and Habitat	Diversified Renewable Energy	Pollution and Carbon Reductions	Mobility, Walkability and Bikeability	Champion - Individuals/Stakeholders	Champion - City	Champion - Cedar Falls Utilities	Time line	Investment	Value / Payback
	1	2	3	4	5	6	7	8	9	10	11	12	A	B	C	D	E	F
E1 Actions	**Plan Drivers & Co-benefits**												**Logistics**					
E1.1	**Continue voluntary energy use reduction programs for existing & new homes.** Anticipated Reductions are through CFU programs and community & non-profit campaigns.															N	$	H
E1.2	**Continue voluntary energy audits.** CFU has an audit program that has successfully reached many homes. Use available energy use data to focus outreach about the program on homes with high-potential for efficiency improvements and implementation.															N	$	H
E1.3	**Explore energy efficiency loan & community grant programs** by making them available to Cedar Falls residents. CFU is currently working with the IEDA on a PAYS program for statewide energy efficiency.															NM	T	H
E1.4	**Coordinate energy efficiency programs with the neighborhood revitalization efforts & Community Development Block Grants** for income qualified community members. Facilitate grants or low-cost loan supplements for existing & new workforce/essential housing providing funds to upgrade existing homes and new structures which will create jobs.															NM	T	H
E1.5	**Continue with Cedar Falls Utilities efficiency programs:** LED Lighting. Expand older home Weather Stripping, insulation and water efficiency efforts.															N	$	H

Potential Partners & Stakeholders CFU/City, electrical/heating & cooling equipment suppliers & installers / builders, buidling supply/ hardware stores, home & apartment

Legend

Time: N Near-Term M Mid-Term L Long O On-going

Directly Focused on this Plan Driver

Supports this Plan Driver

Connects to this Plan Driver To

Investment: T Time $ Low $$ Med. $$$ High

Value: M Med. H High HF Foundational NQ Not Quantifiable

Champion

Support

Cedar Falls, Iowa
Resilience Plan

E2 Action Set
Commercial & Industrial Energy Efficiency

This Action Set identifies the specific energy use reduction strategies for commercial building and industrial facilities championed by Cedar Falls Utilities (CFU). While CFU can champion these strategies, energy use reductions can only be achieved through participation by Cedar Falls businesses and organizations.

Local Economy & Community
1 Local Business and Jobs
2 Business Talent and Local Amenities
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4 Fair and Equitable Opportunity
5 Housing Options
6 Community Well-being

Weather & Nature
7 Extreme Weather Readiness
8 Extreme Rain Adaptation
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Energy & Mobility
10 Diversified Renewable Energy
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Champ... Partners, ...s
A Champion - Individuals/Stakeholders
B Champion - City
C Champion - Cedar Falls Utilities
D Time line
E Investment
F Value / Payback

E2 Actions	Plan Drivers & Co-benefits	Logistics
E2.1 **Voluntary energy use reduction for existing & new commercial and industrial buildings.** Anticipated reductions are through existing and future CFU Energy Efficiency programs.		N $ H
E2.2 **Execute energy efficiency actions for existing City & public facilities.** Cedar Falls Schools, City of Cedar Falls and CFU facility audits were completed in 2020 and results shared with the organizations to help focus improvement.		N $ H
E2.3 **Continue voluntary commercial building energy audits and energy modeling.** CFU is heavily focused on the institutional and business communities providing energy audits, numerous incentive programs and assessments of existing and new facilities.		N $ H
E2.4 **Continue voluntary energy audits for industrial facilities.** CFU is heavily focused on the industrial business community providing energy audits, numerous incentive programs and assessments of existing and new facilities.		N $ H
E2.5 **Support on-site renewable energy on existing & new public and private facilities.** CFU supports the installation and connecting of renewable generation systems to CFU's electric distribution system on institutional and commercial facilities. CFU is heavily involved in and is providing strong guidance for the design of the new high school and potential solar project on the school property.		NM $$ A
E2.6 **Support the installation and connecting of renewable generation systems** to CFU's electric distribution system on industrial facilities.		NM $ H

Potential Partners & Stakeholders CFU/City, PV & electrical/heating & cooling equipment suppliers & installers / builders, buidling supply/ hardware stores, facility owners

Legend

Time: N Near-Term M Mid-Term L Long O On-going

Directly Focused on this Plan Driver

Investment: T Time $ Low $$ Med. $$$ High

Supports this Plan Driver

Value: M Med. H High HF Foundational NQ Not Quantifiable

Connects to this Plan Driver To

Champion

Support

Cedar Falls, Iowa
Resilience Plan

E3 Action Set

Lower-Polluting Renewable Electricity

This Action Set identifies specific pollution reduction goals for Cedar Falls Utilities (CFU) provided electricity. The actions and strategies listed in this Action Set will be championed and implemented by CFU. Community actions and other opportunities for supporting pollution reductions are outlined in other portions of the plan.

	Local Economy & Community						Weather & Nature			Energy & Mobility			Champ Partners,					
	Local Business and Jobs	Business Talent and Local Amenities	Diversified Local Economy	Fair and Equitable Opportunity	Housing Options	Community Well-being	Extreme Weather Readiness	Extreme Rain Adaptation	Variation in Landscape and Habitat	Diversified Renewable Energy	Pollution and Carbon Reductions	Mobility, Walkability and Bikeability	Champion - Individuals/Stakeholders	Champion - City	Champion - Cedar Falls Utilities	Time line	Investment	Value / Payback
	1	2	3	4	5	6	7	8	9	10	11	12	A	B	C	D	E	F
E3 Actions							**Plan Drivers & Co-benefits**						**Logistics**					
E3.1	**Community-wide pollution reductions from CFU provided electricity and natural gas:** From 2010 to 2030 reduce CO2e by 45%, NOx by 63% and SOx by 90%. Carbon Neutral by 2050						Achievement of carbon neutrality is heavily dependent on technology innovations in areas such as fuels, power generation and carbon removal. CFU's strategy will adapt based on future economics and evolving energy technology.									L	TNQ	HF
E3.2	**Support customer owned renewable resources.** CFU supports the installation and connecting of renewable generation systems to CFU's electric distribution system.															M	T	
E3.3	**Evaluate increased market energy purchases to take advantage of Iowa's growing renewable resources.** The regional generation portfolio (MISO - Midcontinent Independent System Operator power grid) has an increasing amount of wind and solar. This lowers emissions in Cedar Falls when CFU purchases market energy. Wind has grown from 16% of the energy produced in Iowa in 2010 to 57% in 2021.															M	TBD	HF
E3.4	**Evaluate low-emission, renewable generation supply and transmission options both locally and regionally.** Transmission capacity will be important to support the addition of more renewables and other low emission generation options in Iowa and the regional power grid (MISO - Midcontinent Independent System Operator power grid).															M	TBD	HF
E3.5	**Continue to invest in the resiliency of CFU owned infrastructure.**															L	$	H

Potential Partners & Stakeholders CFU, electrical/heating & cooling equipment suppliers & installers / builders, buidling supply/ hardware stores, home & apartment owners

Legend

Directly Focused on this Plan Driver | Supports this Plan Driver | Connects to this Plan Driver To | Champion | Support

Time: N Near-Term M Mid-Term L Long O On-going

Investment: T Time $ Low $$ Med. $$$ High

Value: M Med. H High HF Foundational

Cedar Falls, Iowa
Resilience Plan

E4 Action Set
Lower-Polluting Heating Energy

This Action Set identifies specific pollution reduction goals for Cedar Falls Utilities (CFU) provided electricity and natural gas used for heating energy. The actions and strategies listed in this Action Set will be championed and implemented by CFU. Community actions and other opportunities for supporting pollution reductions are outlined in other portions of the plan.

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Champ... Partners, ...
A Champion - Individuals/Stakeholders
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D Time line
E Investment
F Value / Payback

E4 Actions		Plan Drivers & Co-benefits	Logistics
E4.1	**Community-wide pollution & carbon reductions from CFU provided electricity and natural gas:** From 2010 to 2030 reduce CO2e by 45%, NOx by 63% and SOx by 90%. Carbon Neutral by 2050	Achievement of carbon neutrality is heavily dependent on technology innovations in areas such as fuels, power generation and carbon removal. CFU's strategy will adapt based on future economics and evolving energy technology.	L TNQ HF
E4.2	**Pursue alternative natural gas options.** Eliminating all use of liquid & gas fuels over the next 30 years is not considered feasible. Potential options include demand and energy reduction through efficiency, replacement of non-renewable liquid & gas fuels w/ renewable versions, electrification, carbon capture, sequestration and other resources and methods of attaining a carbon neutral community as may be developed in the next 30 years.		L TNQ HF

Potential Partners & Stakeholders

Legend

Time: N Near-Term M Mid-Term L Long O On-going

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Directly Focused on this Plan Driver

Investment: T Time $ Low $$ Med. $$$ High

Supports this Plan Driver

Value: M Med. H High HF Foundational NQ Not Quantifiable

Connects to this Plan Driver To

Champion

Support

Cedar Falls, Iowa
Resilience Plan

E5 Action Set
Lower Polluting, Mobility Options

This Action Set identifies strategies for reducing pollution from transportation. Some strategies will be championed by Cedar Falls Utilities (CFU) and the City, while community members must champion others. Reducing pollution from transportation can only be achieved through participation by the Cedar Falls community, including individuals, businesses, and organizations.

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E5 Actions	Plan Drivers & Co-benefits	Logistics
E5.1 **Incrementally convert city and CFU fleet to hybrid electric or electric vehicles (EV's).** Converting fleets to EVs or other low emissions technologies can occur as the technology matures and becomes available in Iowa.		NM $ H
E5.2 **Promote voluntary use of hybrid electric & electric vehicles (EV's):** CFU supports customers who have adopted the use of EV's in Cedar Falls. CFU & the City have installed a L2 EV charger in Cedar Falls for public use. CFU encourages customers to join othe CFU EV community by registering their EV w/ CFU on the website.		NM $ H
E5.3 **Continue to support the EV Charging Station program** for businesses, institutions, commercial & residential users.		NM $ H
E5.4 **Continue to support electrification/low emission alternatives to ICE (internal combustion engines).**		
E5.5 **Explore development of a local, rideshare co-op or private program** operating EV or hybrid electric vehicles providing subscription service for seniors and the disabled. Unsubscribed time can be used for on-demand service to all. Require commuter bike racks on all rideshare cars. Assist rideshare owner / drivers in identifying and securing grants or low-cost loans if needed for installing racks on their automobiles.		NM T$ HF
E5.6 **Complete the bike trail and commuter routes in Cedar Falls - refer to the Bike-Pedestrian Plan.** The existing Cedar Falls bike trail system is robust & offers the opportunity to improve mobility options for individuals in the community. A local rideshare co-op with commuter bike racks can help complete the bike trail / route systems as an alternative mobility choice.The result would be an even stronger amenity for the Cedar Falls community members and as a business talent attraction.		NM $$ HF

Potential Partners & Stakeholders CFU/City, Auto & vehicle dealers, electrical suppliers suppliers & installers, solar PV suppliers/installers, home/facility owners,

Legend

Directly Focused on this Plan Driver
Supports this Plan Driver
Connects to this Plan Driver To

Time: N Near-Term M Mid-Term L Long O On-going

Investment: T Time $ Low $$ Med. $$$ High

Value: M Med. H High HF Foundational NQ Not Quantifiable

Champion
Support

Cedar Falls, Iowa
Resilience Plan

E6 Action Set

Landfill Waste Reduction and Diversion

This Action Set identifies specific waste and recycling goals for the Cedar Falls community. The actions and strategies listed in this Action Set must be championed and implemented primarily by community members with support from the City.

Local Economy & Community

1 Local Business and Jobs
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E6 Actions		Plan Drivers & Co-benefits	Logistics
E6.1 **Pursue incremental advancement towards Zero Waste by 2070.** Waste Reduction: 2030 2%, 2040 9%, 2050 18% Recycling Rate: 2030 44%, 2040 72%, 2050 94%	The timeline for Zero Waste extends beyond the 2050 goal for Carbon Neutral energy due to a lag in sustainable material technology and the way products designed compared to renewable energy and EV vehicle design.		L TNQ HF
E6.2 **Encourage development of the local circular economy.** Promote reuse/shared use opportunities: - Tool rental and lending library - Product repair shops, - Resources that sell used products	Many products sit idle for most of their life. Cost of ownership and environmental impact can be reduced through sharing programs, rental options, and repair providing local jobs and business opportunities.		L T HF
E6.3 **Explore a voluntary curbside composting co-op** operated by local farmers for restaurants & residents: Privately funded feasibility study: 2023 Pilots Program (if feasible): 2025 Expanded start-up (if feasible): 2027	The co-op could pick-up easy to compost organic materials using an electric vehicle. Composting of bio-based plastics could start with operation of a pilot biomass reactor for renewable natural gas production in 2035 (see Action Set E5).		M T H
E6.4 **Encourage a Consumer Campaign promoting voluntary plastic waste and waste use-reductions:** Targets: 2030 15%, 2040 40%, 2050 75%	Expand local use of compostable bio-based plastic & natural fiber based food containers which could could be substituted for feasibly non-recyclable items. Promote reusable bags (including veggies), bottles / containers and utensils.		L T HF

Potential Partners & Stakeholders CFU/City, Auto & vehicle dealers, electrical suppliers suppliers & installers, solar PV suppliers/installers, home/facility owners,

Legend

Directly Focused on this Plan Driver
Supports this Plan Driver
Connects to this Plan Driver To

Champion
Support

Time: N Near-Term M Mid-Term L Long O On-going

Investment: T Time $ Low $$ Med. $$$ High

Value: M Med. H High HF Foundational NQ Not Quantifiable

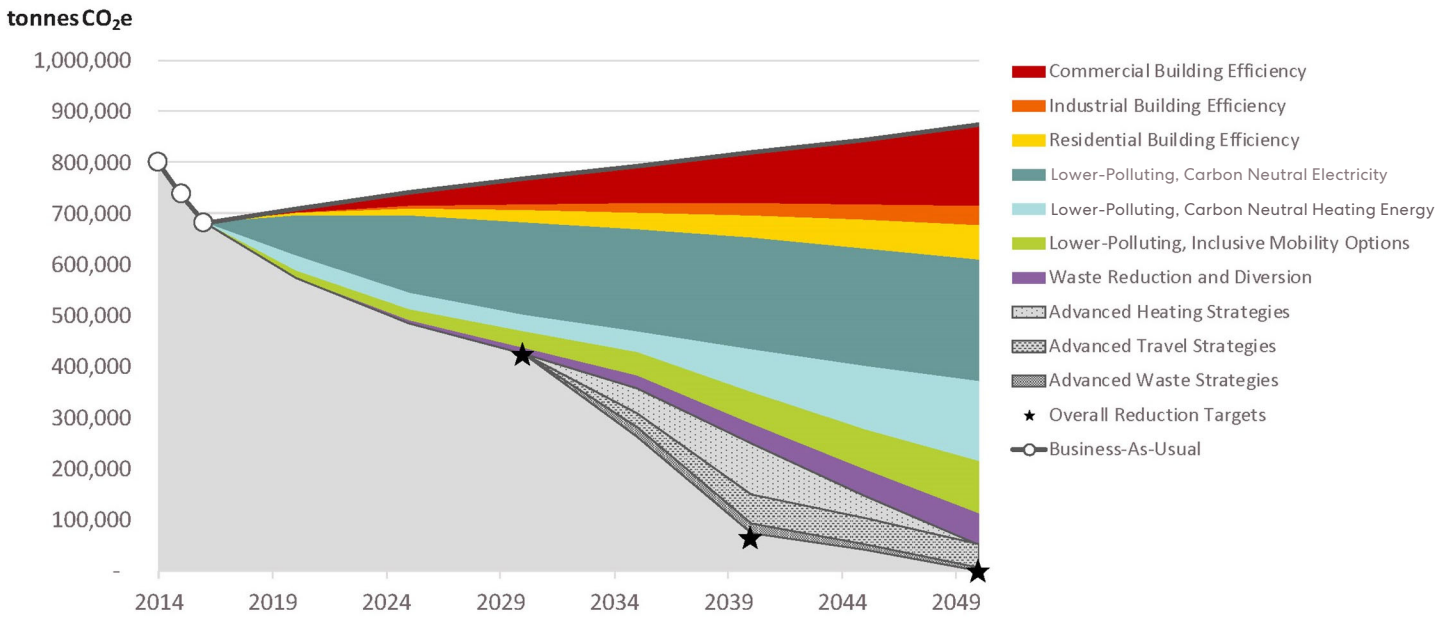
Appendix

CEDAR FALLS CARBON POLLUTION REDUCTION SCENARIO – SUPPORTING INFORMATON

May 3, 2021

Cedar Falls has developed a scenario outlining different strategies that can be leveraged to reduce carbon pollution between now and 2050. This scenario represents one potential pathway for Cedar Falls based on a set of community-specific assumptions developed through the resilience planning process. These assumptions will change over time as strategies are proven more or less effective due to shifting policies, market drivers, emerging technologies, and community needs. The scenario includes baseline data from 2014-2016, a "business-as-usual" trajectory through 2050, overall reduction targets for 2030, 2040, and 2050, and a series of reduction "wedges".

Figure 1: Cedar Falls Carbon Reduction Scenario



The baseline data reflects the results from the community-wide carbon pollution inventory, including emissions from activities occurring within the community such as building energy use, vehicle travel, and waste generation. The business-as-usual trajectory represents what could happen if the community grows in population as predicted while continuing to emit carbon at the same rates as in 2016.

The overall reduction targets were established by the Cedar Falls resilience planning team to guide this exercise. The 2030 target was selected based on established technologies and reduction techniques to be both meaningful and achievable. The 2040 and 2050 targets are based on per capita carbon budgets calculated using the goals established by an international organization of scientists representing 195 member countries (including the United States) through an open and transparent review of the thousands of scientific papers published each year on the topic (IPCC 1.5 Report). The overall reduction targets for Cedar Falls equate to a 42% reduction from 2015 levels by 2030, a 91% reduction by 2040, and net-zero carbon by 2050.

The reduction wedges represent one potential pathway to close the gap between the business-as-usual trajectory and the overall reduction targets. They reflect a series of carbon pollution reduction strategies developed with input from Cedar Falls' stakeholders and community members, accounting for:

- Existing policies, such as building energy codes and federal vehicle fuel economy standards;
- Established goals, such as Cedar Falls Utilities goals to reduce their carbon emissions 45% from 2010 levels by 2030 and achieve carbon-neutrality by 2050;
- Anticipated market trends – such as an increase in electric vehicles – adjusted based on feedback from the community; and
- Potential reduction strategies developed through the resilience planning effort, such as exploring renewable natural gas and diverting waste from the landfill. These strategies are reflected in the action sets for the community laid out in this plan.

While established technologies and reduction techniques are anticipated to make significant progress toward these long-term goals in Cedar Falls, the final portion - represented by the "Advanced Strategies" - are dependent on emerging technologies and techniques, likely including a combination of additional carbon pollution reduction plus carbon removal from the atmosphere and sequestration.

Participation rates in each reduction strategy:

Commercial Energy Efficiency		2030	2040	2050	Assumptions/Context:
New Building Efficiency	Percentage of energy saved by the specified year in new buildings compared to efficiency levels required by the energy code	5%	7%	9%	• Updates to Iowa's Commercial Energy Code (currently 2012 IECC with amendments) are assumed to be adopted every six years and energy efficiency advancements in future IECC code versions are assumed to continue based on historical trends. • New buildings can be incentivized to achieve beyond-code energy savings through market pressure or by participating in programs offered by Cedar Falls Utilities.
Existing Building Efficiency	Percentage of energy saved by the specified year in existing commercial buildings compared to the business-as-usual scenario due to energy efficiency program participation	5%	7%	9%	• Cedar Falls Utilities offers energy efficiency programs to help customers reduce their energy consumption. From 2010-2019, savings from these programs ranged from 0.295% to 1.819% of total electricity sales and from 0.285% to 0.642% of total natural gas sales. • Through 2030, CFU aims for these programs to result in new annual electricity savings equal to 0.635% of total sales and new annual natural gas savings equal to 0.370% of total sales. Savings from energy efficiency programs are assumed to be persistent over time. For example, installing a high-efficiency lightbulb will achieve savings over the lifetime of the bulb, not just in the first year. These targeted savings rates are applied equally across building sectors and are cut in half for the years 2031-2050, assuming that much of the market will have already been saturated. • Responses to a public survey showed that 71% of the 261 respondents would be interested in an energy or water audit for their home, business, or institution to identify savings opportunities.

Industrial Energy Efficiency		2030	2040	2050	Assumptions/Context:
New Building Efficiency	Percentage of energy saved by the specified year in new buildings compared to efficiency levels required by the energy code	5%	7%	9%	• Updates to Iowa's Commercial Energy Code (currently 2012 IECC with amendments) are assumed to be adopted every six years and energy efficiency advancements in future IECC code versions are assumed to continue based on historical trends. • New buildings can be incentivized to achieve beyond-code energy savings through market pressure or by participating in programs offered by Cedar Falls Utilities.
Existing Building/Process Efficiency	Percentage of energy saved by the specified year in existing industrial buildings compared to the business-as-usual scenario due to energy efficiency program participation	5%	7%	9%	• Cedar Falls Utilities offers energy efficiency programs to help customers reduce their energy consumption. From 2010-2019, savings from these programs ranged from 0.295% to 1.819% of total electricity sales and from 0.285% to 0.642% of total natural gas sales. • Through 2030, CFU aims for these programs to result in new annual electricity savings equal to 0.635% of total sales and new annual natural gas savings equal to 0.370% of total sales. Savings from energy efficiency programs are assumed to be persistent over time. For example, installing a high-efficiency lightbulb will achieve savings over the lifetime of the bulb, not just in the first year. These targeted savings rates are applied equally across building sectors and are cut in half for the years 2031-2050, assuming that much of the market will have already been saturated. • Responses to a public survey showed that 71% of the 261 respondents would be interested in an energy or water audit for their home, business, or institution to identify savings opportunities.
Residential Energy Efficiency		**2030**	**2040**	**2050**	**Assumptions/Context:**
New Building Efficiency	Percentage of energy saved by the specified year in new homes compared to efficiency levels required by the energy code	5%	7%	8%	• Updates to Iowa's Residential Energy Code (currently 2012 IECC with amendments) are assumed to be adopted every six years and energy efficiency advancements in future IECC code versions are assumed to continue based on historical trends. • New homes can be incentivized to achieve beyond-code energy savings through market pressure or by participating in programs offered by Cedar Falls Utilities.
Existing Building Efficiency	Percentage of energy saved by the specified year in existing homes compared to the business-as-usual scenario due to energy efficiency program participation	5%	7%	8%	• Cedar Falls Utilities offers energy efficiency programs to help customers reduce their energy consumption. From 2010-2019, savings from these programs ranged from 0.295% to 1.819% of total electricity sales and from 0.285% to 0.642% of total natural gas sales. • Through 2030, CFU aims for these programs to result in new annual electricity savings equal to 0.635% of total sales and new annual natural gas savings equal to 0.370% of total sales. Savings from energy efficiency programs are assumed to be persistent over time. For example, installing a high-efficiency lightbulb will achieve savings over the lifetime of the bulb, not just in the first year. These targeted savings rates are applied equally across building sectors and are cut in half for the years 2031-2050, assuming that much of the market will have already been saturated. • Responses to a public survey showed that 71% of the 261 respondents would be interested in an energy or water audit for their home, business, or institution to identify savings opportunities.

Lower-Polluting, Carbon Neutral Electricity		2030	2040	2050	Assumptions/Context:
Cleaner Electricity Grid	Percentage reduction in CO2e emissions per kWh of electricity from 2010	70%	85%	100%	• CFU has a goal of reducing emissions 45% from 2010 levels by 2030 and reaching carbon neutral electricity generation by 2050. • Based on a significant increase in renewables to the Iowa grid, CFU anticipates that a 70% reduction in their electricity emissions rate from 2010 levels is possible by 2030. • For 2031-2050, the emissions factor for electricity follows a linear trajectory to CFU's goal of carbon neutrality by 2050.
Local Renewable Electricity	Local renewable electricity generation (MW) in the specified year	1.8 MW	2.9 MW	4.1 MW	• In 2019, 0.07% of total community electricity was produced by customer-owned wind and solar resources (approximately 300 kW of capacity). • CFU provided estimates for customer-owned renewable generation through 2030 (approximately 1.8 MW of capacity). A linear forecast was used to extend this out to 2050, which would require approximately 4.1 MW of capacity. • Installing solar on all buildings in Cedar Falls with adequate roof space and solar access would result in an estimated 224 MW of total solar capacity.[1] This would produce enough electricity to meet nearly half of the community's total. Over 20 rooftops in the city have the capacity to host 1 MW+ of solar each. • Responses to a public survey showed that – depending on the cost implications – 78% of the 260 respondents would be interested in subscribing to a local community solar power program for their home, business, or institution.
Lower-Polluting, Carbon Neutral Heating Energy		**2030**	**2040**	**2050**	**Assumptions/Context:**
Reduce Coal Use	Percentage of baseline (2016) coal use that is transitioned to natural gas by the specified year	90%	99%	99%	• This strategy assumes by 2040, coal, coke, and fuel oil are reserved for emergency use only.
Alternative Natural Gas	Percentage of business-as-usual natural gas that is replaced with alternative natural gas in the specified year	0%	33%	100%	• This strategy models a tiered approach to adding alternative natural gas fuels for Cedar Falls that are carbon neutral. The scenario assumes the transition to alternative fuels occurs incrementally working up to full capacity by 2050. • Alternative fuels are assumed to be carbon neutral. This will require careful design and management.
Commercial Electric Heating	Percentage of commercial buildings that use electricity for space and water heating by the specified year	10%	30%	42%	• Electric heating rates are based on a medium-electrification scenario based on NREL's Electrification Futures Study.[2]
Residential Electric Heating	Percentage of homes that use electricity for space and water heating by the specified year	25%	44%	56%	• Electric heating rates are based on a medium-electrification scenario based on NREL's Electrification Futures Study.[3]

[1] Project Sunroof data explorer, Cedar Falls (November 2018).
[2] E3 Pathways model for Xcel Energy's Upper Midwest Energy Plan (October 2018), available from Xcel Energy.
[3] Ibid.

<table>
<tr><th>Lower-Polluting, Inclusive Mobility Options</th><th></th><th>2030</th><th>2040</th><th>2050</th><th>Assumptions/Context:</th></tr>
<tr><td>Inclusive Mobility Options</td><td>Percentage reduction from baseline (2016) vehicle miles traveled (VMT) per resident due to increased walking, biking, transit ridership, telecommuting, ride-sharing, and trip efficiency</td><td>9%</td><td>10%</td><td>12%</td><td>

In 2019, an average of 15.9 miles were driven daily per person in Cedar Falls - 4% less than the community's 2010 average.[1] As a whole, the city is bikeable yet car-dependent, with minimal transit.[2] The table below shows how Cedar Falls compares to other Iowa cities.
<table>
<tr><th>City</th><th>2019 average daily vehicle miles traveled per person</th><th>% difference from Cedar Falls</th><th>Walkscore (1-100)</th><th>Bikescore (1-100)</th></tr>
<tr><td>Waterloo</td><td>21.2</td><td>+33%</td><td>37</td><td>48</td></tr>
<tr><td>Dubuque</td><td>17.7</td><td>+11%</td><td>40</td><td>34</td></tr>
<tr><td>Cedar Falls</td><td>15.9</td><td>0%</td><td>38</td><td>57</td></tr>
<tr><td>Mason City</td><td>14.9</td><td>-6%</td><td>38</td><td>54</td></tr>
<tr><td>Iowa City</td><td>13.2</td><td>-17%</td><td>44</td><td>64</td></tr>
<tr><td>Ames</td><td>9.9</td><td>-38%</td><td>43</td><td>68</td></tr>
</table>

In 2018, most Cedar Falls' commuters (81%) reported driving alone to work most of the time, with 8% walking, 5% carpooling, 4% working from home, 1% biking, and less than 1% using public transportation.[3]
Nearly two-thirds of the 252 respondents to a public survey reported being interested in increased walking and biking as personal mobility options. Increased public transit and increased telecommuting were each of interest to about a quarter of the respondents, while car-sharing appealed to less than 10%.
Responses to a public survey revealed a wide range of opinions regarding community-wide goals for reducing vehicle travel, with common themes that mode of transportation should continue to be a personal choice and that the City can help improve mobility and livability by improving the community's walkability and bikeability. Travel distance and weather were identified as top barriers to walkability and bikeability. Overall, slightly more people (100) responded that vehicle travel should decrease than stay the same or increase (93).
The vehicle travel reduction shown here is based on a modest, but lasting trend toward telecommuting post-coronavirus as well as long-term enhancements to the regional bicycle and pedestrian infrastructure network and improvements in rideshare capacity.

</td></tr>
<tr><td>Fuel Economy</td><td>Percentage reduction from baseline (2016) in average fuel consumed per mile traveled by gasoline light-duty vehicles driving within the community</td><td>16%</td><td>22%</td><td>25%</td><td>

The existing CAFE standards for new vehicles will be met through 2026.[4] In the absence of additional regulation, new vehicle fuel economy is assumed to remain constant from 2026-2050.
New vehicle purchases in Cedar Falls align with national trends – approximately 5% per year.[5]

</td></tr>
</table>

					• The breakdown between passenger cars and light trucks (including SUVs) aligns with national trends. By 2030, 75% of light vehicle purchases are forecasted to be trucks and SUVs.[6]
Electric Vehicles	Percentage of light-duty vehicles that drive within City boundaries that are electric by the specified year	9%	31%	64%	• EV penetration rates are based on global forecasts.[7] • Nearly 30% of the 252 respondents to a public survey reported being interested in electric vehicles as a personal mobility option. • Responses to a public survey suggest that Cedar Falls should target EV adoption in line or slower than national trends, and noted mileage range, availability of charging infrastructure, and initial vehicle costs as the primary barriers to EV adoption. • In 2018, Iowa was ranked among the top ten best states for EV ownership due to factors such as number of charging stations, high year-over-year increase in EV sales, and fuel costs.[8]
	Percentage of heavy-duty vehicles that drive within City boundaries that are electric by the specified year	2%	6%	12%	

[1] Iowa Department of Transportation, Vehicle Miles Traveled.
[2] Walk Score, a national scoring system that evaluates walkable and bikeable routes to nearby amenities. Scores range from 0-100, where 0 is completely car dependent and 100 is a walker/biker's paradise.
[3] U.S. Census, 2018 American Community Survey 5-Year Estimates Subject Tables for Cedar Falls, "Commuting Characteristics by Sex."
[4] Safer Affordable Fuel-Efficient (SAFE) Vehicles Rule. NHTSA and EPA finalized CAFE and carbon dioxide emissions standards for vehicle model years 2021-2016 on March 31, 2020, regulating how far new vehicles must travel on a gallon of fuel. Per EPA, a 20% reduction from CAFE Standards is assumed based on real-world driving conditions (city vs. highway driving, weather conditions, driver acceleration. air conditioning use). CAFE Standards vary based on vehicle footprint. In the absence of detailed information regarding vehicle sales by footprint size, CAFE Standards for cars with a footprint of 49 sf and trucks with a footprint of 54 sf were used. These represent midpoints in the size ranges.
[5] Transportation Energy Data Book Edition 38.1 (2020), Oak Ridge National Laboratory. The historic (1970-2018) annual new vehicle purchase rate is calculated by dividing the new car and light truck purchases (Table 3.5 New Retail Vehicle Sales) by the total light duty vehicle registrations (Table 4.3 Summary Statistics for Light Vehicles). The purchase rate has been decreasing since 1970, and a linear forecast is used to predict purchase rates for the years 2020-2030. Rates are assumed to hold constant from 2030-2050.
[6] Transportation Energy Data Book Edition 38.1 (2020), Oak Ridge National Laboratory, Table 4.7 New Retail Sales of Trucks 10,000 Pounds GVW and Less in the United States. The percentage of light vehicle sales that are light trucks (vs. cars) has grown significantly since 1970. A linear forecast is used to predict rates for the years 2020-2030. Rates are assumed to hold constant from 2030-2050.
[7] BloombergNEF, Electric Vehicle Outlook 2020.
[8] YourMechanic.com, "Which States Love Electric Vehicles the Most?", October 3, 2018.

Waste		2030	2040	2050	Assumptions/Context:
Waste Reduction	Percentage reduction in municipal solid waste per capita by the specified year from 2016 baseline	2%	9%	18%	• Iowa has a statewide 50% waste diversion goal from 1988 through source reduction and recycling.[1] This is being met by Black Hawk County. • Cedar Falls sends 5.5-6.5 pounds to the landfill per person per day. The 2017 U.S. daily average waste generation per person is 4.5 lbs and the worldwide average is 1.6 lbs.[2] • Iowa's current waste stream is estimated to be 33% recyclable, 31% compostable, 29% non-marketable, and 7% reusable.[3] • Cedar Falls currently offers unit-based pricing to incentivize waste reduction. • Several local organizations support waste reduction, material reuse, and manufacturing innovation, including the Iowa Department of Natural Resources' Iowa Waste Exchange (IWE) and the Iowa Waste Reduction Center (IWRC) at the University of Northern Iowa. • This strategy models a pathway to zero waste by 2070, with the following milestones: ○ Single-use plastic is reduced by 15% by 2030, 40% by 2040, and 75% by 2050. ○ 75% of materials and products that are currently considered "non-marketable" waste has been redesigned to be compostable, recyclable, or reusable by 2050. ○ All reusables are removed from the waste stream by 2050.
Recycling	Percentage of municipal solid waste that is recycled (including organics recycling) in the specified year	44%	72%	94%	• Based on national averages, 32% of the city's waste is currently estimated to be recycled or composted.[4] • This strategy models a pathway to zero waste by 2070, with the following milestones: ○ 75% of materials and products that are currently considered "non-marketable" waste has been redesigned to be compostable, recyclable, or reusable by 2050. All organics are recycled by 2040. ○ All recyclables are recycled by 2050

[1] 567 IAC Chapter 101.6
[2] U.S. average from the U.S. Environmental Protection Agency, National Overview, accessed August 13, 2020.
[3] SCS Engineers, "2017 Iowa Statewide Waste Characterization Study," prepared for the Iowa Department of Natural Resources, December 28, 2017.
[4] U.S. Environmental Protection Agency, Advanced Sustainable Materials Management "2018 Facts and Figures Fact Sheet."

Cedar Falls

Resilience Plan

Commitment & Creativity for a Better Tomorrow

May 2022

Cedar Falls

Resilience Plan – City Council Presentation

May 16, 2022

Opening Statement about the Plan

We live in a rapidly changing world.
The *need* for resilience is high.

What is Resilience? Being a community that is proactive, prepared, and flexible in the midst of change.

Plan Purpose:
Identify actions needed as a community

Provide an action guide that not only utilizes existing community plans and actions, but also seeks community involvement to identify additional actions needed to improve our prosperity and stability.

Planning Process

The Process

(8) month long stepped approach
Builds forward from what was learned previously.

(23) opportunities for participation by the community:

- (12) online workshops
- (6) self-guided workshops
- (4) public worksheets
- (1) Townhall Meeting

The process allowed the core team to systematically identify, explore and refine the issues important to the community

Micro-website
https://cfresilience.com/

The Process

Figure 1. Resilience Plan Public Participation & Engagement Schedule

Public Participation	**2020**
September 22 thu October 03, 2020	Online public Survey Parts 1 and 2 – Round 1
October 20 thru October 30	Online public Survey Parts 1 and 2 - Round 2
Oct. 20th - Nov. 3rd	Big Idea Public Workshops and Self-Guided Workshops
October 20	Workshop: Ecology, Land and Habitat
	Online Self-Guided Workshop: Ecology, Land and Habitat
October 21	Workshop: Water, Weather and Urban Flooding
	Online Self-Guided Workshop: Water, Weather and Urban Flooding
October 22	Workshop: Energy, Mobility and Transportation
	Online Self-Guided Workshop: Energy, Mobility and Transportation
October 27	Workshop: Community Cohesion and Civic Services
	Online Self-Guided Workshop: Community Cohesion and Civic Services
October 28	Workshop: Equity, Diversity and Well-being
	Online Self-Guided Workshop: Equity, Diversity and Well-being
October 29	Workshop: Jobs, Business and Economy
	Online Self-Guided Workshop: Jobs, Business and Economy
November 03	Online Self-Guided Workshops Close
November 10	Workshops Summary Town Hall Meeting
December 15 thru 22	Online public Worksheet, Parts 1 and 2
December 15 Thru 22	Online public Survey Parts 1 and 2 - Round 3
Public Participation	**2021**
January 20 thru January 27, 2021	Online public Worksheet Two opens in mid-January 2021 - Complete
March 23 thru March 30, 2021	Online public Worksheet Three opened late March - Complete
April 12 2022	**2022** Townhall Presentation
2022 Final Plan Completion	
Spring 2022	Resilience Plan Completion

The Process

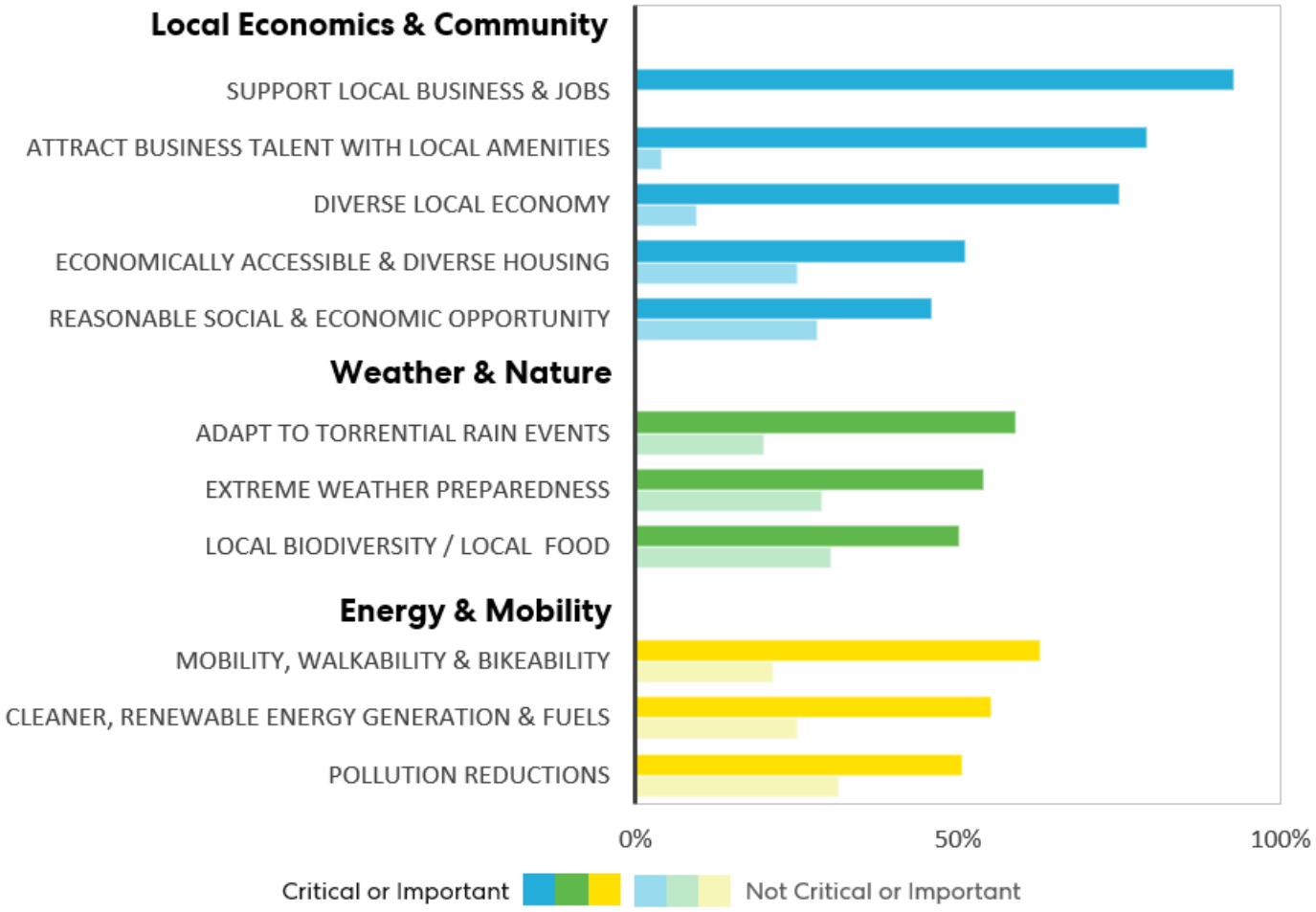
Online engagement: Increased responsiveness compared to the participation expected by an in-person only approach.

Over 1,000 points of contact across the Cedar Falls community

The planning team would like to thank everyone that participated for your engagement in the online workshops, town hall meetings, survey and worksheets.

Cedar Falls Resilience Plan Topics

Importance Identified by Community Participants



Questionnaires and worksheets: **5% to 10% margin of error** based on industry normal practices

Resilience Today

Resilience Today In Cedar Falls

Introduction

The **City of Cedar Falls, the University of Northern Iowa (UNI), and Black Hawk County** have long recognized the importance of working together to benefit the community. The following items are examples of individual and collective efforts the support the Resilience Plan.

City Efforts:

Flooding and Stormwater:

- 2010 – **Increased flood protection** elevation of new and substantially damaged structures to one foot above the 500-year flood elevation.
- The **Downtown levee height** was increased by 2 feet in 2019.
- Maintains a program to **purchase properties in the floodplain**.

Mobility:

- Since 2007, the City has installed approximately **five miles of infrastructure to support bicyclist**.
- Various **sidewalk and trail projects** have been completed or planned, such as the University **Avenue Improvement** Project and Lone Tree Road Trail.
- **Sidewalk infill projects** initiated in the Capital Improvement Program in the 1990s.

Resilience Today In Cedar Falls

City Efforts:

Environment

- Since 2016 – **300-plus trees** have been planted as part of **street improvement plans**
- Partners with Black Hawk County Soil and Water Conservation to **improve the Dry Run Creek** Watershed.
- **Annually plants 200 trees**

Waste Reduction

- **Reduces waste going into landfills** by providing remote recycling sites in the community thereby reducing the amount of fuel, material, equipment usage as compared to curbside pick-up.

Energy Reduction:

- Simple Solar, a **community solar energy** project initiated in 2016 by Cedar Falls Utilities, is currently the largest community solar project in Iowa with a total capacity of **1.5 megawatts.**

Plan Overview

Plan Execution

The Resilience Plan was funded and facilitated by the City of Cedar Falls Perkins&Will assisted in developing a synthesizing approach to community-wide resilience.

Who is responsible for executing the plan?

Some actions are the City of Cedar Falls' direct responsibility to execute.

Many actions need a diverse group of community members, businesses, and Cedar Falls organizations to be effectively pursued.

The City of Cedar Falls and CFU will identify positions to:

- Oversee and coordinate the Resilience Plan Actions.
- Facilitate a Resilience Network that connects community members, champions, stakeholders, the City of Cedar Falls, CFU.

Plan Purpose

Identify resilient actions needed as a community

The **Action Plan** starts on page 73 organized into 3 categories:

- **Local Economics & Community**
- **Weather & Nature**
- **Energy & Mobility**

Information prior to the Action Plan:
Describes each area and provides data (pages 32-75)

Local Economics & Community

Plan Drivers

- Support Local Business & Jobs
- Retain & Attract Business Talent with Local Amenities
- Maintain a Diversified Local Economy
- Provide Fair & Equitable Opportunity
- Develop Housing Options
- Maintain and improve Community Well-being

Expanding the Local Economy & Jobs

Community participants collectively agreed on (3) top resilience issues:

- Supporting local business and jobs
- Attracting business talent with local amenities
- A diverse economy

Local Economics & Community Plan Drivers
- Support Local Business & Jobs
- Retain & Attract Business Talent w/ Amenities
- Maintain a Diversified Local Economy
- Provide Fair & Equitable Opportunity
- Develop Housing Options
- Maintain and improve Community Well-being

Expanding the Local Economy & Jobs

Most businesses and talent are looking for (and need) a location that is:

- Prosperous and Stable
- Has a Competent Workforce

Competition is steep for:

- New business talent
- Aspiring entrepreneurs
- Innovators

Cedar Falls needs to provide :

- Vibrancy
- Amenities
- Diversified local economy

Cedar Falls: long and successful history of doing that, it should continue to pursue that legacy.

This requires constant vigilance and attention.

Local Economics & Community Plan Drivers

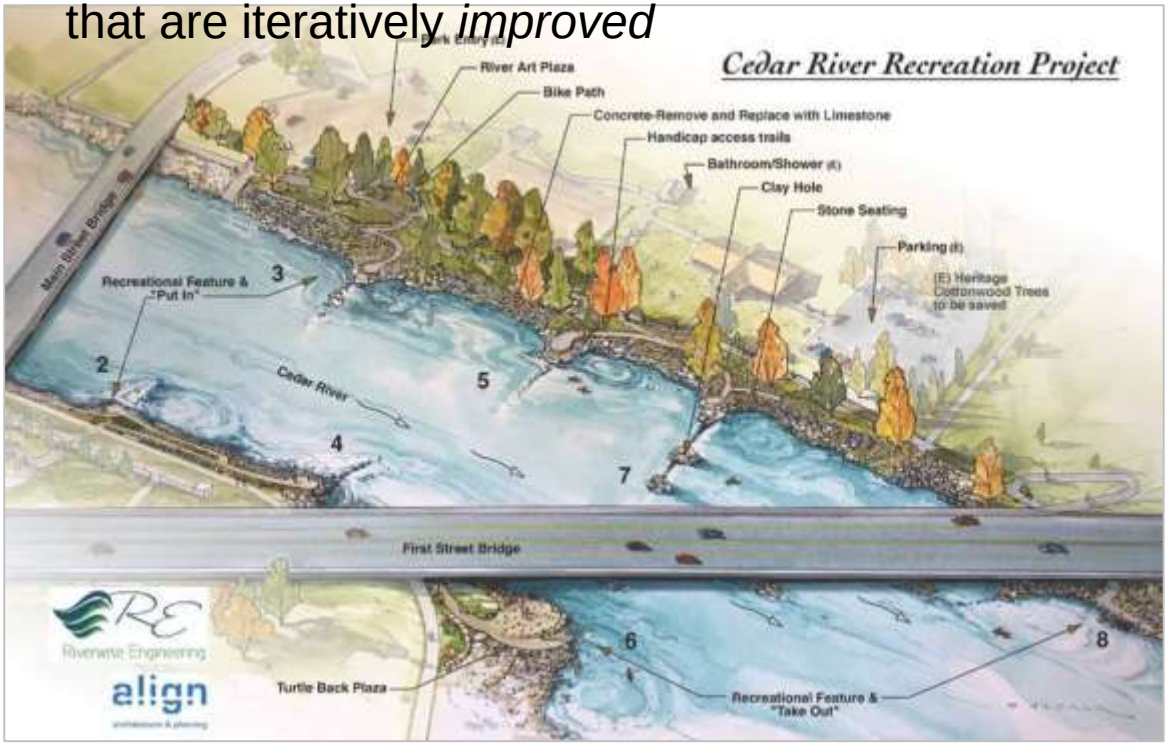
- Support Local Business & Jobs
- Retain & Attract Business Talent w/ Amenities
- Maintain a Diversified Local Economy
- Provide Fair & Equitable Opportunity
- Develop Housing Options
- Maintain and improve Community Well-being

Expanding Cedar Falls Amenities

Already have a lot to offer w/ the potential to provide more
Can be even more competitive regionally / nationally

Aside from offering the typical tax subsidies and promoting local businesses:

- **Offer amenities** that companies and business talent are pursuing
- Downtown, UNI, and very fast broadband are outstanding amenities that are iteratively *improved*



Example of a new community amenity: Cedar River Recreation Project

Expanding Cedar Falls Amenities

Leveraging Existing Opportunities

Local Economics & Community Plan Drivers
- Support Local Business & Jobs
- Retain & Attract Business Talent w/ Amenities
- Maintain a Diversified Local Economy
- Provide Fair & Equitable Opportunity
- Develop Housing Options
- Maintain and improve Community Well-being

High-value Resources within the City:
- Engaged Citizens
- Existing mixed-use areas
- Existing small waterways / green corridors
- Existing bike and Pedestrian network

City and Regional: Clean, Renewable Energy:
- Poised to be a national leader
- Local control of municipal utilities, wind power, access to biomass
- A solid signal to up-and-coming business talent

Regional: Rich agricultural lands and availability of water
- High value resources
- Weather across North America is increasingly hotter, dryer, and more extreme on the coasts - Cedar Falls a great place to locate or re-locate

Expanding amenities and leveraging existing opportunities can be done while maintaining a desirable City for the current residents of Cedar Falls

New Mixed-Use Neighborhoods

Local Economics & Community Plan Drivers
- Support Local Business & Jobs
- Retain & Attract Business Talent w/ Amenities
- Maintain a Diversified Local Economy
- Provide Fair & Equitable Opportunity
- Develop Housing Options
- Maintain and improve Community Well-being

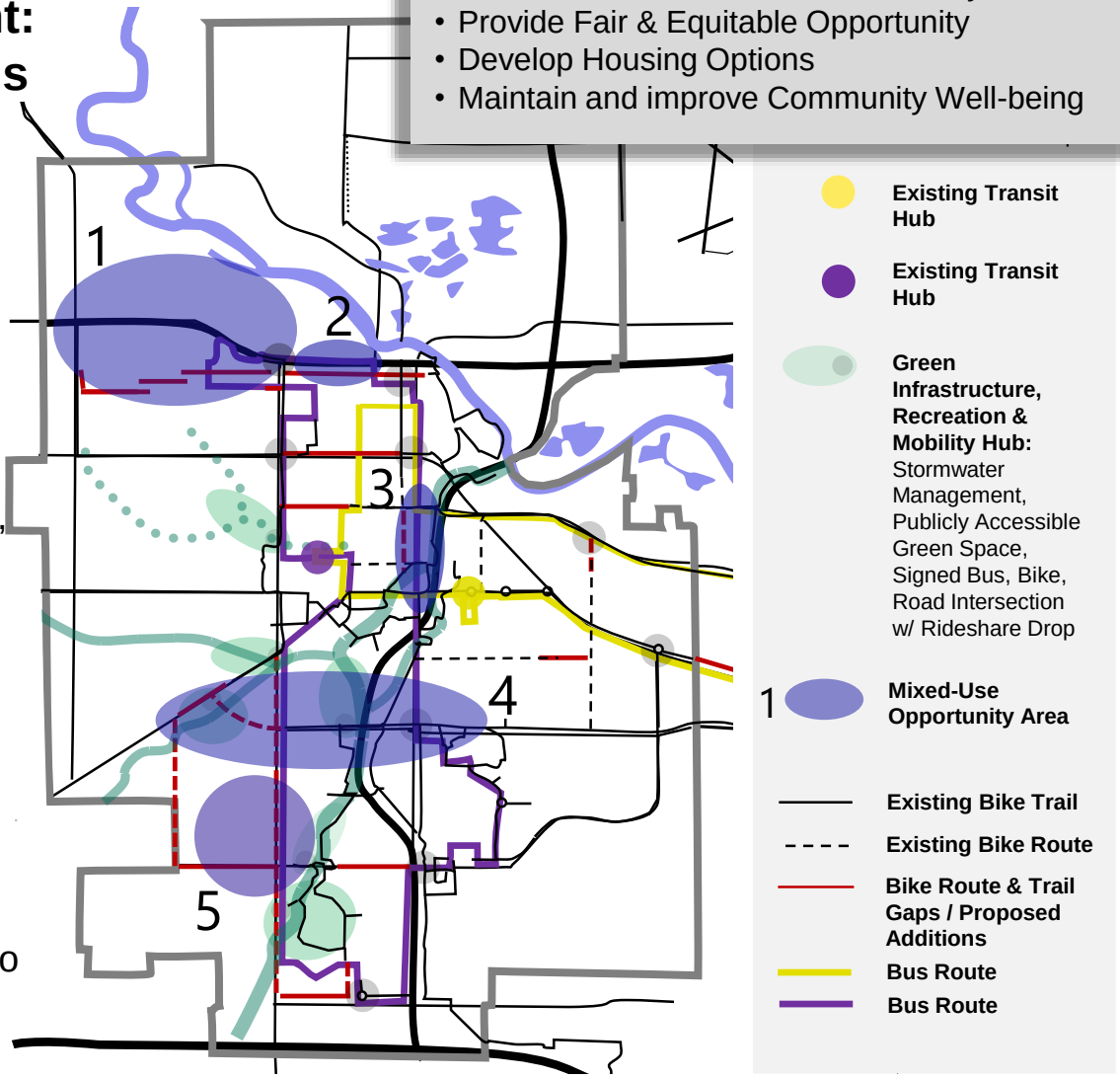
Attracting business talent: Mixed-use neighborhoods

Basics 'nearby' strong draw to business talent:
- Bikeable/walkable neighborhoods
- modestly priced 'missing middle' housing,
- local grocery w/healthy food, pharmacy, bank,
- hardware store, entertainment, employers

Five opportunities without disrupting local neighborhoods

Areas #1, #2, #4 and #5 currently mixed use – promote them

Area #3 Main Street has been re-envisioned going from four lanes to a three-lane corridor with bike lanes and wider sidewalks.



Missing Middle Housing

Local Economics & Community Plan Drivers

- Support Local Business & Jobs
- Retain & Attract Business Talent w/ Amenities
- Maintain a Diversified Local Economy
- Provide Fair & Equitable Opportunity
- Develop Housing Options
- Maintain and improve Community Well-being

Missing Middle Housing concept created by Opticos Design, Inc.
For more info visit www.missingmiddlehousing.com

Human-scale, multi-unit buildings that support bikeable, walkable neighborhoods

Time-proven / time-honored way to provide more housing choices in resilient, walkable places.

These building types, such as duplexes, fourplexes, cottage courts, and courtyard buildings, provide diverse housing options and support locally-serving retail and mobility options.

Adapted from Opticos Design founder Daniel Parolek.

Bikeable/Walkable Communities

Attracting business talent: Bikeable, walkable community

During the planning process: **Ranked 4th** on the priority list, just after a diversified economy.

Existing trail system, the Cedar Falls Bike Plan and **Pedestrian Upgrades** can create the backbone of the approach:

- Painted crosswalks, bike lanes and bike racks.
- Reduced vehicle speed.
- Traffic calming using narrower streets or intersections.
- Trees for aesthetics and shade

Local Economics & Community Plan Drivers

- Support Local Business & Jobs
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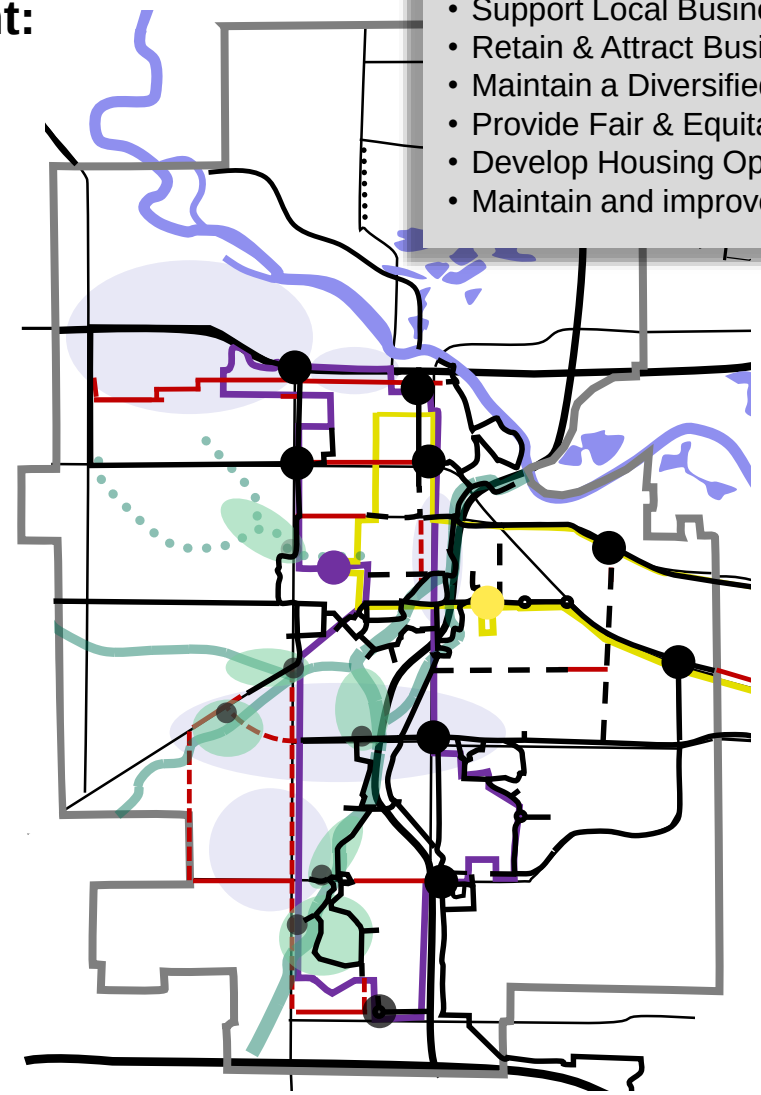


Natural Amenities

Local Economics & Community Plan Drivers
- Support Local Business & Jobs
- Retain & Attract Business Talent w/ Amenities
- Maintain a Diversified Local Economy
- Provide Fair & Equitable Opportunity
- Develop Housing Options
- Maintain and improve Community Well-being

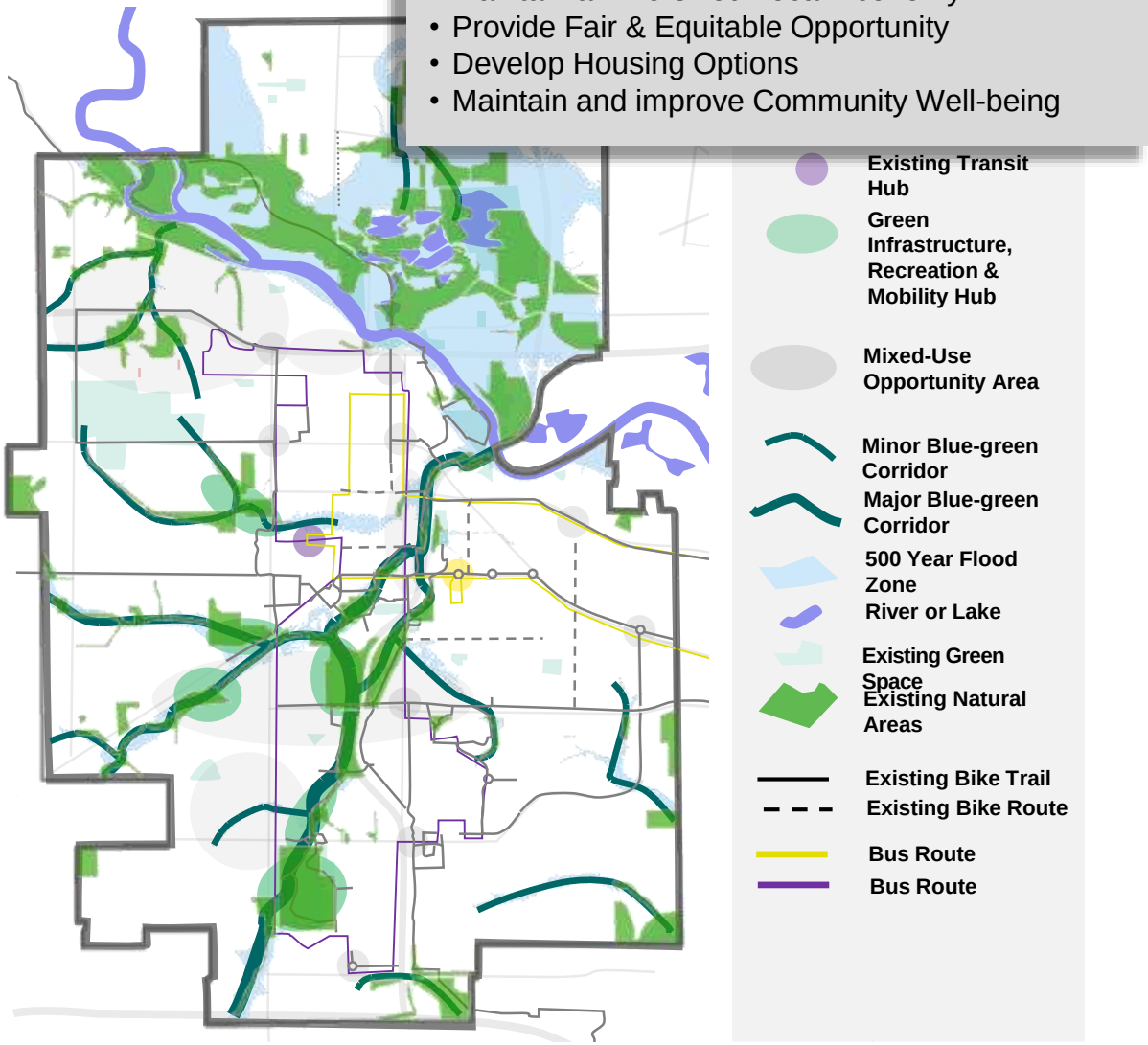
Cedar Falls has a bounty of natural resources

The streams and tributaries of the Cedar River offer substantial opportunities for multi-functional adaptation**.**

They can be extended, and stitched together improving their network to provide added
- **recreation,**
- **bike commuting,**
- **natural areas**
- **Stormwater management**

Comprised of both public and private land.

Voluntary participation by private landholders



Blue-green Corridors

"privately or publicly owned corridors primarily managed to enhance natural resources, provide recreation and mobility."

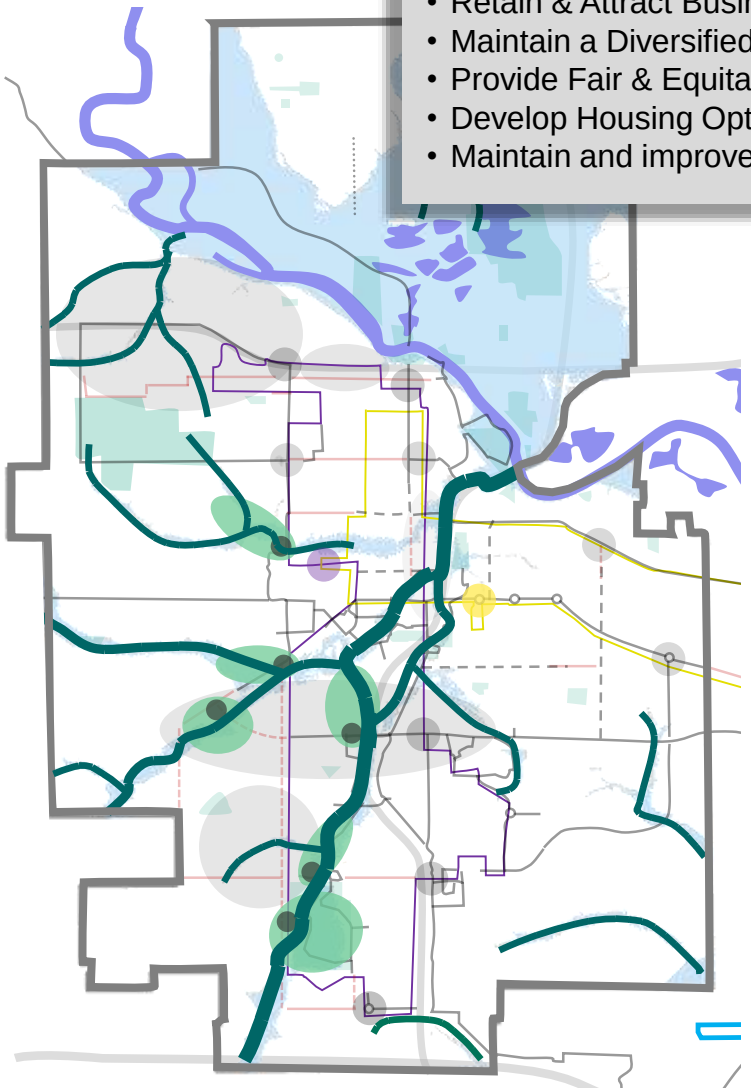
Mixed-use neighborhoods / Walkable, Bikeable Community: Genuinely robust with Blue-green Corridors

Easy access to nature, recreational biking, and relaxation.

Support Cedar Fall's Bird Friendly designation and provide habitat endangered pollinators,

Effectively **manage extreme rain** and localized flash flooding

Local Economics & Community Plan Drive
- Support Local Business & Jobs
- Retain & Attract Business Talent w/ Amenities
- Maintain a Diversified Local Economy
- Provide Fair & Equitable Opportunity
- Develop Housing Options
- Maintain and improve Community Well-being



Weather & Nature

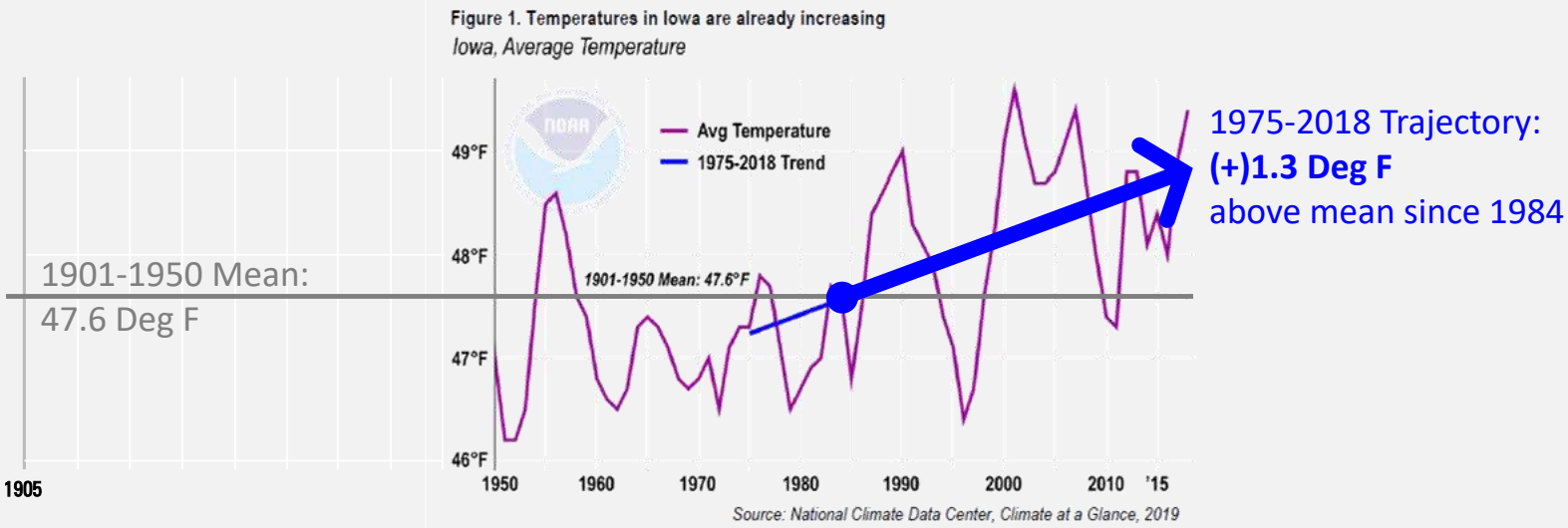
Plan Drivers

- Pursue Extreme Weather Readiness
- Pursue Extreme Rain Adaptation
- Improve Variation in Landscape Plantings & Habitat

Iowa Temperatures are Increasing

Weather & Nature Plan Drivers

- Pursue Extreme Weather Readiness
- Pursue Extreme Rain Adaptation
- Improve Variation in Landscape Plantings & Habitat



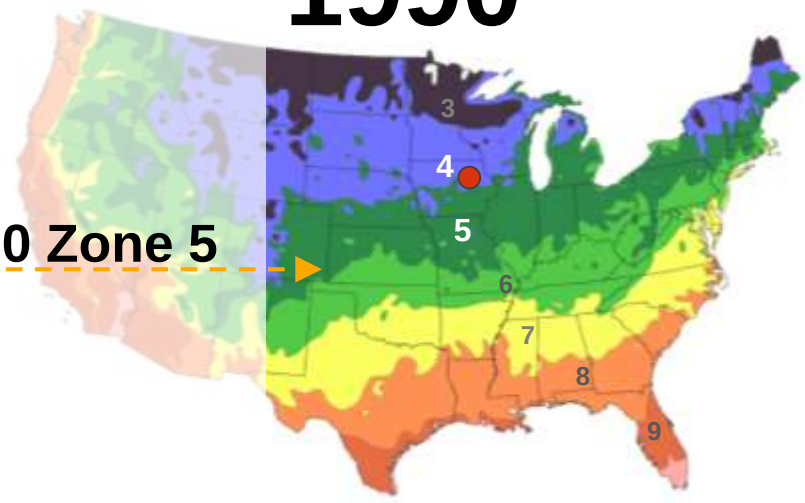
Iowa weather is warming - indications are it will continue warming

Warming increases moisture quantities in the air influencing rainfall and wind speeds

Winds, such as the August 2020 and December 2021 Derecho are accelerated by increased atmospheric energy contained in moister air. The more moisture, the more energy.

Plant Hardiness Zone Temperature Shift

1990



1990 USA Plant Hardiness Zone Map
Data source: USDA

Zones

2 3 4 5 6 7 8 9 10

Cedar Falls, Iowa

Base Maps © 2015 Arbor Day Foundation®

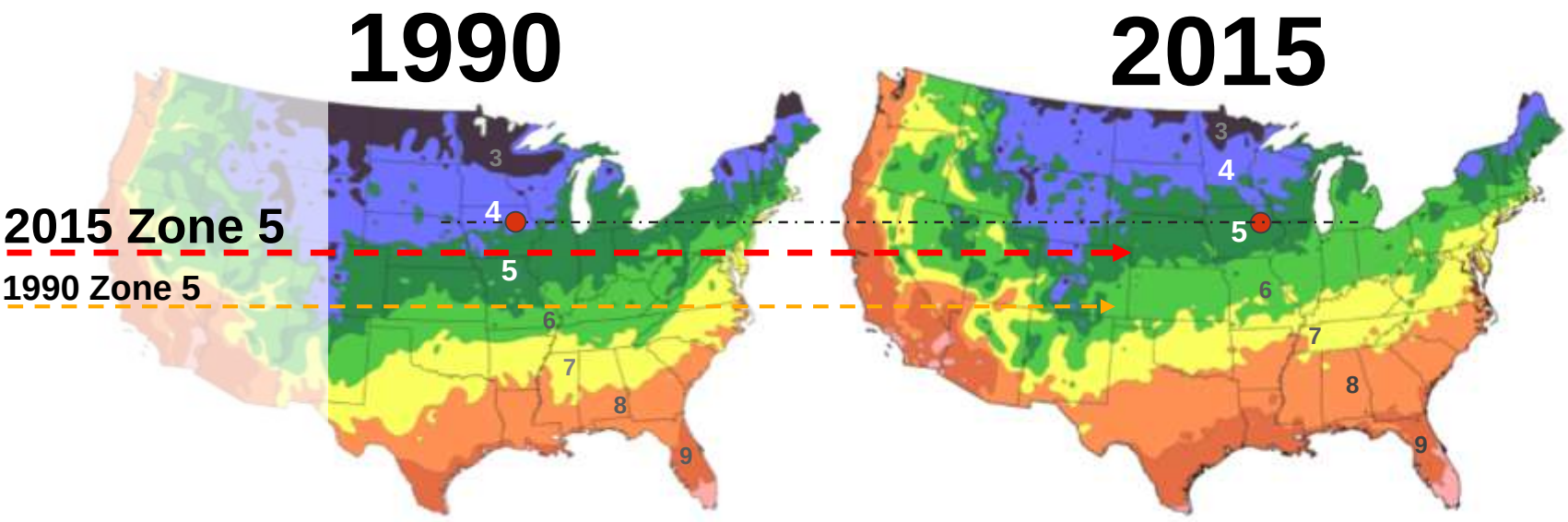
The Arbor Day Foundation Plant Hardiness Zone* base maps

Per the USDA, the shift is generally one half-zone warmer since 1990 (about 5 degrees Fahrenheit).

Weather & Nature Plan Drivers

- Pursue Extreme Weather Readiness
- Pursue Extreme Rain Adaptation
- Improve Variation in Landscape Plantings & Habitat

Plant Hardiness Zone Temperature Shift



1990 USA Plant Hardiness Zone Map
Data source: USDA

2015 USA Plant Hardiness Zone Map
Data source: NOAA

The Arbor Day Foundation Plant Hardiness Zone* base maps

Per the USDA, the shift is generally one half-zone warmer since 1990 (about 5 degrees Fahrenheit).

Weather & Nature Plan Drivers

- Pursue Extreme Weather Readiness
- Pursue Extreme Rain Adaptation
- Improve Variation in Landscape Plantings & Habitat

The Risk of Flooding

Major rain events are likely to become even more extreme as temperatures continue to rise.

Localized "urban" flash flooding is expected to continue, and the City as a whole will need to adapt.

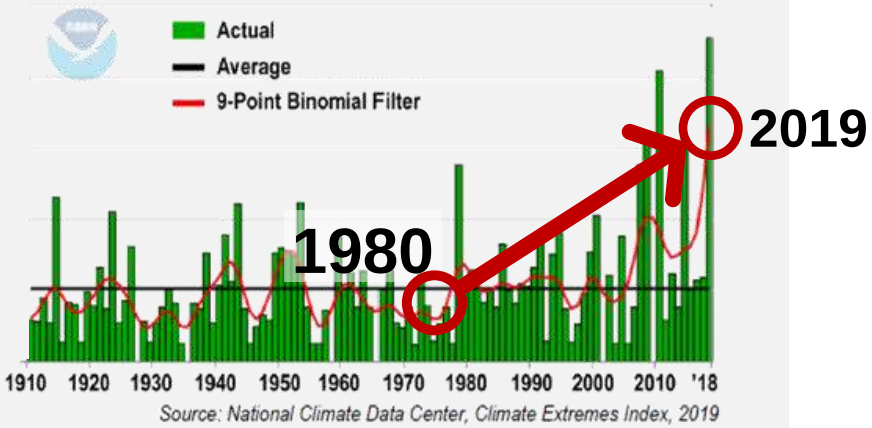
Cedar Falls: outstanding job of managing riverine flooding of the Cedar River / tributaries.

- Riverine flooding regulated: 500-year floodplain
- active buyout program

Rain Quantity During Major Rain Events

Upper-Midwest One-Day Extremes, April-September

42% Increase



Existing stormwater systems are designed to manage rainfall quantities from the past, not the new rainfall amounts

Weather & Nature Plan Drivers

- Pursue Extreme Weather Readiness
- Pursue Extreme Rain Adaptation
- Improve Variation in Landscape Plantings & Habitat

Stormwater & Extreme Rain Management

Weather & Nature Plan Drivers

- Pursue Extreme Weather Readiness
- Pursue Extreme Rain Adaptation
- Improve Variation in Landscape Plantings & Habitat

Extreme precipitation can be managed:

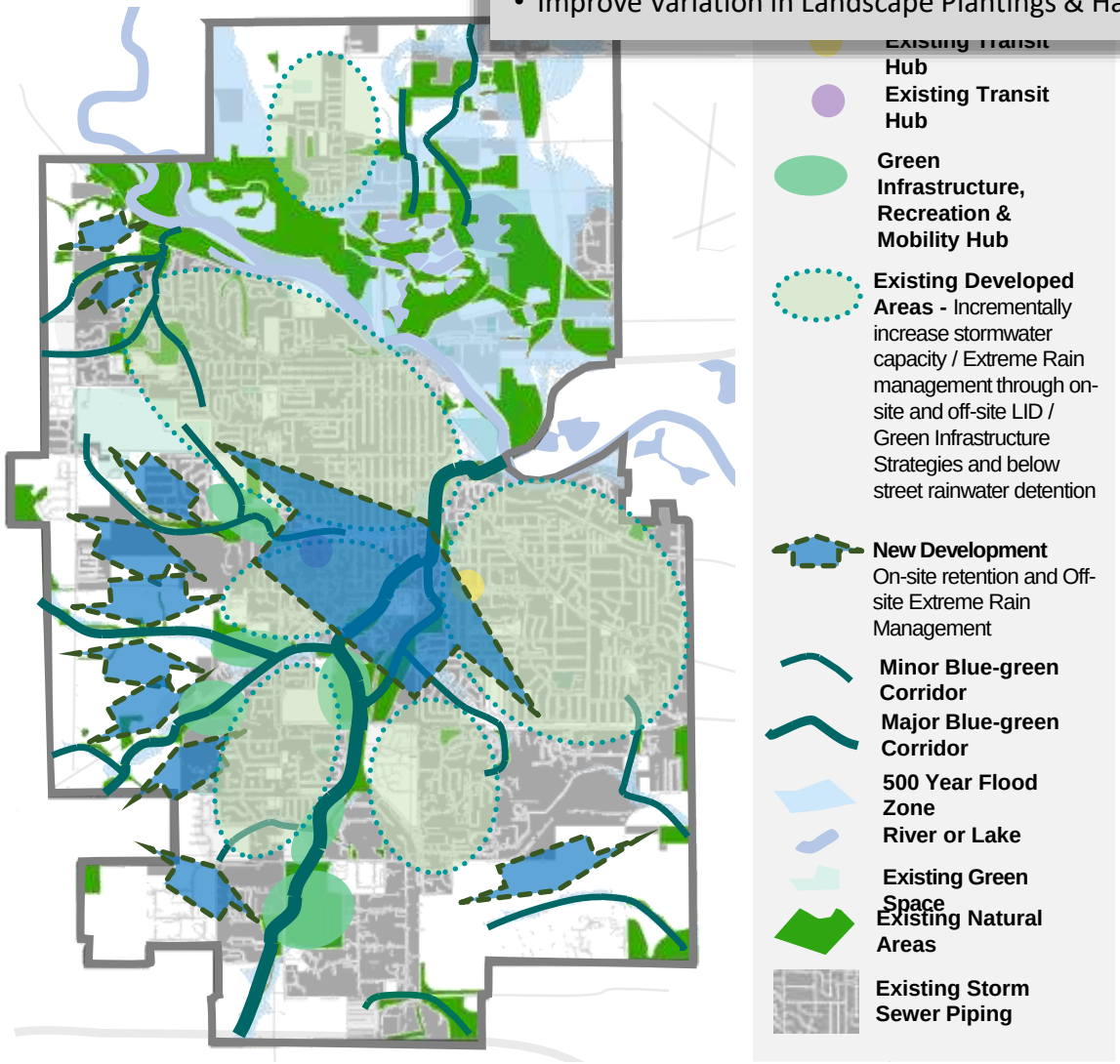
Install runoff storage at various points in the surface water network

Upstream storage may lessen downstream impacts

Downstream storage in existing developed neighborhoods may be necessary

Green Infrastructure can reduce first costs and provide natural / recreation co-benefit:

- Gray stormwater storage: $20/CF
- Green infrastructure $5 to $18



Energy & Mobility

Plan Drivers

- Pursue Diversified Renewable Energy
- Pursue Pollution and Carbon Reductions
- Improve Mobility, Walkability & Bikeability

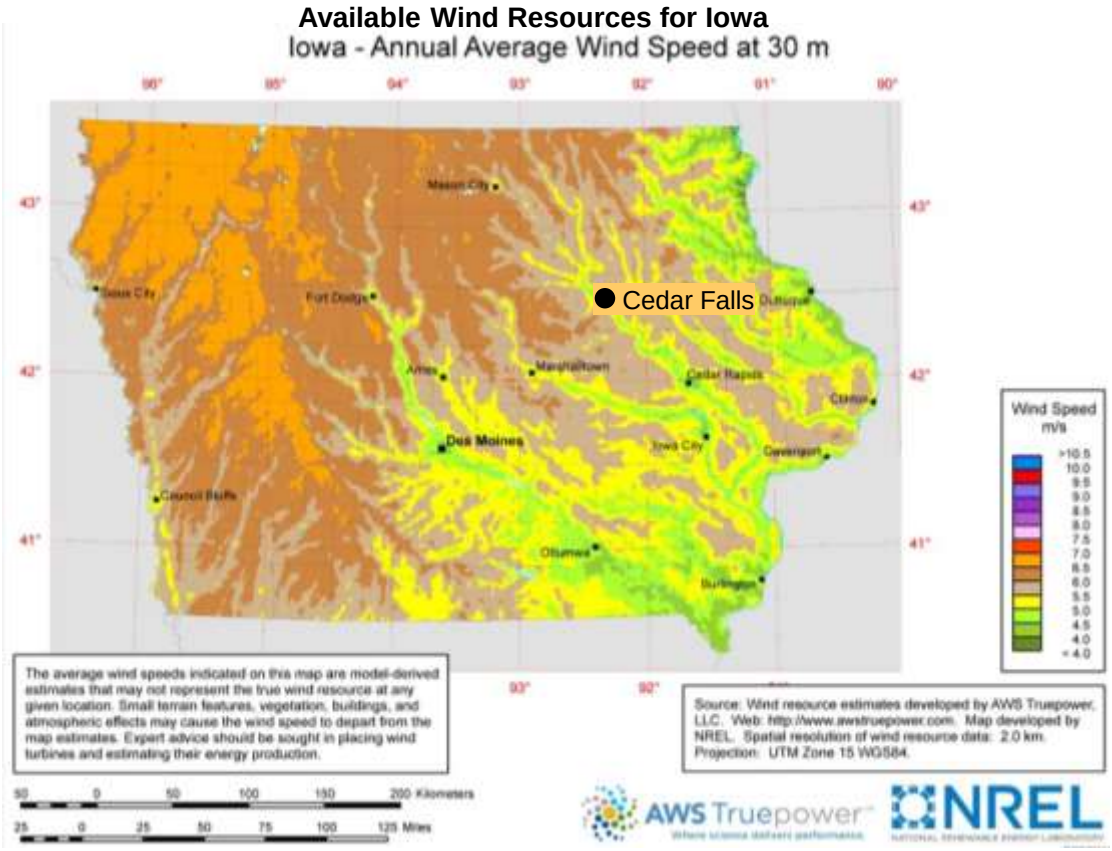
Diversified Renewable Energy

Access to energy is essential to Cedar Falls.

Cedar Falls Utilities (CFU): Low-cost, reliable electricity and natural gas

Renewable wind and solar energy have rapidly become cost-effective

Long-term energy goal for CFU:
Competitive cost structure and energy effectiveness.



1 Lazard, October 2020
https://www.lazard.com/media/451419/lazards-levelized-cost-of-energy-version-140.pdf

Energy & Mobility Plan Drivers
- Pursue Diversified Renewable Energy
- Pursue Pollution and Carbon Reductions
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Low-Cost Electricity and Fuel

All types of energy commonly receive subsidies[1]

Unsubsidized 2020 Cost of Electricity (Levelized Cost)[2]

	($/MWh)
• **Onshore Wind (Rural)**	**$26-$54**
• **Utility Scale Solar PV (Crystalline)**	**$31-$42**
• Gas Combined Cycle	$44-$73
• Coal	$65-$159
• Nuclear	$129-$198
• Gas Peaking Plant*	$151-$198

[1] U.S. Energy Information Administration, April 2018
https://www.eia.gov/analysis/requests/subsidy/

[2] Lazard, October 2020
https://www.lazard.com/media/451419/lazards-levelized-cost-of-energy-version-140.pdf

Wind power:
Lowest-cost energy source

Solar Photovoltaic (PV) :
2nd lowest-cost energy source

Energy & Mobility Plan Drivers
- Pursue Diversified Renewable Energy
- Pursue Pollution and Carbon Reductions
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**Gas Peaking Plants* operate at periods of high-demand for electricity.*

Natural Gas and Liquid Fuels

Demand reduction for natural gas and other liquid fuels:

Efficiency
Voluntary conversion to renewable electricity

- Incrementally increasing the capacity of the citywide electric grid

Direct replacement of non-renewable liquid and gas fuels with renewable versions:

- Biodiesel
- Renewable natural gas: biomethane and hydrogen
- Opportunity for using bio-reactors and biomass from native grasses.
- Native grasses can provide buffer strips for water pollution provide habitat for wildlife.

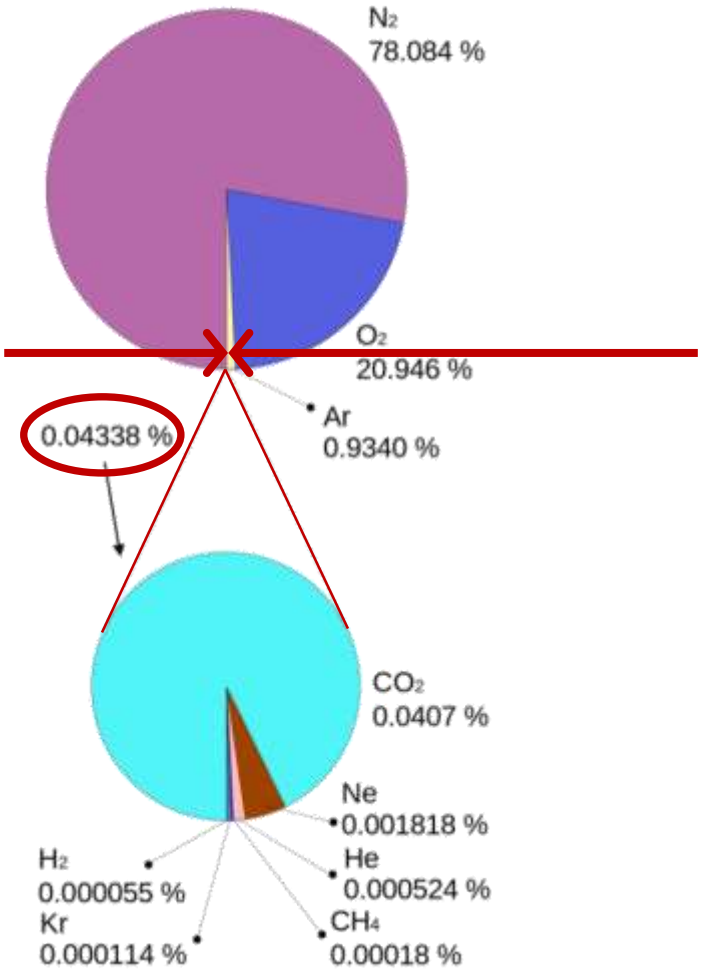
Natural Gas - Cleaner burning than Coal, but still emits Pollution

Replace with Renewable Natural Gas, Electric Appliances, Electric Heat Pumps, etc.

Energy & Mobility Plan Drivers
- Pursue Diversified Renewable Energy
- Pursue Pollution and Carbon Reductions
- Improve Mobility, Walkability & Bikeability

What's in the Air?

Energy & Mobility Plan Drivers
- Pursue Diversified Renewable Energy
- Pursue Pollution and Carbon Reductions
- Improve Mobility, Walkability & Bikeability



Non-heating trapping component comprise 99.5% of dry air (top pie chart)

Heating trapping components comprise less than ½ **of 1% of dry air** (bottom pie chart)

NASA Jet Propulsion Lab 2019
https://go.nasa.gov/2RKlJ3H

Since Industrial Revolution:
30% Increase in Heat-Trapping Gases

This creates a "pollution blanket" around the planet that traps more of the sun's energy increasing temperatures

Pollution Reduction Scenario

Energy & Mobility Plan Drivers
- Pursue Diversified Renewable Energy
- Pursue Pollution and Carbon Reductions
- Improve Mobility, Walkability & Bikeability

Community-wide pollution reductions:
Carbon Neutral Cedar Falls by 2050

CFU-provided electricity and natural gas:
- From 2010 to 2030:
- reduce CO2e by 45%,
- NOx by 63% and
- SOx by 90%.
- Carbon Neutral electricity and natural gas by 2050

Key CFU Carbon Reducing Actions:
Commercial Building Efficiency
Industrial Building Efficiency
Lower Polluting, Carbon Neutral Electricity
Lower Polluting, Carbon Neutral Heating Energy

Carbon Reduction Scenario

Energy & Mobility Plan Drivers
- Pursue Diversified Renewable Energy
- Pursue Pollution and Carbon Reductions
- Improve Mobility, Walkability & Bikeability

Pursue voluntary incremental advancement towards:

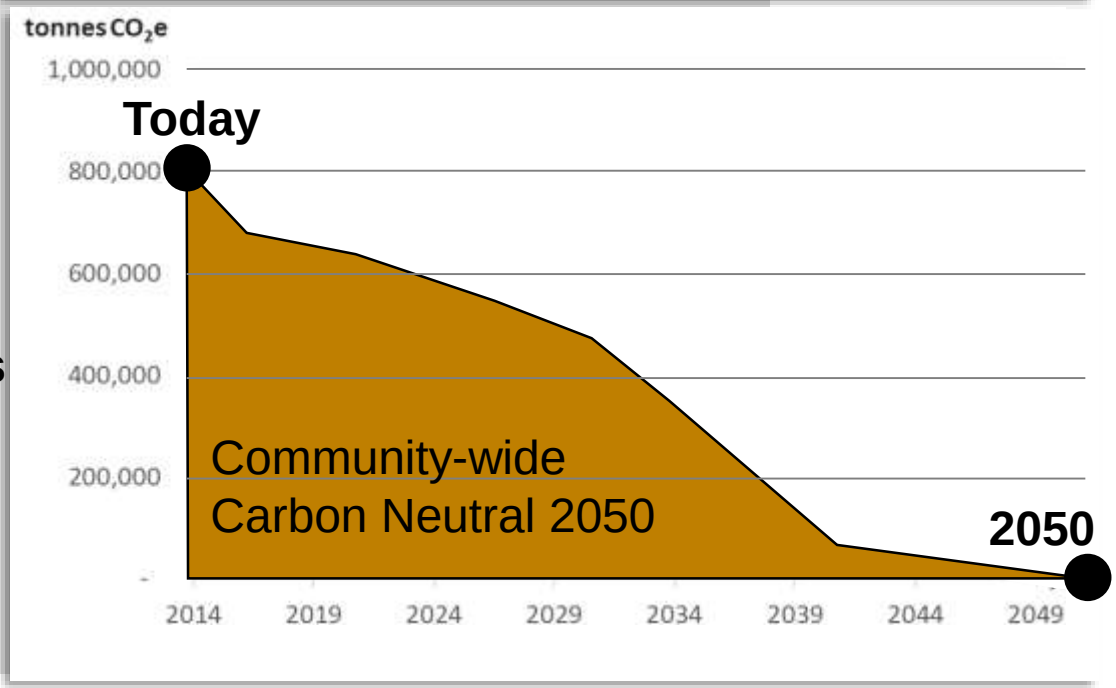
Zero Waste by 2070

Waste Reduction:
2030 2%,
2040 9%,
2050 18%

Recycling Rate:
2030 44%,
2040 72%,
2050 94%

Plastic waste reductions
Targets:
2030 15%,
2040 40%,
2050 75%

Key Community-wide Carbon Reducing Actions:
Commercial Building Efficiency
Industrial Building Efficiency
Lower Polluting, Carbon Neutral Electricity
Lower Polluting, Carbon Neutral Heating Energy
Waste Reduction and Recycling
Lower Polluting, Inclusive Mobility Options



Action Plan

Actionable Resilience Plan Components

(1) Plan Drivers
(2) Category Narratives
(3) Action List
(4) Action Plan

Using This Plan *continued*

Plan Drivers

About the Plan Drivers

Plan Drivers are based on community-wide input and define the essential qualities, outcomes and influencing factors that shape the plan.

Community Resilience is not an attribute that arises from a single element, group or institution. It is related to multiple aspects of Cedar Falls as a multi-faceted community. Everything from the built and natural environment to the social and economic fabric to individual people and businesses contributes to community resilience. As a result, the resilience plan covers a wide range of issues that is pertinent to Cedar Falls.

Three key attributes were considered in developing the Plan Drivers for Cedar Falls:

- Is the Driver significant and important to the Cedar Falls Community?
- Does the Driver play a vital role in the Community Resilience of Cedar Falls and does it support more than one Driver?
- Are there meaningful opportunities available for the Cedar Falls Community to take action in support of a Drivers' topic?

The Action List that immediately follows the Plan Drivers described here provides a summary of the identified Actions focused on each Driver. The Action Set Charts found in the three plan category sections offer additional guidance for each action. The charts also show how individual Actions support and connect with multiple Drivers.

There are many actions and measure that can be taken that support the Drivers. Not all can be included in this plan. The Plan highlights several that can have as highly impactful and offer opportunity for action. Champions for taking action include individuals, stakeholders, the City of Cedar Falls and Cedar Falls Utilities.

Local Economics + Community Category

Support Local Business + Jobs

Supporting locally owned businesses is vital to maintaining the vitality of the Cedar Falls economy. Studies show that dollars spent at locally owned businesses double their local economic impact compared to dollars spent on non-locally owned businesses. That doubling power increases the local economic activity that generates new, local jobs.

Retain + Attract Business Talent with Local Amenities

Retaining and attracting bright, motivated employees, innovators and entrepreneurs is essential to maintaining a robust, dynamic and resilient local Cedar Falls economy. When deciding where to locate and live, up-and-coming generations and businesses are motivated not only by direct economic opportunities, but by the quality of place and life making local amenities of all kinds essential to maintaining a resilient and expanding Cedar Falls economy. Encourage local start-ups and support existing local business while attracting new business to Cedar Falls with high-value local amenities.

Maintain a Mixed Local Economy

Communities with multiple types and sizes of businesses is important for weathering the ups and downs of the broader economy. If one economic sector is slow, others sectors that are remain strong can help stabilize the overall local economy.

City of Cedar Falls Resilience Plan 15

(1) Plan Drivers

Resilience Plan Drivers are the priority topics for the plan

Using This Plan *continued*


Plan Drivers

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City of Cedar Falls Resilience Plan 15

(1) Plan Drivers

Resilience Plan Drivers are the priority topics for the plan

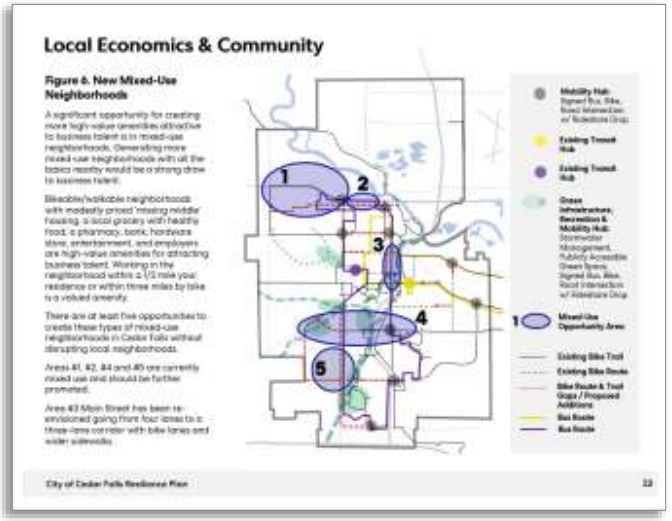

Local Economics & Community

Figure 6. New Mixed-Use Neighborhoods

A significant opportunity for creating more high-value amenities attractive to business talent is in mixed-use neighborhoods. Generating more mixed-use neighborhoods with all the basics nearby would be a strong draw to business talent.

Bikeable/walkable neighborhoods with modestly priced 'missing middle' housing, a local grocery with healthy food, a pharmacy, bank, hardware store, entertainment, and employers are high-value amenities for attracting business talent. Working in the neighborhood within a ½ mile your residence or within three miles by bike is a valued amenity.

There are at least five opportunities to create these types of mixed-use neighborhoods in Cedar Falls without disrupting local neighborhoods.

Areas #1, #2, #4 and #5 are currently mixed-use and should be further promoted.

Area #3 Main Street has been re-envisioned going from four lanes to a three-lane corridor with bike lanes and wider sidewalks.

1 2 3 4 5

Mobility Hub: Transit Bus, Bike, Road Intersection w/ Roadway Drop

Existing Transit Hub

Existing Transit Hub

Green Infrastructure, Recreation & Mobility Hub: Stormwater Management, Publicly Accessible Green Space, Signed Bus, Bike, Road Intersection w/ Roadway Drop

1 Mixed-Use Opportunity Area

Existing Bike Trail

Existing Bike Route

Bike Route & Trail Gaps / Proposed Additions

Bus Route

Bus Route

City of Cedar Falls Resilience Plan 33

(2) Category Narratives

Category Narratives describing topics and issues for each of the plans three categories

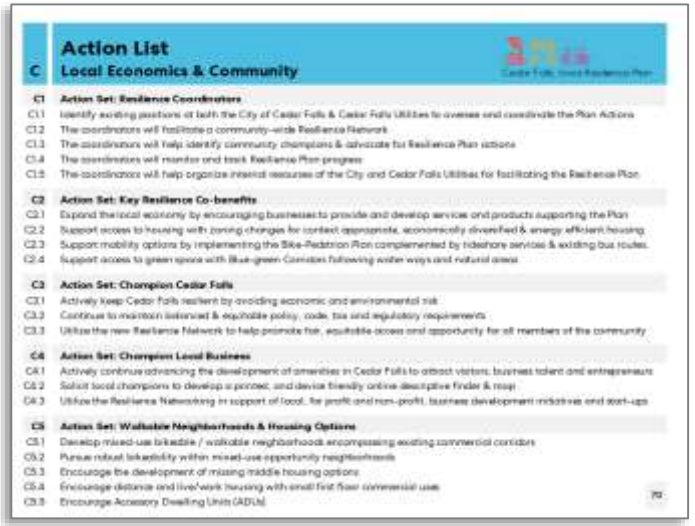
- **Local Economics & Community**
- **Weather & Nature**
- **Energy & Mobility**

Using This Plan *continued*

(3) Action List

Abbreviated version of the Action Plan

(68) Listed Actions in the Plan



Action List
C Local Economics & Community

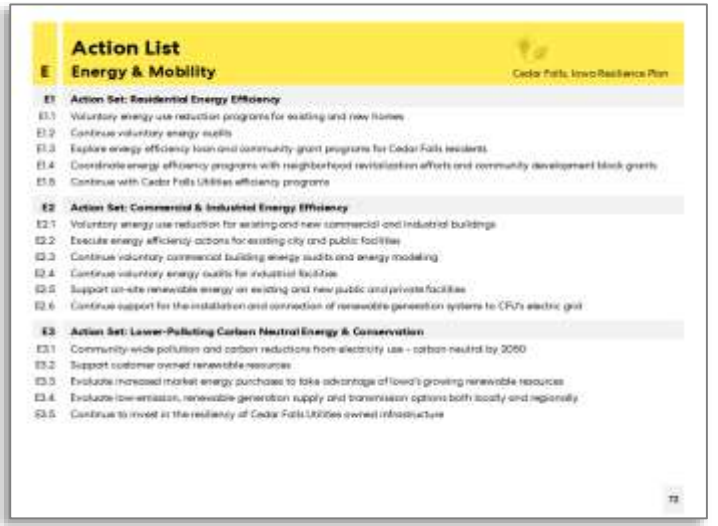
C1 Action Set: Resilience Coordinators
C1.1 Identify existing positions at both the City of Cedar Falls & Cedar Falls Utilities to oversee and coordinate the Plan Actions
C1.2 The coordinators will facilitate a community-wide Resilience Network
C1.3 The coordinators will help identify community champions & advocate for Resilience Plan actions
C1.4 The coordinators will monitor and track Resilience Plan progress
C1.5 The coordinators will help organize internal resources of the City and Cedar Falls Utilities for facilitating the Resilience Plan

C2 Action Set: Key Resilience Co-benefits
C2.1 Expand the local economy by encouraging businesses to provide and develop services and products supporting the Plan
C2.2 Support access to housing with zoning changes for context appropriate, economically diversified & energy efficient housing
C2.3 Support mobility options by implementing the Bike-Pedestrian Plan complemented by rideshare services & existing bus routes.
C2.4 Support access to green space with Blue-green Corridors following water ways and natural areas

C3 Action Set: Champion Cedar Falls
C3.1 Actively keep Cedar Falls resilient by avoiding economic and environmental risk
C3.2 Continue to maintain balanced & equitable policy, code, tax and regulatory requirements
C3.3 Utilize the new Resilience Network to help promote fair, equitable access and opportunity for all members of the community

C4 Action Set: Champion Local Business
C4.1 Actively continue advancing the development of amenities in Cedar Falls to attract visitors, business talent and entrepreneurs
C4.2 Solicit local champions to develop a process and device friendly online descriptive finder & map
C4.3 Utilize the Resilience Networking in support of local, for profit and non-profit, business development initiatives and start-ups

C5 Action Set: Walkable Neighborhoods & Housing Options
C5.1 Develop mixed-use bikeable / walkable neighborhoods encompassing existing commercial corridors
C5.2 Pursue robust bikeability within mixed-use opportunity neighborhoods
C5.3 Encourage the development of missing middle housing options
C5.4 Encourage detailed and live/work housing with small first floor commercial uses
C5.5 Encourage Accessory Dwelling Units (ADUs)



Action List
E Energy & Mobility

E1 Action Set: Residential Energy Efficiency
E1.1 Voluntary energy use reduction programs for existing and new homes
E1.2 Continue voluntary energy audits
E1.3 Explore energy efficiency loan and community grant programs for Cedar Falls residents
E1.4 Coordinate energy efficiency programs with neighborhood revitalization efforts and community development block grants
E1.5 Continue with Cedar Falls Utilities efficiency programs

E2 Action Set: Commercial & Industrial Energy Efficiency
E2.1 Voluntary energy use reduction for existing and new commercial and industrial buildings
E2.2 Execute energy efficiency actions for existing city and public facilities
E2.3 Continue voluntary commercial building energy audits and energy modeling
E2.4 Continue voluntary energy audits for industrial facilities
E2.5 Support on-site renewable energy on existing and new public and private facilities
E2.6 Continue support for the installation and connection of renewable generation systems to CFU's electric grid

E3 Action Set: Lower-Polluting Carbon Neutral Energy & Conservation
E3.1 Community-wide pollution and carbon reductions from electricity use - carbon neutral by 2050
E3.2 Support customer owned renewable resources
E3.3 Evaluate increased market energy purchases to take advantage of Iowa's growing renewable resources
E3.4 Evaluate low-emission, renewable generation supply and transmission options both locally and regionally
E3.5 Continue to invest in the resiliency of Cedar Falls Utilities owned infrastructure

Action List
W Weather & Nature

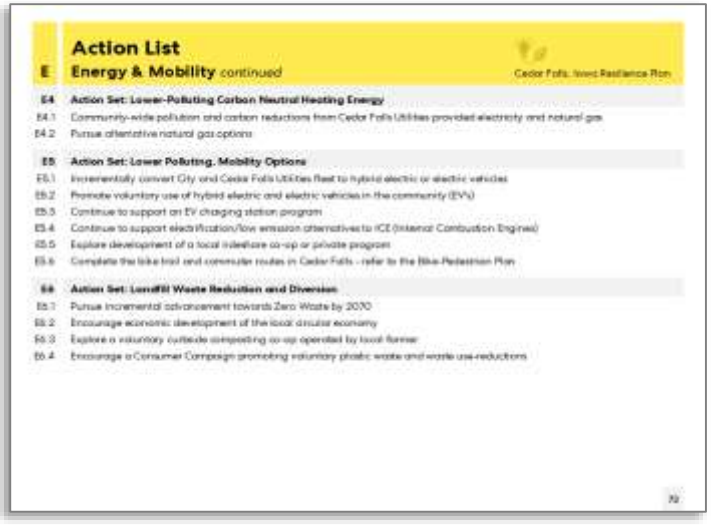
W1 Action Set: Extreme Weather Readiness
W1.1 Plan for increasingly extreme wind events from derechos, thunderstorms and tornadoes
W1.2 Plan for increasingly extreme rainfall events that bring extended torrential rains
W1.3 Plan for warming temperatures as indicated by shifting Hardiness Zones and weather data
W1.4 Explore emergency back-up energy for essential facilities and services

W2 Action Set: Blue-Green Natural Corridors: Co-Benefits
W2.1 Enhance the co-benefits of the city's waterway and green space network
W2.2 Create Blue-green corridor hubs co-locating stormwater management and outdoor recreation & mobility options
W2.3 Link corridors for natural vitality and rainwater management and biking
W2.4 Incrementally add pollinator and bird friendly native & adapted plantings and trees

W3 Action Set: Blue-Green Natural Corridors: Co-Benefits
W3.1 Increase the existing stormwater system capacity to manage new development & increasing extreme rainfall volumes
W3.2 Economically manage stormwater using a combination of site and district level approaches across Cedar Falls
W3.3 Incrementally increase available green space and stormwater capacity in already developed areas
W3.4 Reduce barriers to regional stormwater management

W4 Action Set: Extreme Rainfall Management
W4.1 During Capital Improvement Planning, perform an urban flash flooding risk screen
W4.2 Proactively improve extreme rainfall resilience
W4.3 Manage extreme rain stormwater flows upstream from already developed neighborhoods

W5 Action Set: Beneficial Yardscapes + Landscapes
W5.1 Use a variety of native & adapted plantings and trees for residential and commercial yards and public landscapes
W5.2 Increase pollinator and bird habitat using native and adapted plantings
W5.3 Plan for a an ongoing shift in the Hardiness Growing Zone
W5.4 Encourage rainwater harvesting for irrigation and habitat areas
W5.5 Reduce the use of pesticides and herbicides by growing native & adapted plants



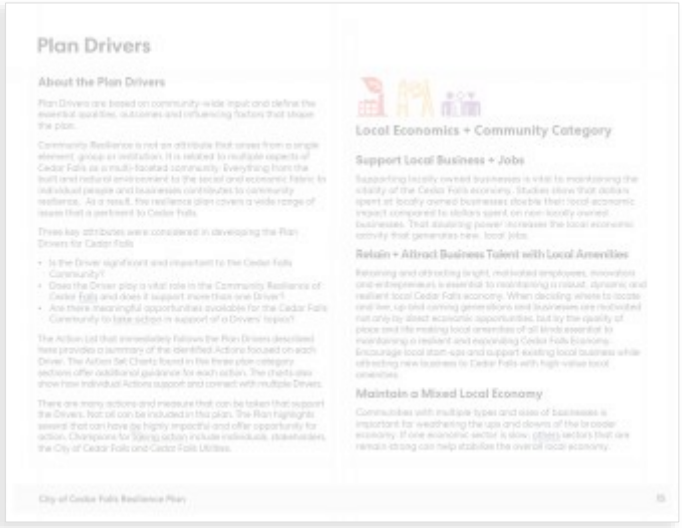
Action List
E Energy & Mobility *continued*

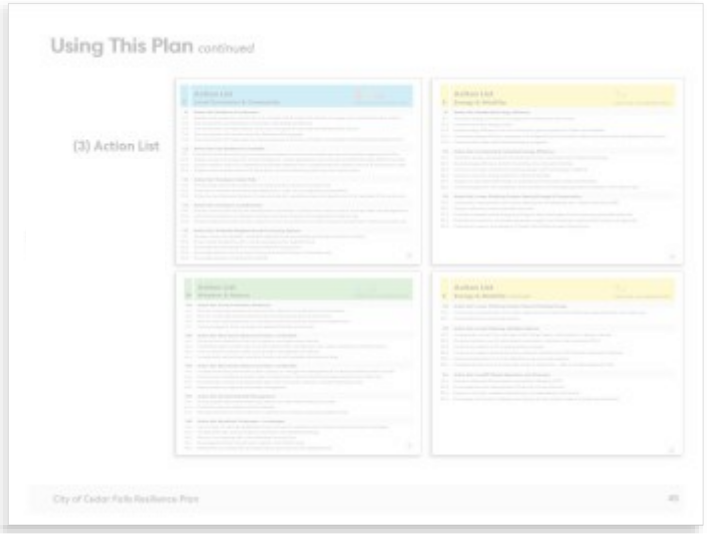
E4 Action Set: Lower-Polluting Carbon Neutral Heating Energy
E4.1 Community-wide pollution and carbon reductions from Cedar Falls Utilities provided electricity and natural gas
E4.2 Pursue alternative natural gas options

E5 Action Set: Lower Polluting, Mobility Options
E5.1 Incrementally convert City and Cedar Falls Utilities fleet to hybrid electric or electric vehicles
E5.2 Promote voluntary use of hybrid electric and electric vehicles in the community (EVs)
E5.3 Continue to support an EV charging station program
E5.4 Continue to support electrification/low emission alternatives to ICE (Internal Combustion Engines)
E5.5 Explore development of a local rideshare co-op or private program
E5.6 Complete the bike trail and commuter routes in Cedar Falls - refer to the Bike-Pedestrian Plan

E6 Action Set: Landfill Waste Reduction and Diversion
E6.1 Pursue incremental advancement towards Zero Waste by 2070
E6.2 Encourage economic development of the local circular economy
E6.3 Explore a voluntary curbside composting co-op operated by local farmer
E6.4 Encourage a Consumer Campaign promoting voluntary plastic waste and waste use-reductions

Using This Plan *continued*





(4) Action Plan

The Action Plan is the *core* of the Resilience Plan

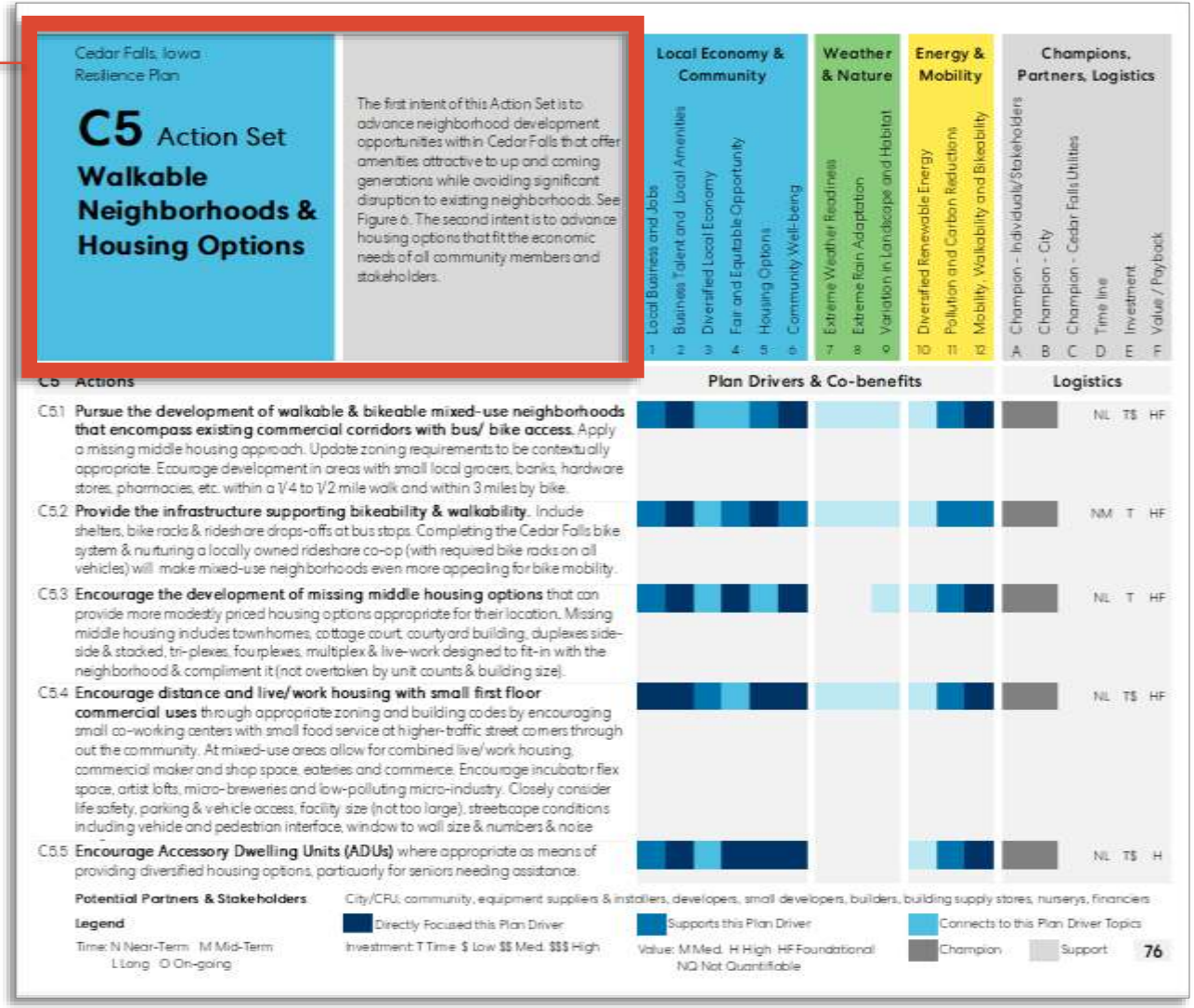
Describes specific measures to be taken for improving the resilience of the Cedar Falls Community

Connects Actions, Drivers, Champions, Resource Requirements, Timeline

Using the Action Plan

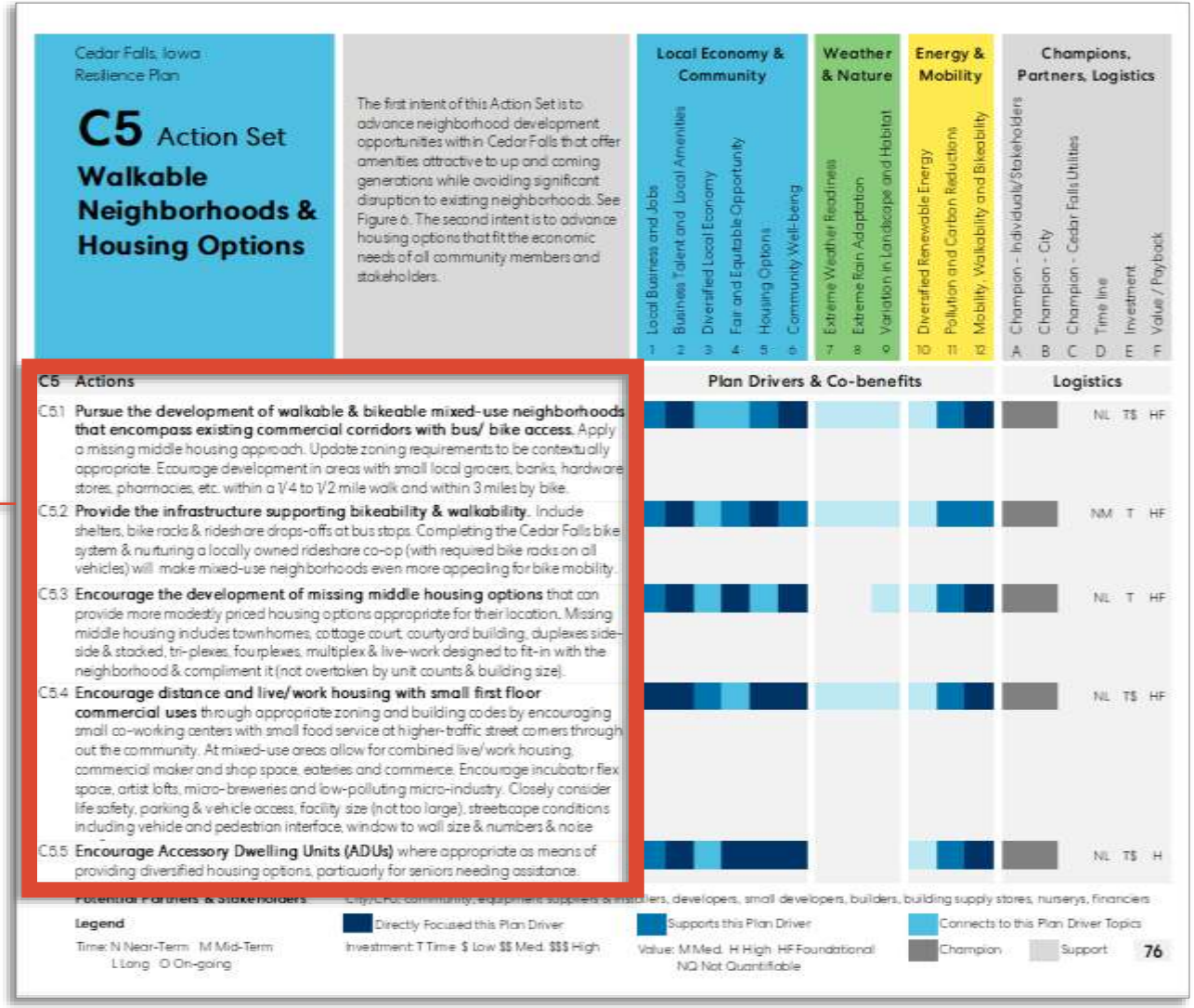
Action Set Description
Name, Number and Intent

(16) Action Sets



Using the Action Plan *continued*

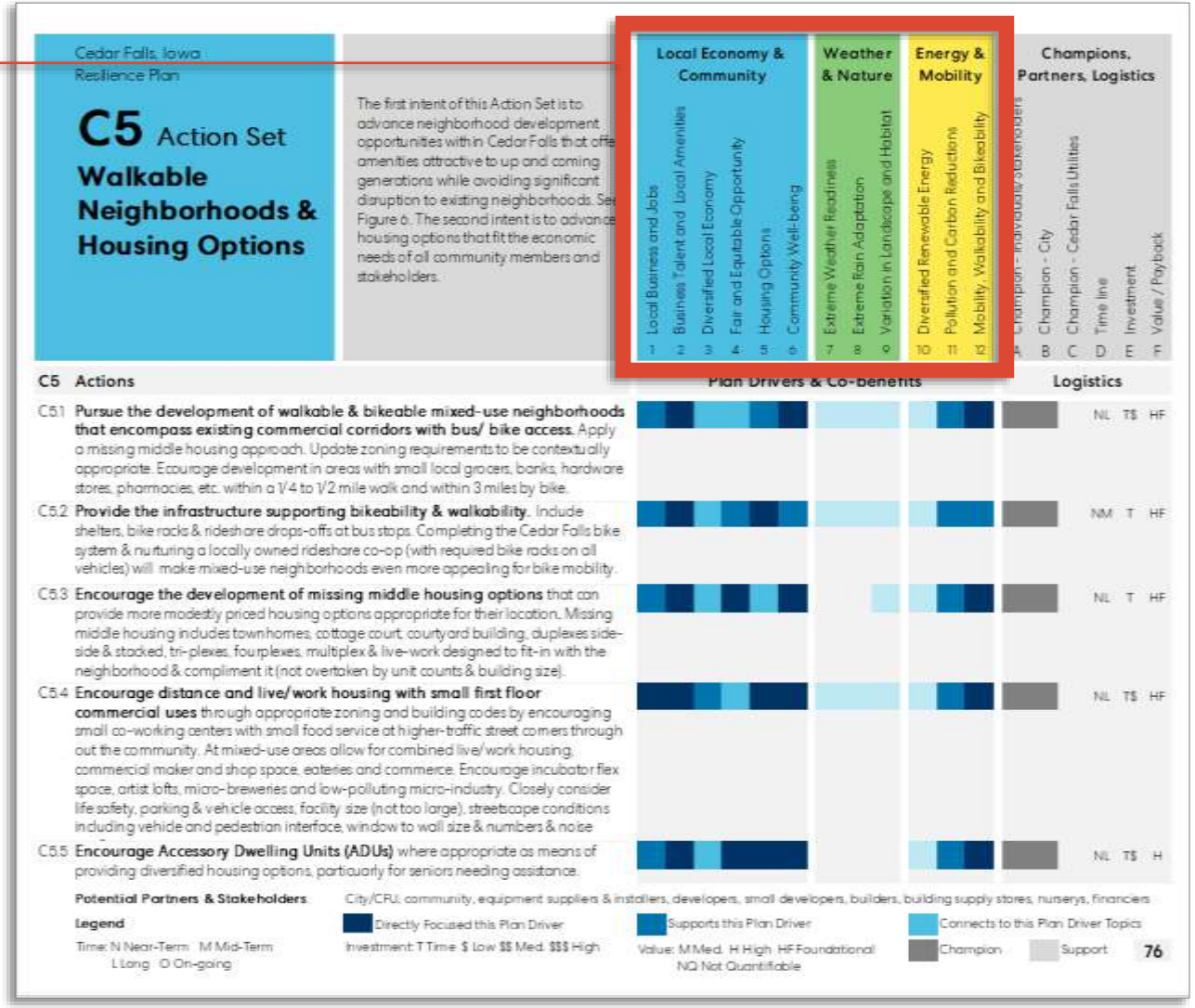
Individual Actions
Strategies, Approaches, Metrics



Using the Action Plan *continued*

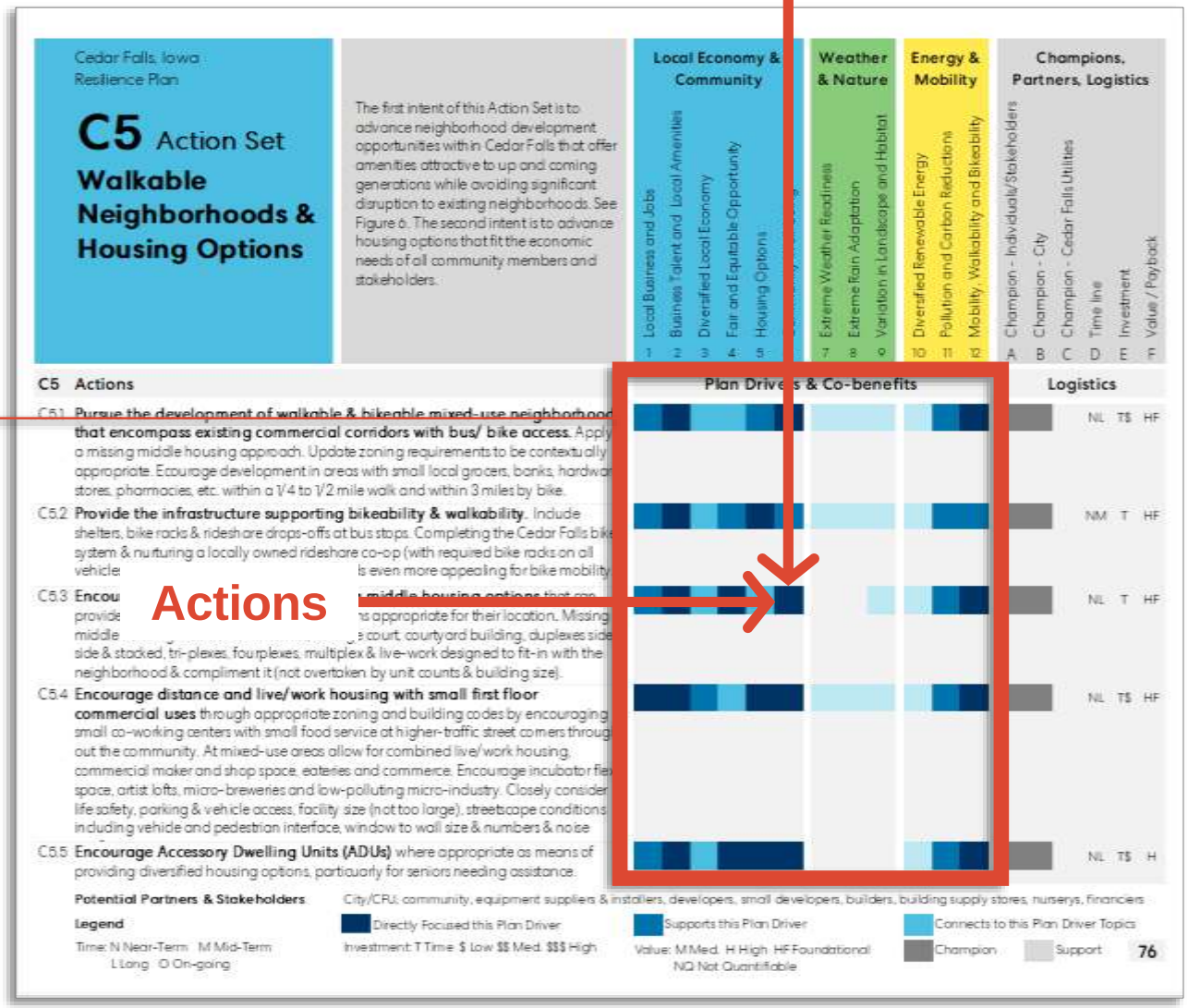
Plan Drivers

Essential qualities, outcomes and influencing factors that shape the plan



Using the Action Plan *continued*

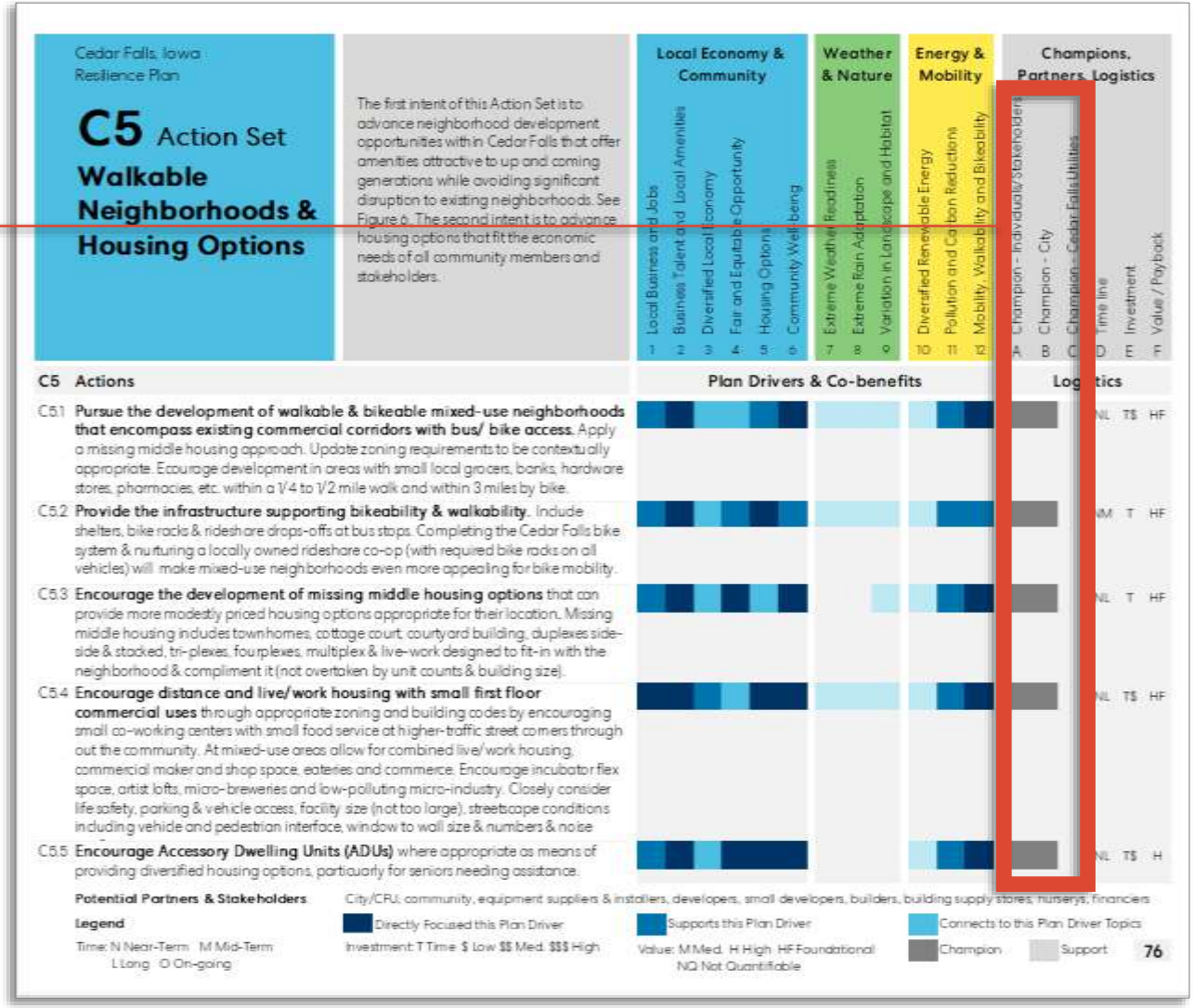
Co-benefits
Identifies the benefits of a single action across multiple Plan Drivers (Goals)



Using the Action Plan *continued*

Champions

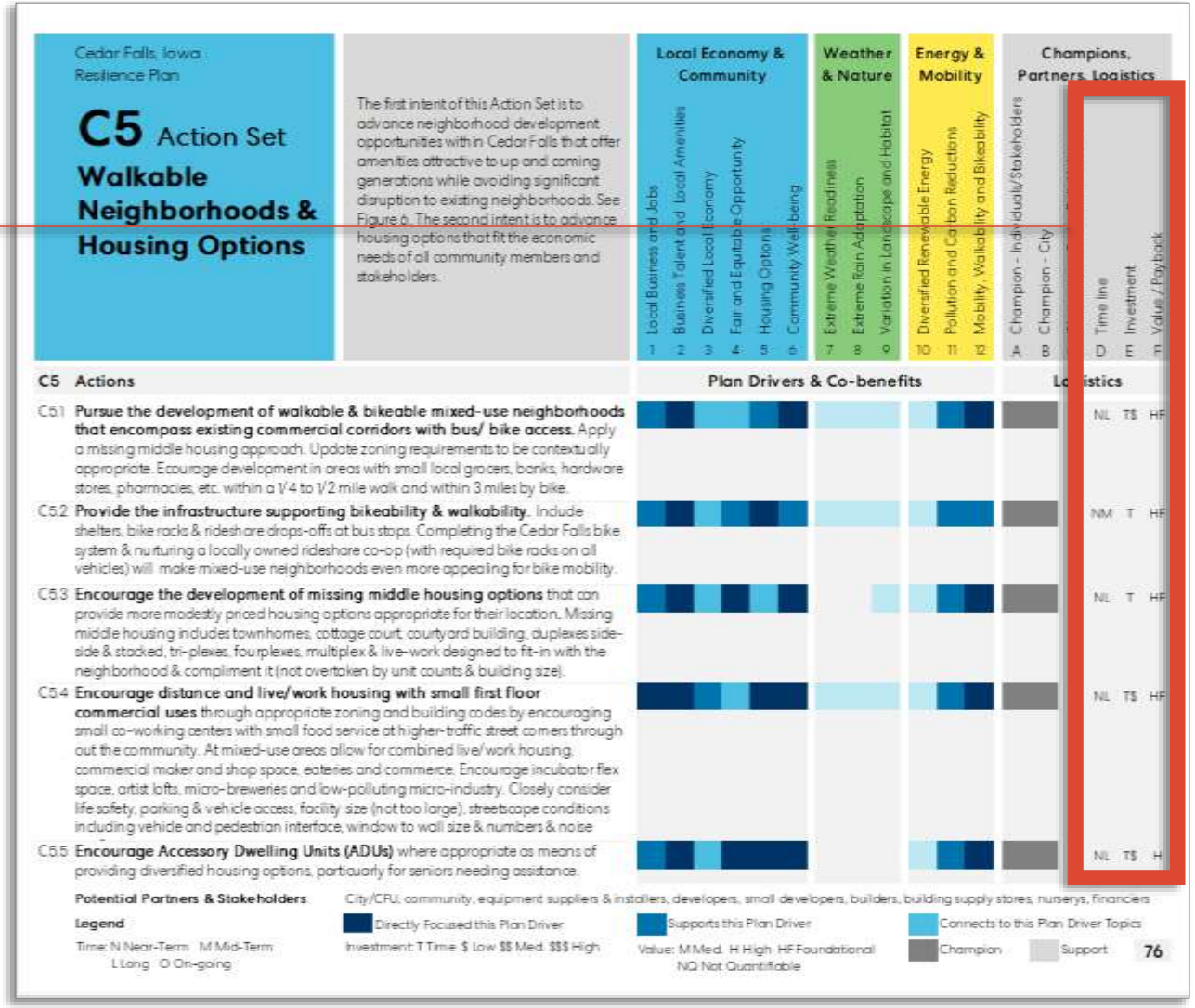
- Individuals
- Businesses,
- Organizations
- Institutions
- City of Cedar Falls
- Cedar Falls Utilities



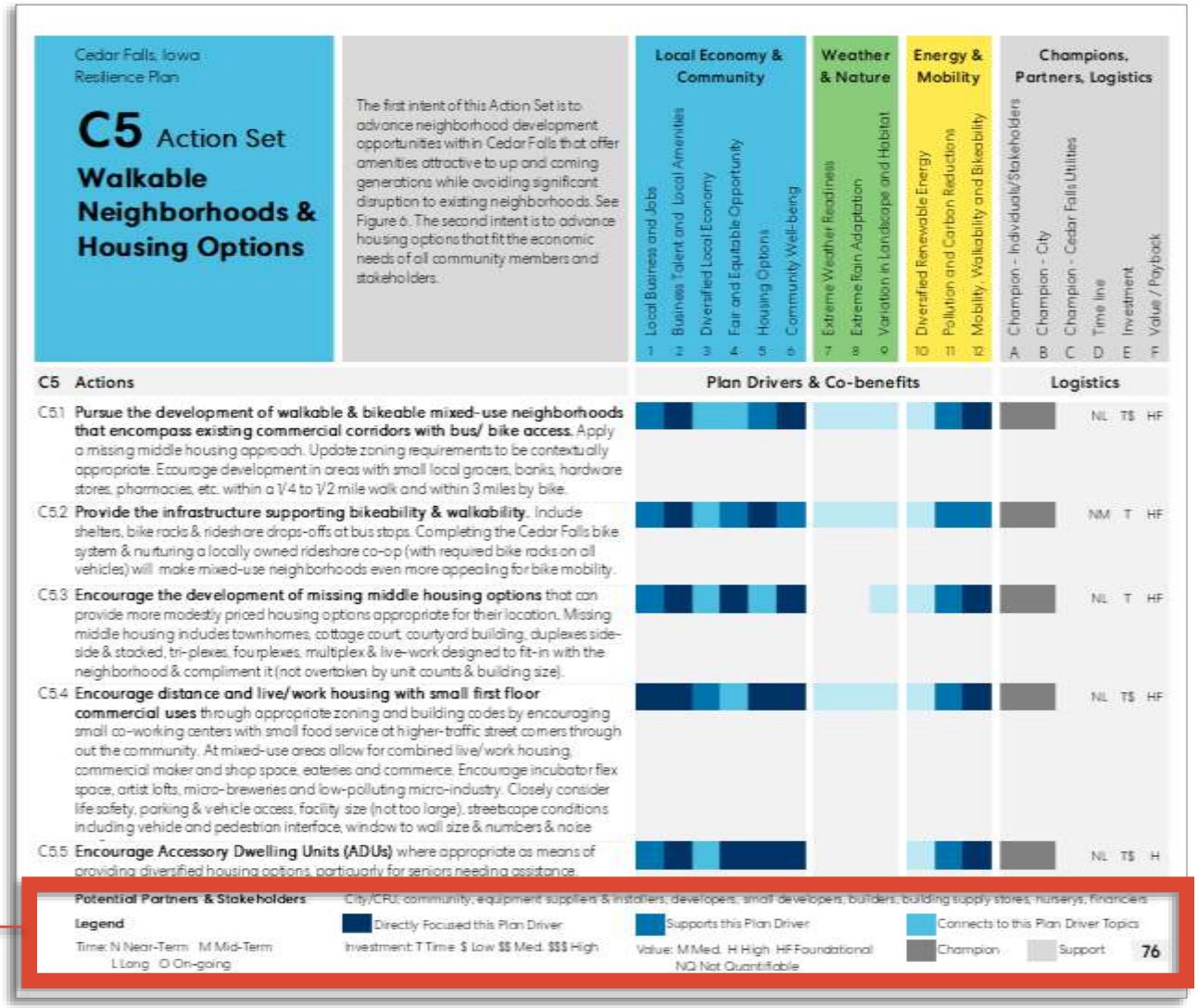
Using the Action Plan *continued*

Logistics

- Timelines
- Investment ($)
- Value / Payback



Using the Action Plan *continued*



Legend

Next Steps

- **Receive and File**
- **Adopt**

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Questions?